



The Berar General Education Society's
**Shri Radhakisan Laxminarayan Toshniwal
College of Science, Akola (M.S.)
(Shri R.L.T. College of Science)**

Recognized by Government of Maharashtra
Affiliated to Sant Gadge Baba Amravati University, Amravati
Re-accredited 'A' by NAAC, Bangalore with CGPA-3.12



4th Cycle of NAAC ASSESSMENT AND ACCREDITATION

CRITERION - III RESEARCH, INNOVATIONS AND EXTENSION

Key Indicator - 3.3 Research Publications and Awards

3.3.1 QnM

**Number of research papers published per teacher
in the journals notified on UGC care list during
the last five years**

CRITERION - III : RESEARCH, INNOVATIONS AND EXTENSION



The Berar General Education Society's Akola
SHRI RADHAKISAN LAXMINARAYAN TOSHNIWAL COLLEGE OF SCIENCE

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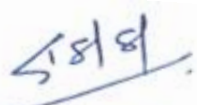
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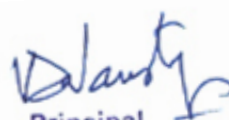
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DECLARATION

This is to declare that, the information, data, true copies of the supporting documents etc. furnished in this file is checked and verified by IQAC, Shri R.L.T. College of Science, Akola and found to be correct.


Dr. R. L. Rahatgaonkar
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3.3.1.1 - Number of research papers in the journals notified on UGC CARE year wise during the last five years

Year	2017-18	2018-19	2019-20	2020-21	2021-22
Number	51	47	73	24	39

A study of Aerobic Endurance among Judo Players and Wrestlers of Akola City

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Abstract

Aerobic endurance is part of our life even if we are not aware of it. In any sports you are not able to implement sport skills properly at the time of competition or practice schedule without aerobic endurance. Aerobic endurance is one of the main fitness components. Judo is such a dynamic and combative sport. Some judo players are all about speed so the fight is based around aerobic fitness while others are slow and all strength so the fight then spills over into the anaerobic category. Wrestling is one of the ancient sports in world. Wrestling is a dynamic, high-intensity and combative sport. Wrestlers need very high levels of complex skills, tactical excellence and physical fitness to success on the world stage. The main purpose of the present study was to find out the Aerobic Endurance between Male Judo Players and Wrestlers of Akola City. It was hypothesized that there may be significant difference in the Aerobic Endurance between Male Judo Players and Wrestlers of Akola City. 20 Judo players and 20 Wrestlers of Akola city who had participated in University Level Tournaments were taken as subjects in the age group between 20 to 25 years at random. 12 Minutes Cooper Test is used for collection data. Running distance was measured in meter. For comparison of aerobic endurance of Judo Players & Wrestlers 't' test was used. As the above table Judo Players mean performance is 2211 meters and Wrestlers mean performance is 2152 meters. There is mean difference of 59 between Judo Players and Wrestlers. The calculated t-value of 1.055 is not more than the tabulated t- value of 1.685 at 0.05 level of significance of 38 degree freedom. Hypothesis was rejected on the basis of statistical analysis. It is concluded that there is no significant difference found in performance of aerobic endurance of Judo players and Wrestlers of Akola City

KEYWORDS: Aerobic Endurance, Judo Players, Wrestlers, Akola City, Cooper Test

Introduction

Aerobic endurance is part of our life even if we are not aware of it. After exercise you will be in struggling to control your breathing. This struggle shows your endurance or stamina of your body. This type of level and indicators shows that how healthy you are. Oxygen consumption rate varies with age, gender and activities. Oxygen consumption is highest when you are in your age 20s. The level of oxygen consumption in your body plays a key role in aerobic endurance. Your Body's ability to supply necessary oxygen and energy during any physical activity defines aerobic endurance. In any sports you are not able to implement sport skills properly at the time of competition or practice schedule without aerobic endurance. Aerobic endurance is one of the main fitness components.

Players of various require endurance, strength, power, speed, agility, flexibility, nerve, durability, hand-eye coordination and analytic aptitude.

Judo is such a dynamic and combative sport. It requires very hard training for one certain component. For this purpose judo players need a lot of different styles of fitness covering all energy systems. Some judo players are all about speed so the fight




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**A COMPARATIVE STUDY OF UPPER BODY STRENGTH
AMONG JUDO PLAYERS AND WRESTLERS OF AKOLA
CITY.**

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ABSTRACT :

All types of sports activities required overall physical fitness of players to perform his sport skills at maximum level. Having a strong upper body improves your flexibility, mobility and range of motion. Upper body strength is important for Judo players. Maximum Judo's Upper techniques require upper body strength to apply throwing techniques effectively. In ground techniques of Judo upper body strength is very much useful for taking hold on opponent. Upper body strength is also useful for hand locks and choking of opponent. Upper body strength is most important for Wrestlers because wrestlers have to grip opponent's body parts in sweating condition without any equipment related support to use techniques. The main purpose of this comparative study is to find out the Upper Body Strength between Male Judo Players and Wrestlers of Akola City. It was hypothesized that there may be significant difference in the Upper Body Strength between Male Judo Players and Wrestlers of Akola City. 20 Judo players and 20 Wrestlers of Akola city who had participated in School Level Tournaments were taken as subjects in the age group between 15 to 18 years at random. The pull up test (also called the chin-up test) is widely used as a measure of upper body strength. The total number of correctly completed pull-ups is recorded in count in one time. Statistical analysis show that Judo Players mean performance is 10.50 counts and Wrestlers mean performance is 11.70 counts. There is significant difference related Upper Body Strength among Judo players and Wrestlers of Akola city because the calculated t-value of 1.958 is more than the tabulated t-value of 1.685 at 0.05 level of significance of 38 degree freedom. Hypothesis was accepted and it is concluded that there is significant difference found in Upper Body Strength of Judo players and Wrestlers of Akola city.


KEYWORDS : Upper Body Strength, Judo Players, Wrestlers, Akola City,

EXTROVERSION:

Upper body strength is important for every player because the upper body controls your ability to perform everyday activities such as reaching, pulling, pushing and lifting. Five major parts of the upper body, namely, the chest, shoulders, triceps, biceps and the back. Your upper body is grouped into muscles with specific functions. You have muscles of your hands, forearms, upper arm and shoulder. Having a strong upper body improves your flexibility, mobility and range of motion. All types of sports activities required overall physical fitness of players to perform his sport skills at maximum level.

Judo is such a dynamic and combative sport. It requires very hard training for one certain component. For this purpose judo players need a lot of different styles of fitness covering all energy systems. Upper body strength is important for Judo players. Various skill of Judo is basically divided into two parts that is upper

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POTENTIAL MOSQUITOCIDE PHYTOEXTRACT OF *PARTHENIUM HYSTEROPHOROUS* (CONGRESS GRASS) WEED PLANT

SUSHIL M. NAGRALE

Shri R.L.T College of Science, Akola (M.S.), India

Accepted Date: 05/09/2017; Published Date: 10/10/2017

Abstract: The phyto-chemical analysis of weed plant *Parthenium hysterophorus* has indicated that all the plants parts contain toxins called sesquiterpene lactones. The major components of toxic being parthenin and other phenolic acids such as caffeic acid, vanillic acid, ansic acid are reported to have mosquitocidal properties. *Parthenium* samples were collected from local area and field area were air dried in the laboratory. The plant material was extracted in alcohol (methanol), petroleum ether and ethanol. The crude extracts were dissolved in acetone (6% w/v) to make stock solution. Results on application of phyto- extract on larvae and adults mosquitoes was shown mosquitocidal properties.

Keywords: *Parthenium hysterophorus*, larvicide, adulticide, Aedes, Culex.



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INSILICO ANALYSIS AND HOMOLGY MODELLING OF TBC1D3 PROTEIN

PALLAVI KASHIKAR, S. M. NAGRALE

Department of Bioinformatics, Shri RLT College of Science Akola, Maharashtra, India

Accepted Date: 05/09/2017; Published Date: 10/10/2017

Abstract: Type 2 diabetes is the most common form of diabetes. In type 2 diabetes body does not use insulin properly. TBC1D3 protein is able to maintain the insulin pathway open so that the cells still take up glucose. In the current study structure analysis of TBC1D3 protein was done by using protparam, GOR IV tools. This gives the primary & secondary structure analysis of the protein. The structure was modelled with Swiss prot sever and validate with PSVS.

Keywords: Diabetes2, Homology modelling, structure prediction, Insilico analysis



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DEVELOPMENTAL VARIATION OF INSECT ELAPHROTHRIPS PROCER (SCHMUTZ) (THYSANOPTERA: PHLAEOTHIRIPIDAE)

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Abstract

Detailed study of insect *Elaphrothrips procer* (Schmutz) was conducted during developmental stages from larva to adult. During developmental stages the morphological variations were observed. The stages larva I, larva II was of longer duration and feeder as their adults do while the prepupa, pupa I and pupa II was resting stages and non feeder. Morphological variations in mouthparts, abdominal segments are also observed. The antennal segment of larva I, larva II, prepupa, pupa I and pupa II shows variation in morphology and number in filament segments. As compared to adult which consist eight segmented antenna, in larval stages antenna was seven segmented while in prepupa antenna was non segmented and horn shaped but in pupa I and pupa II antenna was segmented.

Keywords: *Elaphrothrips procer*, antenna, wing pad, mouthcone.

INTRODUCTION

Thrips enjoy a wide range of distribution, habits and ecological habitat. They occur on the tender, succulent parts of the plants, or under the barks of dead and drying twigs or among decaying leaves of grass, feeding on fungus spores and hypae. Though most of them are phytophagous, very few are predaceous feeding on mites, scales, psocids. Some of them produce and inhibit plant galls. While mycophagous or fungus feeding thrips are more common.

Elaphrothrips procer (Schmutz) (Family- Phlaeothripidae) is a mycophagous thrips and feeds on fungal spores and generally

occurs on the fungus infected dry leaves of *Butea monosperma* plant during humid seasons of the year. They are found within the curved folds of fungal infected dry leaves. They have peculiar, pearsing and sucking type of mouth parts with vestigial right mandible. Adults have two pairs of narrow fringed wings with long hairs and abdomen is long elongated with tube like anal segment.

MATERIALS AND METHODS

The thrips were collected from their host plant *Butea monosperma* dry fungal infected leave during the humid periods of the year when they mostly occur near the roadside of highway and field area around Akola region (M.S).

The adult male, female, larvae and eggs were kept in large plastic bowls along with fungus infected dry leaves. Then they transfer to the separate plastic rearing bowl to avoid overcrowding and food limitation. The newly hatched larvae were regularly fed on fungus infected dry leaves of *Butea monosperma*. For protection bowls were covered by muslin cloth. Light 12:12 and temperature ($25 \pm 1^\circ\text{C}$) were maintained. Relative humidity maintained at 80% by keeping wet filter paper in the rearing bowl, some time wet cotton plug also used.

Larval, prepupal and pupal stages were dehydrated with ethanol grades (30%, 50%, 70%, 90%, and Absolute) then after cleared in xylol, embedded in DPX for mounting onto slides. In the case of specimens long preserved in 70% alcohol, before mounting to put them in 96% alcohol to which ethyl acetate (1 part of ethyl acetate to 10 volume of water) has been added so as to make the materials soft.

For study of external morphology, slides of whole mounts of larvae and pupae were used.

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A preliminary survey for hard ticks (Acari: Ixodidae) diversity on the livestock in Akola District, Maharashtra. (India)

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Abstract

Hard ticks (Acari: Ixodidae) are ectoparasitic feeders on blood, they carry and transmit a wide range of diseases of veterinary importance. Akola district of Maharashtra, from India, has a wide range of livestock which faces a problem of infestation from hard tick and other parasites. We surveyed and reported diversity of these hard ticks infesting major livestock from different localities in Akola district, in the year 2013. 255 livestock, consisting of 71 cattle, 45 buffaloes, 86 goats, and 53 sheep of all 7 talukas of the district were searched and total 590 adult ticks belonging to six species were sampled and were identified at species levels. All the ticks, belonging to three genera: Hyalomma (Bont-legged ticks), Rhipicephalus (Brown ticks) and Haemaphysalis. The species of ticks documented from Akola district were, *Hyalomma anatolicum anatolicum*, *Hyalomma marginatum isaaci*, *Hyalomma hassani*, *Rhipicephalus boophilus micropilus*, *Rhipicephalus haemaphysaloides*, and *Haemaphysalis bispinosa*.

Key words: Acari, Ixodidae, Akola, Diversity, Livestock

Introduction:

All ticks are ectoparasitic obligatory feeders of blood. They are sanguivorous on vertebrate host: mammals' birds and reptiles. Along with spiders, Ticks included in class Arachnida in phylum Arthropoda (Soulsby, 1982). They belong to subclass Acari which consists of many orders of mites and one order of tick, the Ixodida. Though there are three families of ticks but two are important for domestic animals (Sonenshine, 2014). Family Argasidae contains the important genera Argas, Ornithodoros, and Otobius. These genera are known as soft ticks. The family Ixodidae comprised of 13 genera and approximately 650 species (Sonenshine, 2014). It contains the important genera Amblyomma, Dermacentor, Haemaphysalis, Hyalomma, Ixodes, Margaropus, and Rhipicephalus. These genera are known as hard ticks because their outer surfaces have hard plates. Also, the important boophilid ticks, formerly of the genus Boophilus, are now classified as a subgenus within the genus Rhipicephalus (Tailor, 2007). Within these genera, more than 100 species are reported to infest domestic animals. Some of these species also feed on humans (Tailor, 2007). Boophilid ticks, a subgenus within Rhipicephalus ticks, commonly known as cattle ticks or blue ticks, have a highly characteristic morphology and one-host lifecycle causing direct parasitic losses and by transmission of microbe. Hyalomma genus contains many species of hard ticks important to domestic animals in hot dry regions in India, Africa, Mediterranean basin, and the Middle East. Genus Haemaphysalis found in Asia, Europe, Africa, and Australia. They affect cattle, sheep, goats, horses, camels, dogs, cats, and humans, as well as large range of wild mammals, birds and reptiles. Being obligate parasites ticks infest almost all sorts of livestock affecting greatly their health by blood sucking and transmitting diseases like babesiosis, theileriosis, anaplasmosis etc (Jongejan and Uilenberg,

2004). An estimated annual loss of US\$ 500000 is reported alone from low quality hides and skin in eastern Ethiopia (Desalegn *et al.*, 2015) on account of tick infestation. Since beginning of 20th century few experts studied ticks from different parts of India (Sharif, 1928; Sen, 1938; Dhanda and Rao 1964; Varma and Mahadevan 1970; Kumar, *et al.*, 2002; Patel *et al.*, 2013; Singh and Rath 2013) and reported 109 species. Out of these 28 species of ticks reported to documented from Maharashtra by Sherif (1928); Sen, (1938); Srivastava and Wattal, 1973; Mishra, *et al.*, (1977); Raote, (1983); Shahardar, (1988); Varghese and Dhanda 1995).

Ticks as an obligatory ectoparasite of livestock, have high medical and veterinary importance, distributed all over the world. But their occurrence and prevalence differ greatly from region to region depending on various factors. In the present study a preliminary survey of tick is presented on the diversity and prevalence of ticks' species infesting major livestock in Akola district of Vidarbha region from Maharashtra. Study like this is locally important the studied district is a home for about 134481 goats, 49455 buffaloes, and 15467 exotic cross, and 269343 indigenous breed of cattle, (Govt livestock census report, 2012).

Materials and Methods.

Study Area:

The district of Akola lies in the western parts of the Vidarbha region of Maharashtra State and is surrounded by Amravati district in the north and north-east, Ycetmal in the south-east, Washim in the south and Buldhana in the west. The district lies between 19° - 51' and 21° - 16' latitude and 76° - 38' and 77° - 44' longitude. Though a large section of rural population depends on agriculture many of them also depend on livestock as additional livelihood. Thus these livestock plays an important role in the people's economy in the district.



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**Reproductive morphology in mycophagous thrips *Elaphrothrips procer*
(Thysanoptera: Elaphrothripidae)**

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ABSTRACT:

The order Thysanoptera encompasses minute insects called thrips which are usually a few millimetres long. The thrips shows many peculiarities in their reproductive morphology. Sexual polymorphism plays an important role in mating behaviour. In the present paper observation reproductive morphology on mycophagous thrips *Elaphrothrips sp* are discussed. The female reproductive system of investigated *Elaphrothrips* species consist a pair of ovaries which connect with a pair of lateral oviducts. They join to form a common oviduct and vagina. The female examined in this study possess one spermatheca and no accessory gland. Vagina is open exterior on IXth sternite by a median gonopore. The entire male reproductive system occupies the abdominal region from III to IX segments. It is consist of, a pair of testes, a pair of vasa deferentia, a pair of seminal vesicle, two pairs of accessory glands and an ejaculatory duct

Key words: *Elaphrothrips sp*, Ovary, Testis, Spermatheca, Accessory glands,

INTRODUCTION:

Elaphrothrips sp. is a mycophagous thrips feeds on fungal spores and generally occur on the fungus infected dry leaves of *Butea monosperma* plant during humid seasons of the year. Comparatively to the other thrips, the size of adults *Elaphrothrips sp* is large. Sexes easily differentiates due to male is larger than female. Male having tarsal tooth on foreleg, while in female absent. Larvae are red in colour with black terminal tubes, occurs in colony and eggs are dull white in colour glued vertically on the leaf surface and in group. This species are mostly available during month of September to November.

The Thysanoptera insects offer unique opportunities to study the other variables of social behaviour due to exhibits a wide variety of life histories and social interaction. Order Thysanoptera divided into two suborders i.e. Terebrantia and Tubulifera. Thrips belonging to Terebrantia possess a distinct saw like ovipositor while Tubulifera consist 10th abdominal segment which is drawn into a tube and the ovipositor is internal and flexible structure. The purpose of this paper is to analyse the reproductive morphology of mycophagous type of *Elaphrothrips* species.

MATERIAL AND METHODS:

Collection and Reproductive Morphology study:

The thrips were collected from their host plant *Butea monosperma* dry fungal infected leaf during the humid periods of the year when they mosy occur. The eggs, larvae, pupae and adults of *Elaphrothrips sp* were collected and carried to the laboratory along with leaf fold and fungal

infected dry leaves of *Butea monosperma* for rearing.

The collected specimens of *Elaphrothrips* adult male, female, larvae and eggs were kept in large plastic bowls along with fungus infected dry leaves. Then they transfer to the separate plastic rearing bowl to avoid overcrowding and food limitation. For protection bowls were covered by muslin cloth. Light 12:12 and temperature (25±1°C) were maintained. Relative humidity maintained at 80% by keeping wet filter paper in the rearing bowl.

For reproductive morphology studies adults were dissected out in insect Ringer's solution under stereo zoom microscope (Magnus).

The testes and ovaries were dissected out by picking both ends of the body and pulled out an abdominal tube with the help of fine forceps results into break up at IX abdominal tube and reproductive organs stretched out easily. The organs were observed under compound microscope without staining and photographed. Fixed the organ in Bouin's fluid and dehydrated in the alcohol series cleared in xylene, stained with Haematoxylin and Eosin and mounted in DPX. Whole-mounts of ovaries, testes and spermatheca were studied under compound microscope (Magnus). Photographs were made using a digital camera (Olympus: SP550UZ) and image projection system (MIPS). Measurements were made using the image analysis software (Olympus).

RESULTS AND DISCUSSION:

FEMALE REPRODUCTIVE ORGANS:

The female reproductive system of investigated species *Elaphrothrips procer* (Schmutz) consist a pair of ovaries which connect with a pair of lateral oviducts. They join to form a common



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MORPHOLOGICAL VARIATION OF THRIPS INSECT *ELAPHROTHRIPS PROCER*
(SCHMUTZ) (THYSANOPTERA:PHLAEOTHIRIPIDAE)

Nagrle S.M., I. A. Raja

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Department of Zoology, Shri Shivaji College of Arts, Commerce and Science, Akola, M.S.,
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ABSTRACT

Detailed study of insect *Elaphrothrips procer* (Schmutz) was conducted from larva to adult. During developmental stages the morphological variations were observed in the stages of larva I, larva II prepupa, pupa I and pupa II. On the basis of morphology, the male thrips is stronger than female and shows developmental variation than that of the female. Male thrips shows minor and major form i.e. normal, gynaecoid forms and overgrown, oedymorous form respectively. The male is longer than female, dark in colour and having elongated tubular abdomen than female. The size of the body length of the adult male is 7107 μm and female is 4984 μm long.

Key words: *Elaphrothrips procer*, developmental stages, gynaecoid, oedymorous, antenna

INTRODUCTION

Thrips are occur on the tender, succulent parts of the plants, or under the barks of dead and drying twigs or among decaying leaves of grass. They enjoy a wide range of distribution, habits and ecological habitat. Though most of them are phytophagous, very few are predaceous feeding on mites, scales, psocids. Some of them produce and inhibit plant galls. While mycophagous or fungus feeding thrips are more common.

Elaphrothrips procer (Schmutz) (Family-Phlaeothripidae) is a mycophagous thrips. They are found within the curved folds of fungal infected dry leaves and feeds on fungal spores and generally occurs on the fungus infected dry leaves of *Butea monosperma* plant during humid seasons of the year. They have peculiar, pearcing and sucking type of mouth parts with vestigial right mandible. Adults have two pairs of narrow fringed wings with long hairs and abdomen is long elongated with tube like anal segment.

MATERIALS AND METHODS

The thrips were collected from their host plant *Butea monosperma* dry fungal infected leave during the humid periods of the year when they mostly occur near the roadside of highway and field area.

The adult male, female, larvae and eggs were kept in large plastic bowls along with fungus infected dry leaves. Then they transfer to the separate plastic rearing bowl to avoid overcrowding and food limitation. For protection bowls were covered by muslin cloth. Light 12:12 and temperature (25 \pm 1 $^{\circ}$ C) were maintained. Relative humidity

maintained at 80% by keeping wet filter paper in the rearing bowl, some time wet cotton plug also used.

Developmental stages and adults were dehydrated with ethanol grades (30%, 50%, 70%, 90%, and Absolute) then after cleared in xylol, embedded in DPX for mounting onto slides. In the case of specimens long preserved in 70% alcohol, before mounting to put them in 96 % alcohol to which ethyl acetate (1 part of ethyl acetate to 10 volume of water) has been added so as to make the materials soft.

For study of external morphology, slides of whole mounts of larvae, pupae and adults were used. All observations were made under compound microscope (MLX series Magnus) and stereo zoom microscope (Magnus) for better and detailed study of the sample. Computerised micro measurements were also done by using image analysis software (Olympus).

RESULTS AND DISCUSSION

Larva and the adult have similar structure of the antennae, the antennal setae, sensorium and the mouth parts in both adapted for the fungus feeding. The integuments are sclerotinized at the head, thorax and abdominal terminal segment IX and X.

Larva I: Body is elongated, red in colour. Body measurement is about 1.85 \pm 0.03 μm in length. The head is cylindrical and legs are grey with red pigments. The abdominal terminal segments IX and X are dark in colour (Fig.1B). The antennae are greyish in colour with total seven segments, the basal single scape, the middle single



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X- RAY DIFFRACTION STUDY OF DRAGLINE SILK OF NEPHILA PILIPES (ARANEAE; ARANEIDAE)

A. S. SAWARKAR , S. B. SAWARKAR

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Abstract: Orb web spider *Nephila pilipes* produces six different types of silks like dragline, auxiliary spiral, egg sac silk, sticky capture silk, attachment discs, swathing bands etc. The x- ray diffraction pattern of dragline silk of *Nephila pilipes* was recorded. The dragline silk of *Nephila pilipes* showed very broad x- ray diffractogram at $2\theta = 10^{\circ} - 40^{\circ}$. The x- ray diffraction patterns are composed of two phases called as amorphous and crystalline. Spider silk has semicrystalline structure with crystalline particles embedded in the amorphous matrix. In dragline silk, particle size ranges from 0.99 – 4.37 nm. Average crystallite size of dragline silk was found to be 2.1 nm. In *Nephila pilipes*, protein crystals occupy 44.97 % of total volume of dragline silk. Remaining volume of silk is amorphous in nature. This nanostructural features of spider silk plays very important role in enhancing mechanical performance of silk threads. Hence, it can be concluded that, spider silk having high and stable mechanical performance is found in nature. Successful large scale production of this beautiful, naturally golden colored spider silk with DNA recombinant technology will definitely open a new gate in textile sector.

Keywords: Dragline silk, *Nephila pilipes*, x- ray diffraction.

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RESEARCH ARTICLE

Zinc induced histopathological and biochemical anomalies in the liver of fish *Ophiocephalus punctatus*

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<p>Available online on http://www.ijlsci.in</p> <p>ISSN: 2320-964X (Online) ISSN: 2320-7817 (Print)</p> <p>Editor: Dr. Arvind Chavhan</p> <p>Cite this article as: Sawarkar Archana S (2017) Zinc induced histopathological and biochemical anomalies in the liver of fish <i>Ophiocephalus punctatus</i>, <i>Int. J. of Life Sciences</i>, Special Issue, A8: 147-150.</p> <p>Copyright: © Author, This is an open access article under the terms of the Creative Commons Attribution-Non-Commercial - No Derives License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.</p>	<p>The continuous discharge of effluent containing heavy metals and their compounds at an unprecedented and constantly increasing rate, even below permissible level from various industries into aquatic bodies may result in accumulation and subsequent magnification up to dangerous level because of their toxicity, water solubility and non- degradable qualities. Their tendency to accumulate in the organism and in undergoing food chain amplification, causing disorder in the aquatic ecosystem with deteriorious effect on biolife in unnaturally high concentration. The present study deals with the toxicity of zinc (ZnSO₄), as a component of industrial waste and its effect on liver of fish <i>Ophiocephalus punctatus</i>. The toxicity of zinc even at sublethal level causes histopathological disorganization of hepatocytes. The estimated protein concentration increased, whereas, glycogen and lipid content were found to be reduced in the liver during the exposure periods. These adverse effects of zinc toxicity reduce functional capacity of liver and caused reduction in nutritive value of fish significantly.</p> <p>Key words: <i>Ophiocephalus punctatus</i>, zinc, liver, protein, glycogen, lipid.</p> <p>INTRODUCTION</p> <p>Zinc in traces is essential to sustain biological processes such as optimum body growth, development, reproduction and as immune stimulant. Its presence is essential for smooth working of various important enzymes like DNA and RNA polymerase, reverse transcriptase, alcohol dehydrogenase, sarbitol dehydrogenase, glucose -6- dehydrogenase etc. Its deficiency leads to retardation of growth, chronic renal disease, oligospermia, cessation of estrous and menstrual cycle in mammals. Zinc is an essential and beneficial element in human metabolism.</p> <p>Despite being an essential trace element, Zn is toxic to most organisms above certain concentrations. (Ho, 2004). When fishes are exposed to great elevate level of metal in polluted aquatic ecosystem, they tends to take these metals up from their direct environment (Hoo <i>et al.</i>, 2004;</p>

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**Medicinal prospects formajor ampullate silk of giant wood spider,
*Nephila pilipes*****Sawarkar A. S. and Sawarkar S. B.***

Department of Zoology, Shri. R. L. T. College of Science, Akola 444001

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E-mail: assawarkar@yahoo.com**Abstract**

Spiders are well known for the silk they secrete. Amongst various spider species, *Nephila* is known for its long lasting and big size orb web having elastic but tough silk. Silk is an essential element in the life of orb weavers like *Nephila pilipes*. Silk appears in variety of physico-chemical forms from the body of this single individual. Spider silk is a protein-based material that does not appear to cause any allergic or inflammatory reaction. This remarkable fiber is very durable and can resist degradation in a wide variety of environments. Major ampullate silk of *Nephila pilipes* possesses the properties like water absorbance, supercontraction and antibacterial nature. Thus, this silk of *Nephila pilipes* could be potential source as antibacterial agent. It can be used in bandages for advanced dressing of slow healing wounds. Major ampullate silk of *Nephila pilipes* can also be used for manufacture of surgical threads, clinical masks and antibacterial cloths for small children.

Key words: Spider, *Nephila pilipes*, Major ampullate silk, Antibacterial, Biomaterial.

Introduction

We often take pride in our ability to create materials that are superior to ones created by nature. Yet some of the materials that nature creates out form everything designed by the human mind (Becker *et al.*, 2003). Spider silk is one of them, which have fascinated men for a long time. The production of silk is widespread among animal kingdom but it is particularly associated with phylum arthropoda. Certain insects like some lepidoptera, hymenoptera and neuropteran are capable of silk production. This ability is usually restricted to a single stage in their life span such as to build cocoon prior to pupation. In contrast, spiders have capacity to produce silk throughout their life. Silk production from the abdominal silk glands is unique to spiders which have made them successful in any habitat on the earth surface. Spiders depends on their silk for variety of life activities and functions like shelter, prey capture, dispersal, safety lines etc. Spider silk also contributed significantly in human welfare. An antibiotic property, light in weight, biocompatible and biodegradable nature of the spider silk motivates researchers for their use in medical science.

Material and Methods

Major ampullate silk samples were taken from the frame thread of the orb web of *Nephila pilipes*. For studying supercontraction, shrinkage of silk in pure water was calculated with formula given by Shao and Vollrath (1999). Water absorbance property of major ampullate silk threads of *Nephila pilipes* were observed. Antibacterial activity of major ampullate silk of *Nephila pilipes* were tested for bacteria like *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa* etc. Antimicrobial assay was performed using agar plates. Major ampullate silk threads (~ 1 mg) were first gently washed in sterilized distilled water and placed on the surface of inoculated agar. This process was carried out in flame zone of burner in a laminar

air flow to avoid any kind of contamination. Plates were incubated for 24 hours at 37 °C and examined to observe zone of inhibition.

Results and Discussion

Nephila pilipes construct comparatively very big web in the woods of India. Dragline silk of *Nephila pilipes* as well as the main structural elements of *Nephila pilipes* web i.e. foundation lines and radii are having yellowish golden tinge. This silk is secreted from major ampullate glands.

A common feature of major ampullate silk of *Nephila pilipes* is its ability to shrink when submerged in water. Dragline or major ampullate silk thread get immediately supercontracted in contact with water. It was observed that major ampullate silk of *Nephila pilipes* shrank about 47 % (Table- 1; n= 05). Once a thread has shrunk to its maximally contracted state, it can no longer supercontract.

There are manmade polymers which exhibit supercontraction in organic solvents or when heated, but virtually none of which will supercontract in pure water at room temperature (Lewis, 1992). But a common feature of typical dragline silk is their apparent ability to supercontract when submerged in a solvent such as water (Work, 1977). Supercontraction property shows that dragline filaments are very sensitive to moisture. It causes the fiber to swell and increases its extensibility. The property of dragline silk of *Nephila pilipes* to supercontract immediately in water indicates that the elements of spider silk are oriented along the fiber axis. This is confirmed with the help of AFM images of dragline silk (Amaley *et al.*, 2015). Supercontraction generates substantial stress in silk when it is restrained, such as in the frames and radii of orb webs. Thus, supercontraction provides an advantage to the spider by tightening the web whenever the humidity is very high by contraction of the attachment lines and the framework of the web. This could potentially help



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ISOLATION, IDENTIFICATION AND SYNTHESIS OF ANALOGUES OF KAEMPFEROL ISOLATED FROM PHYLLANTHUS NIRURI

KETKI. D. BANSOD, PRADIP P. DEOHATE

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Accepted Date: 05/09/2017; Published Date: 10/10/2017

Abstract: Kaempferol has been isolated from *Phyllanthus niruri* and identified. Five analogues of Kaempferol have been synthesized and characterized by chemical and spectral data.

Keywords: Kaempferol, Analogues.



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SYNTHESIS OF TRIAZOLO-DITHIADIAZINES BY SULPHUR-SULPHUR BOND FORMATION THROUGH MICROWAVE ASSISTED CYCLOCONDENSATION AND BIOLOGICAL EVALUATION

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Abstract: Synthesis of 3-arylimino-6-pyridin-4-yl-[1,2,4]-triazolo-(3,4-c)-[1,2,4,5]-dithiadiazines by sulphur-sulphur bond formation through microwave assisted cyclocondensation was performed by treating 4-amino-3-mercapto-5-pyridin-4-yl-4H-[1,2,4]-triazole with *N*-aryl-5-chloro isothiocarbamoyl chlorides. Synthesis of 4-amino-3-mercapto-5-pyridin-4-yl-4H-[1,2,4]-triazole was carried out by reaction of isoniazide, carbondisulphide and potassium hydroxide followed by the addition of hydrazine hydrate. Triazolo-dithiadiazines were then acetylated to afford monoacetyl derivatives. Structures of all synthesized compounds were delineated by elemental analysis, equivalent weight determination, chemical transformation, IR, ¹H-NMR, mass spectral studies and evaluated for biological activity against different micro-organisms.

Keywords: Triazolo-dithiadiazines, microwave cyclocondensation, biological evaluation



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Conventional and MW induced synthesis of some bridgehead nitrogen containing triazolo-dithiadiazines by sulphur-sulphur bond formation through cyclocondensation and antimicrobial study

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Abstract : Conventional and MW induced synthesis of 3-aryl/alkylimino-6-pyridin-4-yl-[1,2,4]-triazolo-(3,4-c)-[1,2,4,5]-dithiadiazines have been carried out by reacting 4-amino-3-mercapto-5-pyridin-4-yl-4H-[1,2,4]-triazole with *N*-aryl/alkyl-*S*-chloro isothiocarbamoyl chlorides followed by the basification with dilute ammonium hydroxide solution. 4-Amino-3-mercapto-5-pyridin-4-yl-4H-[1,2,4]-triazole was synthesized by the interaction of isoniazide with carbondisulphide and potassium hydroxide followed by the addition of hydrazine hydrate. The structures of synthesized compounds have been established on the basis of chemical transformation, elemental analysis, equivalent weight determination and IR, ¹H NMR, mass spectral studies. The title compounds have been assayed for their antimicrobial activity against Gram-positive as well as Gram-negative micro-organisms.

Keywords : Conventional, MW, synthesis, triazolo-dithiadiazines, antimicrobial study.

Introduction

Synthesis of organic compounds by microwave technique provides a number of advantages over the standard heating¹. High density microwave irradiation technology has emerged as a reliable and useful methodology for accelerating time consuming reactions² and can be adapted for high speed parallel synthesis of a library of bioactive compounds^{3,4}. Heterocyclic compounds especially those containing sulphur and nitrogen atoms possess a wide variety of biological activities^{5,6}. Synthesis, structural properties and antimicrobial activities of substituted [1,2,4,5]-dithiadiazines have been reported earlier in some communications⁷⁻⁹. Therapeutic effect of [1,2,4]-triazole and [1,2,4]-triazole-3-one containing compounds have been well studied for a number of pathological conditions including inflammation, cancer, pain, tuberculosis and hypertension^{10,11}. Fused [1,2,4]-triazoles are found to possess diverse applications in the field of medicine^{12,13}. Synthetic applications of *N*-aryl/

alkyl-*S*-chloro isothiocarbamoyl chlorides have been investigated earlier and shown to have enough potentiality in the synthesis of nitrogen and sulphur containing 5 and 6 membered heterocyclic compounds^{14,15}. On perusal of literature, it has been observed that there is scanty work on the synthesis of [1,2,4]-triazolo-[1,2,4,5]-dithiadiazines. In view of these findings and as a part of wider programme to provide alternative routes of synthesis^{16,17}, we report herein the synthesis of substituted [1,2,4]-triazolo-(3,4-c)-[1,2,4,5]-dithiadiazines by conventional heating as well as MW irradiation.

Results and discussion

Isoniazide was transformed into 4-amino-3-mercapto-5-pyridin-4-yl-4H-[1,2,4]-triazole (2) by interacting with carbondisulphide (0.01 mol) and potassium hydroxide (1 M, 10 ml) followed by the addition of hydrazine hydrate (0.01 mol). Compound (2) was then reacted with *N*-aryl/alkyl-*S*-chloro



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Non-aqueous potentiometric determination of pharmaceutically potent drug diphenhydramine hydrochloride

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Abstract : The non-aqueous potentiometric determination of pharmaceutically potent drug diphenhydramine hydrochloride by performing the titrations using isopropyl alcohol as the solvent and KOH in isopropyl alcohol as the titrant has been carried out. The effect of solvent and concentration on potentiometric determination of this drug has been studied followed by its estimation in single component tablets. A pair of glass and calomel electrode was used to do the titrations. The method was found to be precise for assay of diphenhydramine hydrochloride and results obtained are comparable with those obtained by Indian Pharmacopoeia (I.P.) method.

Keywords : Non-aqueous, potentiometric determination, diphenhydramine hydrochloride.

Introduction

The potentiometric determination in non-aqueous media using different electrode pairs has been reported earlier¹. Literature is enriched with various methods for the determination of drug diphenhydramine hydrochloride². Its estimation by conductometry has been reported earlier by few workers³. It has been also determined by spectrophotometric method⁴ and analyzed by liquid chromatography⁵. Diphenhydramine hydrochloride is distinctly acidic and due to its easy hydrolysis it could not be titrated directly with aqueous alkali. Basic titrant is superior to the alkoxide solvents which are more susceptible to the atmospheric moisture and carbondi-oxide. The aim of present work is to find out the simple procedure for analysis of common drugs that will help in determination of raw materials and products for quick check of spurious drugs which are feared to penetrate the markets. The non-aqueous potentiometric determination of drug diphenhydramine hydrochloride by performing the titrations using isopropyl alcohol as the solvent and KOH in isopropyl alcohol as the titrant has been reported in this communication. The

effect of solvent, concentration and the estimation of this drug in single component tablets have been also studied.

Results and discussion

Effect of solvent and concentration on potentiometric determination of diphenhydramine hydrochloride :

In the study of effect of solvent, the accuracy of results in determination of drug diphenhydramine hydrochloride by using different solvents was checked by potentiometric titration method. The required volumes of the stock solutions of this drug in different solvents were diluted to 20 ml and titrated separately with KOH in isopropyl alcohol. The results obtained are tabulated and it can be seen from that, the accuracy of result in determination of diphenhydramine hydrochloride by using the solvent isopropyl alcohol is much more with minimum % error as compare to other solvents (Table 1). As compared to the solvent dimethyl formamide, methanol and acetone the potentiometric break obtained using isopropyl alcohol is much more pronounced and prominent with maxi-



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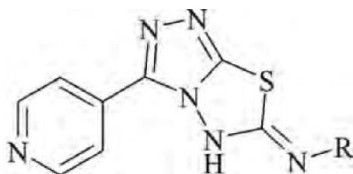
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The Conventional and MW Assisted Syntheses of Some Bridgehead Nitrogen Containing Triazolo-thiadiazoles by Cyclocondensation using N-Aryl Isocyanodichlorides and Antimicrobial Evaluation

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ABSTRACT The conventional and MW-assisted syntheses of 6-arylimino-3-pyridin-4-yl-[1,2,4]-triazolo-(3,4-b)-[1,3,4]-thiadiazoles (**4**) have been carried out by interacting 4-amino-3-mercapto-5-pyridin-4-yl-4H-[1,2,4]-triazole (**2**) with *N*-aryl isocyanodichlorides (**3**) followed by the basification with dilute ammonium hydroxide. The acetylation of triazolo-thiadiazoles afforded acetyl derivatives. Structures of synthesized compounds have been established on the basis of chemical transformation, elemental analysis, equivalent weight determination, and infrared, ¹H nuclear magnetic resonance, mass spectral studies. Title compounds have been assayed for their antimicrobial activity against Gram-positive and Gram-negative microorganisms.



KEYWORDS Conventional, MW, Synthesis, Triazolo-thiadiazoles, Antimicrobial evaluation.

INTRODUCTION

Synthesis of organic compounds under the influence of microwave conditions has received considerable attention as a reliable and useful methodology for accelerating time-consuming reactions^[1] and can be adapted for high-speed parallel synthesis of a library of bioactive compounds.^[2,3] Heterocyclic compounds, especially those containing sulfur and nitrogen atoms, possess a wide variety of biological activities. Therapeutic effect of [1,2,4]-triazole and [1,2,4]-triazole-3-one containing compounds have been well studied for a number of pathological conditions including inflammation, cancer, pain, tuberculosis, and hypertension.^[4,5] Fused [1,2,4]-triazoles are found to possess diverse applications in the field of medicine.^[6,7]

Triazolo-thiadiazoles are found to show a broad spectrum of pharmacological properties such as antifungal, antibacterial, antiviral, anticonvulsant, anti-inflammatory, antitubercular, and analgesic activities.^[8-11] These two fused systems are reported to possess significant central nervous system depressant, anthelmintic, and other pharmaceutical activities.^[12,13] Synthetic applications of *N*-aryl isocyanodichlorides have been investigated earlier and shown to have enough potentiality in the synthesis of nitrogen- and sulfur-containing heterocyclic compounds.^[14] In view of these findings and as a part of a wider program to provide alternative routes of synthesis,^[15,16] we report herein the synthesis of substituted [1,2,4]-triazolo-(3,4-b)-[1,3,4]-thiadiazoles by conventional heating as well as MW irradiation.

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SIMULTANEOUS NON-AQUEOUS POTENTIOMETRIC DETERMINATION OF PHARMACEUTICALLY POTENT IBUPROFEN-DIPHENHYDRAMINE HYDROCHLORIDE AND PARACETAMOL-DIPHENHYDRAMINE HYDROCHLORIDE COMBINATION DRUGS

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ABSTRACT

The simultaneous non-aqueous potentiometric determination of pharmaceutically potent combination drugs by using isopropyl alcohol as the solvent and KOH in isopropyl alcohol as the titrant has been established. The two acidic combination drugs ibuprofen-diphenhydramine hydrochloride and paracetamol-diphenhydramine hydrochloride were determined simultaneously in their binary mixtures by the non-aqueous differentiating potentiometric titration methods. These drug combinations are widely used in medicines. Titrations were carried out using a pair of glass and calomel electrodes. The method was found to be precise for assay of double component tablets and results obtained are comparable with those obtained by Indian Pharmacopoeia (I.P.) method.

Keywords: Non-aqueous, potentiometric determination, combination drugs

INTRODUCTION

The non-aqueous potentiometric determination has been reported earlier using the pairs of different electrode¹⁻⁵. Different methods were suggested for the estimation of two or more drugs in combination and deals mostly with the separation of components followed by determination of individual component using suitable technique. For the determination of drugs in combination various methods were included in the pharmacopoeias⁶⁻⁸. Differentiating potentiometric titrations of mixtures like paracetamol-barbitone², paracetamol-salicylamide^{9,10}, paracetamol-aspirin¹¹ etc. have also been reported in literature. The literature is enriched with determination of nimesulide-tizanidine¹², nimesulide-chlorzoxazone¹³, nimesulide-diclofenac sodium¹⁴ etc. Binary mixture of ibuprofen-paracetamol¹⁵ as well as ternary mixture of ibuprofen-paracetamol-chlorzoxazone¹⁶ has also been determined by spectrophotometric and chromatographic technique. Determination of combination of ibuprofen-diphenhydramine hydrochloride and paracetamol-diphenhydramine hydrochloride drugs by differentiating potentiometric method using acetone or isopropyl alcohol was not reported in literature so far. As these drugs are distinctly acidic, could not be titrated directly with aqueous alkali due to their hydrolysis. The basic titrant is also superior to the alkoxide solvents which are more susceptible to the atmospheric

moisture and carbon dioxide. The aim of the present work is to find out simple analysis procedure for common drugs which will help the analysis of raw materials and products for quick check of spurious drugs that are feared to penetrate the markets. In this communication, study non-aqueous titrations were carried out to determine one component in presence of other without any prior separation. Determination of ibuprofen and diphenhydramine hydrochloride as well as paracetamol and diphenhydramine hydrochloride in two component tablets has been carried out using isopropyl alcohol as the solvent and KOH in isopropyl alcohol as the titrant by potentiometric titration method.

MATERIAL AND METHODS

The potentiometric titrations were carried out by using a digital potentiometer (Equiptronics, EQ-602). Glass and calomel electrodes were used as indicator and reference electrode respectively. Weighing of all the drugs and chemicals was made on Precisa-310-M (± 0.001 g) balance. The chemicals and solvents of AR grade were used. All solvents were purified and made anhydrous by standard methods¹⁷. Care was taken to protect the titrant from atmospheric moisture and carbon dioxide. The drugs selected for present investigation were obtained from pharmaceutical laboratories. These drugs are of pharmaceutical nature and are included in pharmacopoeias⁶⁻⁸. During this analysis, ibuprofen-diphenhydramine hydrochloride and paracetamol-diphenhydramine

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USE OF NATURAL FOOD ADDITIVES FROM HYDROCERUS UNDATUS (DRAGON FRUIT) IN FOOD INDUSTRY- A GREEN STEP IN GREEN CHEMISTRY.

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ABSTRACT

Natural food colour in any dye obtained from any vegetable, animal or mineral which is capable of colouring food, drugs, cosmetics or any part of human body. These natural colour or additives come from variety of sources such as seeds, fruits and vegetables, leaves algae and insects. Sometimes due to lack of knowledge the applications of these additives are not widely used. Dragon fruit or pitahaya is one of the tropical fruit which has low calories and filled with various nutritive elements, vitamins and antioxidants. Dragon fruit is cultivated in India by farmers. In Maharashtra, area like karjat, solapur and Pune and even in certain places of Hyderabad. Dragon fruits is also called as strawberry pear. Dragon fruit colouring powder named (DFCP) as a natural food additive using dragon fruit albedo which is nothing but thin layer of dragon fruit peel. The albedo of dragon fruit is dried and use to colour various food stuffs. In this study, a conventional method was used to access the albedo powder and as a additive in a similar process to saffron as a food colouring. To prepare powder from albedo the dragon fruit was dried on a stove after outer layer was peeled. Heating at low temperature is one of the conventional method for drying dragon fruit albedo. Using DFPC as natural food colourant is healthy for humans and also ecofriendly to society.

Keywords: Albedo, dragon fruit, peel, conventional.

INTRODUCTION

Dragon fruit is one of the tropical fruit which has low calories and filled with various nutritious elements, vitamins and antioxidants. Though the dragon fruit is popular in several American and South Asian countries but due to its delicious taste and health benefits it is becoming popular in India too.

In India the crop is cultivated by formers in areas like, Karjat, Solapur, and Pune in Maharashtra and even in certain places of Hyderabad.

Since this plant is from cactus family it requires less water.

Traditionally people use natural colour which obtained from nature. We use turmeric, saffron, various flower petals, paprika and beet extracts as yellow, orange, red etc. colours into various food stuffs which plays vital role for human health. (Arnell, Need, M. 2011).

In the beginning of 20th Century, numerous synthetic food additives had been produced, however only few synthetic colours approved to be used since the banned items have been identified as being potential cancer – causing chemicals. According to FDA, since 1955, the trend of synthetic food consumption has been stronger. The

excessive increase is due to higher consumer on processed food, such as soft drinks, breakfast cereals, candies, Snacks, food, baked food, frozen desert, pickles, salad dressing. Where synthetic colours being used on large scale. However, it is challenge how we replace synthetic food colouring with natural one.

To overcome such problem using dragon fruit albedo namely Dragon fruit colouring powder (DFCP). It is tremendously healthy and attractive especially for consumers. Developing DFPC as the natural food colorants is not healthy for human body but also eco-friendly to society. It is estimated to cost effective as it is sourced from the only disposable part (peel) of the fruit. The DFPC has several properties compared to the extracted flesh from fruit, which is feasible to carry, packing and less space for storing.

“Red pitaya” or dragon fruit has rich sources of vitamins eg. B1, B2, B3 and C, minerals eg. Potassium sodium, calcium, iron and phosphorous and nutrients eg. fat, protein carbohydrate, flavonoids, crude fiber, thiamin, phytoalbumin, niacin, pyridoxine, glucose, betacyanins, phenolics, carotene and polyphenol (Le Bellec *et al.*, 2006). It has relatively high antioxidant activity in comparison with other subtropical fruits (Davis



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Personal Iris Recognition Using Neural Network

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Abstract:-

Iris recognition is one of important biometric recognition approach in a human identification is becoming very active topic in research and practical application. Iris. region is the part between the pupil and the white sclera. This field is sometimes called iris texture. The iris texture provides many minute characteristics such as freckles, coronas, stripes, furrows, crypts, etc . These visible characteristics are unique for each subject. Such unique feature in the anatomical structure of the iris facilitates the differentiation among individuals. The human iris is not changeable and is stable. From one year of age until death, the patterns of the iris are relatively constant over a person's lifetime. Because of this uniqueness and stability iris recognition is a reliable human identification technique. Neural network based decision support system, is used for persons identification from IRIS recognition

Keywords :- sclera ,freckles, coronas, furrows

Introduction :-

Today's E-Security are in critical need of finding accurate, Secure and cost effective alternatives to passwords and personal identification numbers as financial losses increase dramatically year over year from computer based fraud such as computer hacking and identity theft. Biometric solutions address these fundamental problems, because an individual Biometric data is unique and can not be transferred Biometric is automated methods of identifying a person or verifying the identity of a person based on physiological or behavioural characteristic.

For Example of physiological char. Include hand, finger image and facial characteristic and iris recognition behavioural char. Are trends which can be learn or acquired

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Synthesis of Some Novel Organic N-Lactosylated Thio Carbamides Nanoparticles

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Abstract:

Nanoparticles are of great scientific interest as they are effectively a bridge between bulk materials and atomic or molecular structures. Nanoparticles research is currently an area of intense scientific research, due to a wide variety of potential application in biomedical, optical and electronic fields. In view of this it appeared quite interesting to prepared Nanoparticles of organic compounds containing carbohydrates

Key words: Lactosyl thiocarbamides, Nanoparticles and Antimicrobial activity.

Introduction:

Nanoparticles are at the leading edge of the rapidly developing field of nanotechnology. Their unique size depended properties make these materials superior and indispensable in many areas of human activity. In recent years, nanoparticles are gaining importance due to their unique properties and their antimicrobial activities that are significantly different from those of bulk materials¹.

Nanostructure materials are attracting a great deal of attention because of their potential for achieving specific processes and selectivity, especially in biological and pharmaceutical applications². Recent studies have demonstrated that especially formulated nanoparticles have good antibacterial activity^{3,4}.

In view of applications of lactosyl thiocarbamides and the nanoparticles in medicinal chemistry and in many other ways⁵, we herein report the synthesis of 1-hepta-o-benzoyl β-D-lactosyl-3-aryl- thiocarbamides nanoparticles by the use of ultrasonicator.

Experimental:

Specific rotations were measured on Equip-Tronics Digital Polarimeter at 28 °C in CHCl₃. IR spectra were recorded on Perkin-Elmer spectrum RXI FTIR spectrophotometer (4000-450 cm⁻¹). ¹H NMR was recorded in CDCl₃ on Bruker DRX-300 spectrometer operating at 300 MHz. The mass spectra were recorded on Jeol-SX-102(FAB) instrument.

a) Preparation of lactose octabenzoate:

In a 1 litre bottle having a tight cork, 55 ml dry pyridine and 55 ml of dry chloroform was taken. The bottle was cooled in an ice-salt bath. Now to this solution previously prepared cooled solution of 55 ml of benzoyl chloride in 55 ml dry chloroform was added with constant stirring. To this solution 20 gm of dry powder of lactose was added in several installments with constant stirring and maintaining the temperature of the reaction mixture below 5° C. This solution was allowed to stand for 24 hr, it was then transferred to a 500 ml conical flask. The solution was washed several times with dilute aqueous sulphuric acid, water. The solution layer was separated by

separating funnel. Afterwards the chloroform was removed, a white precipitate was isolated with petroleum ether and purified with chloroform ether with m.p.114°C.

b) Preparation of brominating reagent:

Glacial acetic acid (30 ml) was taken in a conical flask and to it was added red phosphorous (3.0 gm). To this mixture molecular bromine (7 ml) was added gradually with constant shaking and cooling. The resultant mixture was allowed to stand at ice cold temperature for about a 30 min.

c) Synthesis of hepta-O-benzoyl-α-D-lactosyl bromide:

The finally powdered lactose octabenzoate(0.03M, 21.0g) was added gradually to the brominating agent. After the addition the flask was kept for 2hr at room temperature. Then the reaction mixture with chloroform (130ml) then the mixture was shaken vigorously for about 15 min. The resultant mixture was poured into ice cold water. The chloroform layer was then separated. It was washed several with aqueous sodium bicarbonate to remove excess of acetic acid followed by aqueous sodium metabisulphite to remove excess of bromine and finally 2-3 times with water. To the chloroform addition of petroleum ether afforded a solid (16.5 gm). This solid was expected hepta-O-benzoyl-α-D-lactosyl bromide (yield 77%). It was purified by dissolving it in minimum quantity of chloroform and reprecipitating it with petroleum ether m.p.168°C.

(2)Preparation of lead thiocyanate :

Lead thiocyanate was prepared by mixing aqueous solution of lead nitrate and ammonium thiocyanate. The white granular lead thiocyanate was filtered washed with distilled water and dried at 50° C.

(3)Preparation of hepta-O-benzoyl-β-D-lactosyl isothiocyanate :

To a suspension of hepta-O-benzoyl-α-D-lactosyl bromide (21 gm,0.03M) in sodium dried xylene (80ml) was added lead thiocyanate (6gm,0.03M). The reaction mixture was then treated for microwave synthesis for about 3 min. This solution was then cooled and liberated lead bromide was removed by filtration. The xylene filtrate was then treated with petroleum ether



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**A FACILE SYNTHESIS OF SOME NEW N- LACTOSYLATED THIOCARBAMATES
NANOPARTICLES AND COMPARATIVE ACCOUNT OF THEIR
ANTIMICROBIAL ACTIVITY WITH BULK SOLUTION**

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Abstract: Nanoparticles are of great scientific interest as they are effectively a bridge between bulk materials and atomic or molecular structures. Nanoparticles research is currently an area of intense scientific research, due to a wide variety of potential application in biomedical, optical and electronic fields. In view of this it appeared quite interesting to prepared Nanoparticles of organic compounds containing carbohydrates.

Keywords: Lactosyl thiocarbamides, Nanoparticles and Antimicrobial activity.

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SYNTHESIS AND CHARACTERIZATION OF HEPTA-O-BENZOYL- β -D-MALTOSYL ISOTHIOCYANATE NANOPARTICLES

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ABSTRACT

The properties of many conventional materials change when formed from nanoparticles. This is typically because nanoparticles have a greater surface area per weight than larger particles which causes them to be more reactive to some other molecules. Nanoparticles are used, or being evaluated for use, in many fields. In view of application of Nanoparticles and maltosyl compounds in this research work we have synthesized the series of maltosyl thiocarbamates Nanoparticles and compare the microbial activity of this nanoparticle with the bulk solution of the same compounds.

Keywords: Maltosyl thiocarbamates; Nanoparticles and Antimicrobial activity.

INTRODUCTION

Carbohydrate especially lactosyl compounds have been used as starting material in the synthesis of nitrogen and sulphur containing open chain and cyclic compound which was already investigated by earlier workers. Nanoparticles exhibit new physical-chemical properties which are not observed either in individual molecules, or in bulk. Nanoparticles show unique properties that are significantly different from their bulk materials. In view of this application of lactosyl compounds and Nanoparticles in this we have synthesis to investigate the chemistry of this new compound with reference to their application.

Nanostructure materials are attracting a great deal of attention because of their potential for achieving specific processes and selectivity, especially in biological and pharmaceutical applications^{2,3}. Recent studies have demonstrated that especially formulated nanoparticles have good antibacterial activity^{4,5}.

EXPERIMENTAL

UV-visible Spectra is measured using UV Spectrophotometer by using model Single Beam UV-Visible Spectrophotometer with software (BI/CI/SP/SB-S-03) of Bio Era make. IR spectra were recorded on Perkin-Elmer spectrum RXI FTIR spectrophotometer (4000-450 cm⁻¹). ¹H NMR was recorded in CDCl₃ on Bruker DRX-300 spectrometer operating at 300 MHz.

a) Synthesis of hepta-O-benzoyl- α -D-maltosyl bromide:

The finally powdered Maltose octabenzoate (0.03M, 21.0g) was added gradually to the

brominating agent. After the addition the flask was kept for 2hr at room temperature. Then the reaction mixture with chloroform (130ml) then the mixture was shaken vigorously for about 15 min. The resultant mixture was poured into ice cold water. The chloroform layer was then separated. It was washed several with aqueous sodium bicarbonate to remove excess of acetic acid followed by aqueous sodium metabisulphite to remove excess of bromine and finally 2-3 times with water. To the chloroform addition of petroleum ether afforded a solid (16.5 gm). This solid was expected hepta-O-benzoyl- α -D-maltosyl bromide (yield 77%). It was purified by dissolving it in minimum quantity of chloroform and reprecipitating it with petroleum ether, m.p. 168°C.

b) Preparation of lead thiocyanate :

Lead thiocyanate was prepared by mixing aqueous solution of lead nitrate and ammonium thiocyanate. The white granular lead thiocyanate was filtered washed with distilled water and dried at 50°C.

c) Preparation of hepta-O-benzoyl- β -D-maltosyl isothiocyanate⁶ :

To a suspension of hepta-O-benzoyl- α -D-maltosyl bromide (21 gm, 0.03M) in sodium dried xylene (80ml) was added lead thiocyanate (6gm, 0.03M). The reaction mixture was then treated for microwave synthesis for about 3 min. This solution was then cooled and liberated lead bromide was removed by filtration. The xylene filtrate was then treated with petroleum ether (60-80°C)



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Use of Information and Communication Technology (Ict) in The Library

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Abstract

Information and Communication Technology (ICT) has transformed library services globally. Most current information are recorded in electronic format, ICT has also contributed immensely to the performance of librarians in the discharge of their duties such as in cataloguing, reference services, circulation management, serials control etc. ICT has contributed to the library in the following specific ways.

Introduction

Modern Internet is rapidly progressing beyond the creation, delivery, management and preservation of its resources to provide quality services for the humanities. The explosion of information through the WWW and human interaction through wireless devices and mobile telephony is increasing day by day ICT tools have become backbone of the human community. Computing technology, communication technology, and mass storage technology are some of the areas of continuous development that reshape the way libraries access, retrieve, store, manipulate, and disseminate information to users. ICT has impacted on every sphere of academic library activity especially in the form of the library collection development strategies, library building and consortia. ICT presents an opportunity to provide value-added information services and access to a wide variety of digital based information resources to their clients. Furthermore, academic libraries are also using modern ICTs to automate their core functions, implement efficient and effective library cooperation and resource sharing networks, implement management information systems, develop institutional repositories of digital local contents, and digital libraries: and initiate ICT based capacity building programmes for library users. Information and Communication Technology (ICT) has brought unprecedented changes and transformation to academic library and information services.

Library management software

Libraries utilizes software's designed to manage different library routines and processes. Most of these software's are integrated and have modules for the different activities or tasks carried out in the library like cataloguing, statistics, acquisition processes, serials control etc. Some examples of such software's are CDS/ISIS, GLAS, ALICE for Windows, X-Lib and SLAM. SLAM is used in the University Library FUTA and stands for (Strategic Library Automation Management).

OPAC: This means Online Public Access Catalogue and is the computerized version of the library catalogue or a database of the library holdings. The advantage of the OPAC over manual methods is ease of use and the fact that it saves space. It provides access to the catalogues of a library on the local intranet, extranet or even the internet.

Office Operations: Word processing, accounting,, database management and communication through e-mail are all enabled in the library through ICT.

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CHARACTERIZATION OF UNIFORMLY CONTINUOUS PSEUDO METRIC SPACES

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ABSTRACT

A pseudo metric space (X, d) is called a uniformly continuous if every continuous real valued function on (X, d) is uniformly continuous. In this paper we obtain the characterizations of uniformly continuous pseudo metric spaces in terms of distance between two disjoint closed sets. The precise results are as follows.

Theorem A: Suppose (X, d) is a pseudo metric space. Then (X, d) is uniformly continuous space if and only if $\bar{A} \cap \bar{B} = \emptyset \Rightarrow d(A, B) > 0$.

Theorem B: Pseudo metric space (X, d) is uniformly continuous if and only if

$$\bar{A} \cap \bar{B} = \emptyset \Rightarrow \exists \alpha > 0 \text{ such that } S_\alpha(A) \cap S_\alpha(B) = \emptyset.$$

We also obtain the sufficient condition for a pseudo metric space to be uniformly continuous. It is proved that

Theorem C: If (X, d) is a pseudo metric space such that for any two disjoint closed sets at least one is compact, then (X, d) is uniformly continuous space.

Keywords: Uniformly continuous space, Uniformly continuous function, Pseudo Metric Space.

INTRODUCTION

Let X be a pseudo metric space with pseudo metric d . Let A be any non empty subset of a pseudo metric space X . Then $S_\alpha(A) = \{x \in X : d(x, y) < \alpha \text{ for some } y \in A\}$, where α is any positive real number. Also for any A, B subsets of X , we shall denote by $d(A, B)$, the distance between two sets A and B i.e. $d(A, B) = \inf\{d(a, b) : a \in A \text{ and } b \in B\}$.

Firstly we show that in a pseudo metric space the distance between two sets is equal to the distance between their closures.

Lemma: Let (X, d) be a pseudo metric space. Suppose $A, B \subset X$ then $d(A, B) = d(\bar{A}, \bar{B})$.

Proof: As $A \subseteq \bar{A}$ and $B \subseteq \bar{B}$ then
 $d(A, B) = \inf\{d(a, b) : a \in A \text{ and } b \in B\}$
 $\geq \inf\{d(a, b) : a \in \bar{A} \text{ and } b \in \bar{B}\}$
 $= d(\bar{A}, \bar{B})$

i.e. $d(A, B) \geq d(\bar{A}, \bar{B})$.
(1)

Now we show that $d(A, B) \leq d(\bar{A}, \bar{B})$.

Let $\varepsilon > 0$ be given.

Then $\exists a \in \bar{A}$ & $b \in \bar{B}$ such that $d(\bar{A}, \bar{B}) \leq d(a, b) < d(\bar{A}, \bar{B}) + \frac{\varepsilon}{3}$ (2)

Since $a \in \bar{A}$ & $b \in \bar{B}$, $\exists a' \in A$ & $b' \in B$ such that $d(a, a') < \frac{\varepsilon}{3}$ and $d(b, b') < \frac{\varepsilon}{3}$.

$$\therefore d(A, B) \leq d(a', b')$$

$$\begin{aligned} &\leq d(a', a) + d(a, b) + d(b, b') \\ &< \frac{\varepsilon}{3} + d(\bar{A}, \bar{B}) + \frac{\varepsilon}{3} + \frac{\varepsilon}{3} \quad \text{from (2)} \\ &= d(\bar{A}, \bar{B}) + \varepsilon \end{aligned}$$

$$\text{i.e. } d(A, B) < d(\bar{A}, \bar{B}) + \varepsilon$$

Since $\varepsilon > 0$ is arbitrary, $d(A, B) \leq d(\bar{A}, \bar{B})$
(3)

From (1) and (3) we get $d(A, B) = d(\bar{A}, \bar{B})$.

Theorem 2: Let (X, d) be a pseudo metric space. Suppose $A, B \subset X$. Then $d(\bar{A}, \bar{B}) > 0$ if and only if $\exists \alpha > 0$ such that $S_\alpha(A) \cap S_\alpha(B) = \emptyset$.

Proof: Suppose $d(\bar{A}, \bar{B}) > 0$. i.e. $\inf\{d(x, y) : x \in \bar{A} \text{ and } y \in \bar{B}\} > 0$.

Put $d(\bar{A}, \bar{B}) = r > 0$. Take $\alpha = \frac{r}{2}$.

We show that $S_\alpha(A) \cap S_\alpha(B) = \emptyset$.

Suppose, $S_\alpha(A) \cap S_\alpha(B) \neq \emptyset$. Then $\exists z \in S_\alpha(A) \cap S_\alpha(B)$

i.e. $z \in S_\alpha(A)$ and $z \in S_\alpha(B)$.

Thus there are $a \in A$ and $b \in B$ such that $d(z, a) < \alpha$ and $d(z, b) < \alpha$.

$$\therefore d(a, b) \leq d(a, z) + d(z, b) < 2\alpha = r.$$

i.e. $d(a, b) < r = d(\bar{A}, \bar{B})$ where $a \in \bar{A}$ and $b \in \bar{B}$.

This gives contradiction. Thus $S_\alpha(A) \cap S_\alpha(B) = \emptyset$.

Converse: Suppose $\exists \alpha > 0$ such that $S_\alpha(A) \cap S_\alpha(B) = \emptyset$. We show that $d(\bar{A}, \bar{B}) > 0$.

Suppose this is not true. i.e. $d(\bar{A}, \bar{B}) = 0$.



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Pharmacognostic Studies on *Acacia Arabica* (Lamk.) Willd Analytical Studies

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ABSTRACT

Babool (*Acacia arabica*, Mimosaceae) is one such plant, having been prescribed for malaria, skin disease, cancer, anstringent, demulcent, aphrodisiac, anthelmintic, antimicrobial, antidiarrhoeal, colds, bronchitis and antidiabetic. This crude drug powder study was aimed to develop characteristics of powder crude methods in order to assess the quality of herbal drugs for therapeutic value. Sample subjected to various microscopical characteristics, physicochemical analysis and fluorescence test.

Keywords: *Acacia arabica*, physicochemical parameters, crude drug powder, Microscopy.

I. INTRODUCTION

Acacia Arabica (Lamk.) Willd. (Mimosaceae), known in India as Babool, is widely distributed in Punjab, Rajasthan and northern part of the India. Herbal medicine has been enjoying renaissance among the customers throughout the world. However, one of the impediments in the acceptance of the ayurvedic medicines is the lack of standard quality control profiles. The quality of herbal medicine i.e. the profile of the constituents in the final product has implication in efficacy and safety. Due to the complex nature and inherent variability of the chemical constituents of plant-based drugs, it is difficult to establish quality control parameters. To overcome these problems modern analytical techniques are expected to help in circumventing this problem (Bagul et.al 2005). Between 1999-2001 the ayurvedic pharmacopeia of India was published in three volumes, which gave the botanical identity of plants, composition, analytical procedures etc. In spite the effort made for the standardization of ayurvedic medicine, major problems remain because the formulary lists only 635 whereas the herbal medicines in actual use are believed to be at least 1000 with many regional variations (Anonymus, 1987). The absence of post market surveillance and paucity of test laboratory facilities also make the quality control of ayurvedic

medicines exceedingly difficult at this time. Therefore an attempt has been made to analyse crude drug powder of Babool (*Acacia arabica*) used in has been reported to be an antidiabetic, skin disease, leucorrhoea, antidiarrhoeal, antidyentric, antihelminthic, piles, gonorrhoea and as an antiasthmatic. (Rajvaidhya. S. 2015)

II. MATERIALS & METHODS

Plant Material: *Acacia arabica* (seed) was collected from the local region of Akola district (M.S.) and the plant material were authenticated by Dr. S. P. Rothe, Professor of Shri Shivaji College, Akola. Voucher specimen of the same have been deposited in the laboratory for future reference.

Preparation of powder: Crude drug has taken and roasted in a stainless steel pan at a low temperature till it becomes free from moisture. The sample *Acacia arabica* (seed) was powdered in a pulverizer and pass through sieve number 80#. It is packed in tightly closed containers to protect from light and moisture.

Organoleptic Evaluation: Organoleptic evaluation (Table1) refers to evaluation of formulation by colour, odour, taste, texture etc. Organoleptic characters of the

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QUALITATIVE PHYTOCHEMICAL ANALYSIS AND PHARMACOLOGICAL STUDIES OF ACACIA ARABICA (LAMK.) WILLD

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ABSTRACT

The use of plants as medicine is as old as human civilization. People of all ages in both developing and developed countries use plants in an attempt to cure various diseases and to get relief from physical sufferings. Natural products are a source for bioactive compounds and have potential for developing some novel therapeutic agents. Hence in the present study pharmacological activity, traditional benefits and phytochemical analysis of Acacia Arabica (Lamk.) willd confirms the presence of various phytochemicals like saponin, terpenoids, steroids, flavonoids, tannins, quinones and alkaloids. The result suggests that, this plant have a great potential for curing various ailments and can be source of useful drugs.

Key Words :- Acacia Arabica, phytochemical screening, pharmacological activities, traditional uses.

INTRODUCTION

Medicinal plants have been used from centuries as remedy for human diseases because they contain the compounds of therapeutic values. The plant kingdom has proven to be the most useful in the treatment of various diseases and they have provides an important source of all the words pharmaceuticals. The most important bioactive constituents of plants are steroids, terpenoids, carotenoids, flavonoids, alkaloids, tannins and glycosides. Plants in a facet of life have served a valuable starting material for drug development. (Singh V.K. et. al. 2003). Acacia Arabica (Lamk.) willd, (Mimosaceae) commonly known as Babul, Kikar or Indian gum. Arabic trees has been recognized world wide as a multipurpose trees. It is widely distributed throughout arid and semiarid zones of the world. Pods straight or slightly curved, with constrictions between the seeds giving the appearance of string. Seeds deep blackish- brown smooth, sub-circular, compressed belonging to Family Mimosaceae. (Rajvaidhya.S. et al. 2017)

MATERIAL AND METHODS

The plant material were collected from the Akola region and identified taxonomically by using standard floras (Cook 1967, Kathikeyan, Kambale & Pradhan, Naik). The fresh seeds of the plants Acacia Arabica (Lamk.) willd were air dried under the shade. The dried seeds of the plant are crushed to obtain powder. These powdered samples are then stored in air tight polythene bags protected from sunlight until used. The organic solvent like petroleum ether, alcohol, chloroform, acetone,

benzene & aqueous extracts of each sample was prepared by soaking as 1 : 10 ratio that is 3 gm of powder sample in 30 ml of organic solvents and distilled water for 18 hr. The extracts are then filtered using whatman filter paper, and used for phytochemical study.

PHYTOCHEMICAL SCREENING

Chemical test were carried out on the organic solvents & aqueous extract and on the powdered specimens using standard procedure to identified the constituents as described by Harborne (1973), Edeoga et. al. (2005) and Krishnaiah et. al. (2009).

Test for Alkaloids

To the 2-3 ml of filtrate, 1 ml of dil HCL and 1 lager's reagent was added and shake well. Yellow precipitate was formed showing the presence of alkaloids.

Test for Flavonoids

To the small quantity of extract lead acetate solution was added. Formation of yellow precipitate showed the presence of flavonoids.

Test for Steroids

To 2 ml of extract of chloroform & 2 ml of conc. H₂SO₄ was added. The solution was shaken well. As a result, chloroform layer turned red and acid layer showed greenish yellow fluorescence.

Test for Tannin

On addition of 5% FeCl₃ solution to the extract deep blue black colour appeared.

Test for Saponin

To 1 ml extract 20 ml distilled water has added and shake well in measuring cylinder. Then 1 cm layer of foam was formed.

Test for Cardiac_glycosides



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ACRIDINE SUBSTITUTED [1,2,4]-DITHIAZOLIDINES : A POTENT LARVICIDAL AND SEED GERMINATION PROMOTING AGENT

Kawle, P.R.

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ABSTRACT

The series of acridine substituted [1,2,4]-dithiazolidines have been studied for their larvicidal and seed germination promoting activity. The title compounds were prepared by interaction of 1-acridin-9-yl-3-phenyl thiourea with N-phenyl-S-chloroisothiocarbamoyl chloride by grinding method. The structures compounds were confirm on the basis of TLC and IR spectral study. The larvicidal properties were checked against mosquito larvae by taking several dilutions method mortality rate is recorded. Seed germination promoting activity of the test compounds solutions were studied using wheat grains and results clearly revealed that these compounds may acts as a seed germination promoter.

Keywords: [1,2,4]-dithiazolidines, larvicidal property, seed germination promoting activity.

MATERIAL AND METHOD

INTRODUCTION

Structural properties and various activities of dithiazolidines have been reported¹⁻³ and enriched with progressive finding about the synthesis of [1,2,4]-dithiazolidines⁴⁻⁶. The [1,2,4]-dithiazolidines have been found to possess potent anti-tumour, anti-tuberculosis anti-cancer, and anti-diabetic properties⁷⁻¹⁰. Chemical compounds such as larvicides may acts as insecticides are claimed to be a major factor behind the increase in the agricultural productivity. Nearly all insecticides and larvicides have the potential to significantly alter ecosystems¹¹.

Many of the major larvicides are inspired by chemical compounds exhibiting bio-activity and one among those is [1,2,4]-dithiazolidine, which has been extensively evaluated in this article¹². Mosquitoes are one of the deadliest insects in this planet which create biting nuisance and also transmit deadly diseases like malaria, filariasis, yellow fever, dengue, chikungunya and Japanese encephalitis etc. Therefore we made an attempt to utilize these [1,2,4]-dithiazolidines linked with acridine for their larvicidal activity.

The ability of [1,2,4]-dithiazolidines linked with acridine to act as a germination cue in many species has led to widespread interest in this aspect of seed biology. Here, we report the action of these compounds as effective seed germination promoting agents. The purpose of this brief study is an attempt to characterize the regulatory mechanism of seed germination in wheat grains¹³.

The melting points of all synthesized compounds were recorded using hot paraffin- bath and are uncorrected. Chemicals used were of A.R. grade. The IR spectra recorded on Perkin-Elmer spectrophotometer in the range 4000-400cm⁻¹ in nujol mull and as KBrpellete. Purity of the compounds was checked on silica gel-G plates by TLC.

4-acridin-9-yl-3,5-bis-phenylimino-[1,2,4]-dithiazolidine (4a): (Found: C, 68.12; N, 11.28; S, 6.98. Calcd. for C₂₇H₁₈N₄S₂: C, 70.12; N, 12.12; S, 7.14%) ; IR : 1550, 1342, 758, 483cm⁻¹ (S-S)

4-acridin-9-yl-3-phenylimino-5-o-tolylimino-[1,2,4]-dithiazolidine (4b) : (Found: C, 66.91; N, 11.68; S, 12.40. Calcd. for C₂₈H₂₀N₄S₂: C, 70.58; N, 11.76; S, 13.44%); IR: 1538, 1332, 763, 458cm⁻¹.

4-acridin-9-yl-3-phenylimino-5-m-tolylimino-[1,2,4]-dithiazolidine (4c) : (Found: C, 70.18; N, 11.70 S, 13.21 Calcd for C₂₈H₂₀N₄S₂: C, 70.58; N, 11.76; S, 13.44%); IR : 1550, 1338, 755, 470 cm⁻¹.

4-acridin-9-yl-3-phenylimino-5-p-tolylimino-[1,2,4]-dithiazolidine (4d) : (Found: C, 66.13; N, 10.89; S, 12.55. Calcd. for C₂₈H₂₀N₄S₂: C, 70.58; N, 11.76; S, 13.44%); IR : 1533, 1332, 760, 458 cm⁻¹.

4-acridin-9-yl-3-(2-chlorophenylimino)-5-phenylimino-[1,2,4]-dithiazolidine(4e) : (Found: C, 64.93; N, 11.18; S, 13.47. Calcd. for C₂₇H₁₇N₄S₂Cl : C, 65.32; N, 11.29; S, 12.90%); IR : 1550, 1338, 764, 483 cm⁻¹.



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One Step Iodine Promoted Synthesis of Imidazol-2-one and Pyrimidin-2-one

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ABSTRACT

Ecofriendly one step syntheses of symmetrical imidazol-2-ones and pyrimidin-2-ones/thiones have been reported by cyclisation of urea, thiourea, guanidine with aldehydes/ketones in presence of molecular iodine in ethanol by grinding in mortar by pestle. Symmetric bis-(2-aryl)-imidazol-2-ones and bis-(2-aryl)-pyrimidin-2-ones/thiones have been identified on the basis of IR, ¹H-NMR and mass spectral studies.

Keywords: Grindstone method, imidazol-2-one, pyrimidin-2-one.

INTRODUCTION

Green chemistry offers clean synthesis, elimination of waste, mild reaction condition which save the environment.¹ The grinding is interesting as it is performed in absence of solvent leading to safe and energy efficient synthesis. The simple mechanochemical grinding by mortar and pestle is sufficient to get the desire product called hand grindstone method or mechanochemical method.^{2,3} The molecular iodine is gaining importance as catalyst due to Lewis acid character, as its action as a condensing agent accelerates bond breaking and making in various organic transformations and cyclocondensations leading of bioactive heterocycles^{4,5}. Due to Lewis acid nature of iodine, catalytic action of iodine is observed. The atmospheric oxygen also get involved in oxidative cyclisation known to be iodine promoted oxidation.⁶

The heterocycles such as imidazol-2-one and pyrimidin-2-one have no alternate in pharmaceutical sciences involving synthesis of new bioactive heterocycles based largely on the modification of structure.^{7,8} Recently reported imidazole fused heterocycles have studied for their pharmacological action which expanded the scope in remedying various dispositions in clinical treatment includes hemeoxygenase inhibitors, antiaging, antiviral, anticancer and antimalarial properties.⁹⁻¹¹ On the other hand pyrimidin-2-ones have high pharmacological value and they are used as calcium channel blockers, neuropeptide Y antagonists (NPY).¹²⁻¹⁴



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A SIMPLE APPROACH FOR PREPARATION OF BIS-(2-ARYL)-1-H-BENZIMIDAZOLE NICKEL (II) CHLORIDE COMPLEX

PRAVIN R. KAWLE

Department of Chemistry, Shri R. L. T. College of Science, Akola-444001, Maharashtra, India

Accepted Date: 05/09/2017; Published Date: 10/10/2017

Abstract: An ecofriendly method for synthesis of bis-(2-aryl)-1H benzimidazole metal salt complexes (5a-e) have been reported by interaction of alcoholic solution of metal salt and solution of 2-(aryl)-1H-benzimidazole (3a-e) in the ration 1:2 at room temperature and stirred continuously for 72 hrs. Initially 2-aryl-1H-benzimidazole (3a-e) as ligand were obtained by interaction of diphenylamine (1) and aryl acid (2a-e) without using solvent in presence of Fe_2O_3 as a catalyst. The data obtained from the Rast's camphor method, IR and colorimetric estimation fully supported the structure of above metal salt complexes.

Keywords: Benzimidazole, heterocycle-metal salt complex

Corresponding Author: PRAVIN R. KAWLE



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**Effect of folic acid antagonist methotrexate on prostate gland of Indian Palm Squirrel *Funambulus Pennanti* (Wroughton)****Kohchale, S. R.¹ and Misar, S. D.²****Received:** August 30, 2017 | **Accepted:** October 11, 2017 | **Online:** December 31, 2017**Abstract**

The toxic effect of Methotrexate on the prostate have been studied by intramuscularly injecting low dose of 3 mg/kgBW/day and 6 mg/kgBW/day for 15 days to adult male squirrel (*Funambulus pennanti*) during the breeding period January. For comparing the effects the saline treated vehicle was injected same amount of saline and was maintained for the same duration. The low dose treatment resulted into remarkable reduction in the size of prostatic acini, with moderate or considerable increase in the intertubular connective tissue, complete vacuolation in some cells but supra and infra nuclear in most of the cells, general disturbance in the secretory epithelium lining and exfoliation of nuclei into the lumen. These sloughed off nuclei were either lying in the partially dried prostatic secretion or they were extruded along with cytoplasm in any corner of the acinal lumen. Above mentioned effects were

further enhanced with high dose as evident by total loss of secretory activity due to severe disruption of secretory epithelium, their degeneration, severe vacuolation, pyknosis of nuclei or total disintegration, general disruption in the basis architecture of the prostatic acini, enucleating of many of the cells.

Keywords: Methotrexate | toxic effects | prostate gland

Introduction

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SYNTHESIS AND SCREENING OF SUGAR HYDRAZINO BENZOTHIOZOLYL THIOCARBAMIDE FOR BIOLOGICAL STUDIED

HEDA KAVITA. M.

Department of Chemistry, Shri R. L. T. College of Science, Akola – 444001(M.S.) India

Accepted Date: 05/09/2017; Published Date: 10/10/2017

Abstract: Benzothiazoles are bicyclic ring system with multiple applications. The synthesis of novel glycosides derivatives and investigation of their chemical and biological behavior have gained more importance in recent decades. Serial of Hepta-O-acetyl- β -D-maltosyl-3-(2)-hydrazino-1,3-Substituted Benzothiazolyl thiocarbamides has been synthesized by the interaction of two pharmacophores, hepta-O-acetyl- β -D-maltosyl isothiocyanate and substituted 2-hydrazino-1,3-benzothiazoles in acetone medium. The reaction mixture was kept at room temp for 24 hrs. Acetone is evaporated then product is recrystallized by petroleum ether (60-80%). Benz-fused compounds have been employed in the synthesis of various compounds which show very potential pharmacological activities. Carbohydrate is the key element in variety of biological phenomena and its *N*-linked sugar derivatives also exhibit wide range of medicinal activities. Keeping in this view, when one biological active molecule is linked to another, the resultant molecule generally has increased potency. The identities of these newly synthesised Hepta-O-acetyl- β -D-maltosyl-3-(2)-hydrazino-1,3-Substituted Benzothiazolyl thiocarbamides have been established on the basis of usual chemical transformations and IR, ¹H NMR and Mass spectral studies. The antibacterial and antifungal activities of also reported. Some of these derivatives exhibit significant antimicrobial activity. These compounds show appreciable activity towards these microorganisms like Escherichia coli, Proteus vulgaris, Staphylococcus aureus, Salmonella typhimurium, Psudomonas aeruginosa, Aspergillus Niger and Candida albicans.

Keywords: 2-hydrazino-1,3 benzothiazole, substituted benzothiazolyl thiocarbamide, hepta-O-acetyl- β -D-maltosyl isothiocyanate, Biological studies.

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SYNTHESIS, CHARACTERIZATION AND BIOLOGICAL STUDIES OF NEWLY SYNTHESIZED 3-ARYL(NITROANILINE)-4-S-BENZYL-6-P-TOLYLIMINO-2-PHENYLIMINO-2,3-DIHYDRO-[1,3,5] THIADIAZINES[HYDROCHLORIDE]

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ABSTRACT

The progress achieved in the synthesis of heterocyclic compounds with biological potential is due to improvement of the methodological study of tested substance. Several five and six membered aromatic systems having three hetero atoms have been studied because of their interesting physiological properties. Serial of 3-Aryl(Nitroaniline)-4-S-benzyl-6-p-tolylimino-2-phenylimino-2,3-dihydro-[1,3,5] thiadiazine [Hydrochloride] has been synthesized by the interaction of 1-Aryl(Nitroaniline)-5-p-tolyl-2-S-benzyl-2,4-isodithiobiuretes with phenyl isocyanodichloride in refluxing chloroform medium. Initially evolution of hydrochloric gas to obtain 3-aryl (Nitroaniline)-4-S-benzyl-6-p-tolylimino-2-phenylimino-2,3-dihydro-1,3,5thiadiazines [hydrochloride]. Constitutions of synthesized compound have been delineated on the basis of chemical transformation, elemental determination, and IR, NMR and Mass spectral studies. These compounds were screened for their antibacterial and antifungal activities against *Escherichia coli*, *Proteus vulgaris*, *Staphylococcus aureus*, *Salmonella typhimurium*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Aspergillus Niger* and *Candida albicans*. These compounds show appreciable activity towards these microorganisms.

Keywords: 2,4- isodithiobiuretes, phenyl isocyanodichlorides, -1, 3, 5-thiadiazines, Antimicrobial Activity

INTRODUCTION

Many compounds consisting of 5-membered heterocyclic rings represent important building blocks in organic and medicinal chemistry. In addition, they are interesting in their own right, due to their pharmacological properties¹⁻³. The progress achieved in the synthesis of heterocyclic compounds with biological potential is due to improvement of the methodological study of tested substance. Several five and six membered aromatic systems having three hetero atoms have been studied because of their interesting physiological properties. Their analogues have been noted to exert a wide range of clinical applications like antifungal⁵⁻⁶, antimalarial⁷, anticancer⁸, anti-HIV-1⁹, carbonic anhydrase inhibitors¹⁰.

Thiadiazine and its derivatives are found as an important pharmacologically¹¹ and biologically active precursor in the field of heterocyclic chemistry. Some amino derivatives prove useful as herbicides, insecticides, fungicides, diuretics and antidiabetics. Organic thiocyanates¹²⁻¹⁴ and sugar thiadiazines¹⁵⁻¹⁷ also possess great potential as

carbonic anhydrase inhibitor, PET inhibitor, anti HIV agent, antitumor agent, psychotropic agent and used in treatment of breast cancer.

The heterocyclic compounds having 1, 3, 5-thiadiazine enhanced pharmaceutical¹⁸⁻¹⁹, medicinal, agricultural and industrial activities of the drugs and medicines. So the drugs or medicines containing thiadiazine nucleus are now used extensively in medical, biochemical and biotechnological faculties. The biological importance of the 1, 3, 5-thiadiazine derivatives is further emphasized by showing the presence of 1, 3, 5-thiadiazine ring in therapeutic agent

MATERIALS AND METHODS

All chemicals were research grade. Melting points determined are uncorrected. IR spectra were recorded in KBr on a FT-IR Perkin-Elmer RXI (4000-450cm⁻¹) spectrophotometer. ¹H NMR measurements were performed on a Bruker DRX-300 (300 MHz FT NMR) NMR spectrometer in CDCl₃ solution with TMS as internal reference. The Mass spectra were recorded on a THERMO Finnigan LCQ Advantage max ion trap Mass spectrometer. Optical rotation [α]_D³¹ measured on

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ROLE OF PHYSICO-CHEMICAL ANALYSIS IN SOIL QUALITY AND MANAGEMENT

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Abstract: The economies for most developing countries primarily depend on agriculture. Studying the physicochemical properties of soil is important for sustainable management of the agricultural resources and economic growth. In the present study it was preferred to investigate the soil sample for its physico-chemical analysis of some parameters. The sample was analyzed for its soil texture, soil temperature, bulk density, pH, Electrical conductivity (EC), Total organic carbon, Available nitrogen (N), Available phosphorus (P), Available Potassium (K) and Calcium carbonate CaCO₃. Characterization also helps in determining the soil potentials and identifying the constraint in crop production besides giving detailed information about different soil properties. Thus the systematic study of physico-chemical properties of the soils could help in understanding the basic characteristics of the soils and the constraints associated with the management of soils.

Keywords: Economies, Analysis

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MONITORING AIRBORNE FUNGAL MYCOFLORA IN COLLEGE LABORATORY

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ABSTRACT

Air is important part of environment. Various airborne particles are present in the environment. Air pollution is the most serious problem to human health. Aerobiological studies are important for providing qualitative and quantitative information about airborne fungal organism. The present study was conducted to analyse the mycoflora from Botany laboratory were investigated between June 2015 to May 2016. In this study, 15 species was isolated and identified from the selected laboratory. The Petri-plate expose method using PDA (Potato dextrose agar) CZA (CzapekDox Agar) media in petri-plate. 15 species were identified rest which are not identified were kept as unidentified fungi. *Aspergillusniger* (18.33%) and *Aspergillusfumigatus* (20.45%) These are the dominant species than rest of the fungi.

Keywords: PDA, CZA, Petriplate, Mycoflora, *Aspergillusniger*

INTRODUCTION

The term aerobiology was first coined by the American plant pathologist "Fred cambellmeier" in 1930. So the term aerobiology came in use since 1930 to denote the airborne fungal spores, pollen grains and other airborne microorganisms. The outdoor environment is never completely free from the incidence of microbial prop gules, which are collectively called as "air spora". The term "air spora" is suggested by Gregory in 1952. Airborne fungi, the most important group in the air, have been well known as the cause of contamination problems in the environment and in human activities. Normally, fungi as saprophytes, play a significant role as primary decomposers of substrates in various ecosystems (Nazim et al. 2012). Air is a natural medium for certain very minute particle including many mycoflora. Fungal spores constitute a significant fraction of airborne bioparticles (Meraj et al 2000, Durugbo et al 2013). Investigation on aeromycoflora in libraries was carried out in past by many workers (Ghosh et al 2014, Sinha et al 1998). Airborne mycoflora are largely determined by topography, meteorological parameters, vegetation and biotic factors including human activities (Lacey 1981). However, airborne fungi are involved in the respiratory system infections. For example, polypoid chronic rhinosinusitis has been caused by *Bipolaris spicifera* (Buzina et al. 2003), while *Aspergillus fumigatus* is associated with respiratory symptoms in patients with asthma (Fairs et al. 2013). Accordingly, the aeroallergen from

Alternaria sp. is one of main factors causing allergy in human respiration (Cordon & Millington 2001). Further, some groups of airborne fungi can grow inside office furniture and lead to exposure to volatile organic compounds (VOCs) or occupation-associated cancer epidemics due to aflatoxicosis (Gedikoglu et al. 2012). Aero mycology deals with the study of air borne fungi and their spores. Fungi have both beneficial and nuisance effect on our lives. They destroy our food, Fabrics, leather and other articles. They are also responsible for causing large number of diseases in the plants like Rust, Smut Blight, and Mosaic etc.

MATERIAL AND METHODS

The present study was conducted in college laboratories by petri plate expose method. The petri plate expose method is uses for isolation of fungal species by using PDA (Potato dextrose agar) and CZA (CzapekDox Agar) media at monthly intervals with petri-plate from June 2015 to May 2016. Petri-plate were expose in 10 minute of Botany laboratory and incubate at $30 \pm 10C$. for 4-5 days. For the species identification, specimen microscopic slide were prepared with the help of glycerine jelly as mounting media and lacto-phenol cotton blue as the standard stain.

RESULT AND DISCUSSION

Present investigation was undertaken to analysed , a total 15 species was isolated and identified the identified species were *Aspergillusniger*, *A. fumigatus*, *A. flavus*, *A. nidulans*.



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RESEARCH ARTICLE

Phytochemical screening of selected medicinal plants of the family Lamiaceae

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ABSTRACT

The members of Lamiaceae family include aromatic plants that are being used in traditional medicine for various disorders. To study the secondary metabolites present in the leaves of the family Lamiaceae (*Ocimum sanctum*, *Leonotis nepetifolia* (L.), *Mentha arvensis* L.). The samples were extracted using solvents like acetone, chloroform, ethanol, petroleum ether and water. These mixtures were shaken at room temperature for 24 h. After incubation, the extracts were filtered using Whatman No.1 filter paper, collected and stored at 4°C. Preliminary phytochemical screening was performed by standard methods. The phytochemical screening revealed the presence of alkaloids, carbohydrates, flavonoids, phytosterols, proteins, steroids, terpenoids, phenols, saponins, quinones, coumarins and glycosides. The result reveals the presence of bioactive constituents comprising alkaloids, flavonoids, phenolics, tannins, glycosides, steroids and saponins in different solvents. The presence of these phytochemicals can be correlated with the medicinal potential of this plant

Keywords: Plant material, Acetone extract, methanol extract, water extract phytochemicals

INTRODUCTION

Medicinal plants play a major role in meeting the medical and health needs of about 70% of populations in developed and developing countries, which serve as an important resource for the treatment of various maladies and illnesses (Ngari et al., 2010). Globally, about 85% of the traditional medicines used by different ethnic groups inhabiting various terrains for primary healthcare are derived from plants, especially in India; medicinal plants are widely used by all sections of the population with an estimated 7500 species of plants used by several ethnic communities (Farnsworth, 1988). The plant is being used by the local peoples and tribal of Maharashtra as ethno medicine on various ailments. This plant is also being used for its anti-inflammatory, anti-diarrheal properties by various communities in Indian subcontinent and also across the world. The present study was designed to evaluate the fundamental phytochemical constituents of this wild medicinal plant.

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A NOVEL STUDIES OF SYNTHESIS OF NANOPARTICAL OF SOME LACTOSYLATED DITHIOBIURETS AND THEIR XRD STUDIES

ASHISH G. SARAP

Department of Chemistry, Shri R. L. T. College of Science, Akola-444001, (Maharashtra) India

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Abstract: A huge number of research papers have appeared over the last decades on the application of microwave technology in organic synthesis. The chemistry of thiourea of carbohydrate is extensively elaborated and well documented. The use of microwave irradiation in organic synthesis has become increasingly popular within the pharmaceutical and academic arenas, because it is a new enabling technology for drug discovery and development. By taking advantage of this efficient source of energy, These compounds arouse interest as potential biologically active substances and versatile intermediates for preparing various derivatives. They have been found useful in the treatment of hypertension, as appetite suppressant and as a potential anti-oxidant cardio protective agent. Chemistry of sugar isothiocyanate with special reference to their utility as intermediate in the synthesis of nitrogen and sulphur containing open chain and cyclic compound. Several lactosyl dithiobiurets deravaives has been prepare by condensation of hepta-O-acetyl-B-D-lactosyl isothiocyanate with various aryl thiocarbamides by microwave method. The identities of newly synthesis compounds have been established on the basis of usual chemical transformation and IR, NMR, Mass spectral studies.

Keywords: Hepta-O-acetyl-B-D-lactosyl is thiocyanate, Aryl thiocarbamides, lactosyl dithiobiurtes.



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USE OF CLOUD COMPUTING IN EDUCATION FIELD A REVIEW

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ABSTRACT

In the present scenario, many education institutions are facing the problems with the growing need of IT and infrastructure. Cloud computing which is an emerging technology and which relies on existing technology such as Internet, virtualization, grid computing etc. can be a solution to such problems by providing required infrastructure, software and storage. Resource sharing in a pure plug and play model that dramatically simplifies infrastructure planning is the promise of "cloud computing". The two key advantages of this model are ease-of-use and cost-effectiveness.

In this paper a basic research has been carried out to show cloud computing can be introduced in the education field to improve teaching – learning process effectively. The requirement of current demand of infrastructure as well as softwares which is fulfilled by cloud computing and bring a revolution in the field of education.

Keywords: Cloud Computing, e Learning, Saas, IaaS, PaaS

INTRODUCTION

Cloud computing is a complete new technology. It is the development of parallel computing, distributed computing, grid computing, and is the combination and evolution of Virtualization, Utility computing, Software-as-a-Service(SaaS), Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS). cloud computing provides shared resources, software and information through Internet as a PAYGO (Pay-as-you-go) basis. Cloud computing can be a welcomed option in the universities and educational institutes for higher studies. It gives a better choice and flexibility to the IT departments by building multipurpose computational infrastructure once and then uses it for several purposes for several times. Evolution of cloud computing number of services have migrated from traditional system to the online form. At present many institute are updating their IT infrastructure and data and facing some challenges which can be solved by cloud computing.

CLOUD COMPUTING CHARACTERISTICS AND BENEFITS

Cloud computing boasts several attractive benefits for organizations i.e. business as well as educational and end users. Main benefits of cloud computing are:

- Self-service provisioning: End users can spin up compute resources for almost any type of workload on demand. This eliminates the traditional need for IT

administrators to provision and manage compute resources.

- Elasticity: Companies can scale up as computing needs increase and scale down again as demands decrease. This eliminates the need for massive investments in local infrastructure, which may or may not remain active.
- Pay per use: Compute resources are measured at a granular level, enabling users to pay only for the resources and workloads they use.
- Workload resilience: Cloud service providers often implement redundant resources to ensure resilient storage and to keep users' important workloads running -- often across multiple global regions.
- Migration flexibility: Organizations can move certain workloads to or from the cloud -- or to different cloud platforms as desired or automatically for better cost savings or to use new services as they emerge.

TYPES OF CLOUD COMPUTING SERVICES

Cloud Providers offer services that can be grouped into three categories.

1. Software as a Service (SaaS): In this model, a complete application is offered to the customer, as a service on demand. A single instance of the service runs on the cloud & multiple end users are serviced. On the customers side, there is no need for upfront investment in servers or software



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SYNTHESIS AND CHARACTERIZATION OF POLYANILINE NANOWIRES BY A NOVEL ELECTROCHEMICAL POLYMERIZATION TECHNIQUE.

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ABSTRACT

In the present work, we study the electrochemical behavior of polyaniline nanowires (PANINW) which is synthesized by two step galvanostatic technique on platinum as working electrode in three electrode system. During deposition of PANI, various process parameters viz. concentration of dopant, applied current density and the time of deposition were optimized. The surface morphology was characterized by Scanning probe technique viz. Atomic Force Microscopy (AFM). Polyaniline nanowire grown with diameter 130 nm and length 535 nm.

Keywords: Polyaniline nanowires, two step galvanostatic technique, surface modification.

I. INTRODUCTION

In the present day its important to monitor our environment which can produce adverse effect on flora and fauna. Therefore scientist were attracted towards the Conducting polymers due to its ease of synthesis, low power consumption, tunable conductivity [1 - 3]. Different polymerization techniques evolved in which conducting polymer synthesized by chemical oxidative polymerization which require large amount of times to carry out the reaction with the help of oxidizing agent but it is helpful to synthesize the thin film as well as an interfacial polymerization technique is utilize to produced composite film of polyaniline with the help of oxidizing agent which is quite tedious to carry out [4, 5] . Nanowires grown by template synthesis [6, 7]. PANINWs synthesize by three

step electrochemical polymerization [8, 9] but Shirsat etal synthesize and bridge polyaniline nanowires between the gap of two gold microelectrodes, by simple tow step galvanostatic technique without using oxidant with less reaction time [10].

In present work, keeping the idea of two step electrochemical polymerization, PANINWs synthesize and grown on platinum working electrode (vs Ag/AgCl reference electrode). and topographical image PANINWs is recorded by Atomic Force Microscopy (Park XE 7). The electrochemical characterization performed by utilizing CH 600C electrochemical work station. A single compartment of three electrode cell containing platinum plates of dimensions 20 * 10 *0.5 mm³ were used as working & counter electrodes and saturated Ag/AgCl used as reference electrode. In electrolyte preparation aniline monomer prior to used distilled once and stored in cold environment were purchase from Sigma Aldrich. The reagent used as hydrochloric acid (HCl) of laboratory grade. In the electrolyte preparation 1 M of HCl is added drop wise with continuous stirring in 0.5 M of aniline for half an hour. This solution is used for electrochemical deposition and growth of PANINWs on platinum working electrode at room temperature.

II RESULT AND DISCUSSION:

PANINWs synthesized by two step electrochemical polymerization technique. In the first step applying constant current density of 0.9 mA/cm² for 20 minutes to introduced PANI nuclei on to the platinum working electrode, at

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SYNTHESIS AND CHARACTERIZATION OF L-VALINE CAPPED SN DOPED CUO NANOPARTICLES

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Abstract

We report synthesis, structural and linear optical properties of L-valine capped undoped and Sn doped CuO nanoparticles (NPs). Sn doped (1, 2 and 5 wt%) CuO NPs were obtained by chemical co-precipitation method and were calcined at 500°C for 2h. X-ray diffraction (XRD) shows formation of crystalline CuO having monoclinic phase with average particle size of 10nm. Ultraviolet-visible (UV-vis) spectroscopy attests the formation of NPs and strong blue shift in the excitonic absorption has been observed for both uncalcined and calcined NPs. All samples show broad excitonic absorption in the wavelength range 351-654nm. This broad range of absorption may be due to inter band surface states transitions in CuO NPs.

Keywords: CuO nanoparticles, L-valine, XRD, UV-vis.

1. Introduction

Nanostructured materials offer great advantages over bulk materials owing to enhanced properties due to high surface to volume ratio and quantum size effects [1-3]. Metal Oxide or Semiconducting and Metal nanomaterials are known to have peculiar shape and size dependent physical, chemical, electrical and optical properties which can be

engineered as per application requirements [4]. These nanomaterials are widely used in optoelectronics, electronics, medicine, photonics etc. Third order nonlinearity in semiconducting materials is gaining extreme importance because of its potential applications in optical switching, optical limiters, optoelectronic devices, optical signal processing, optical waveguides, ultrafast optical communication systems, optical storage systems, ultrafast NLO devices, etc [5]. Nano crystalline CuO semiconductor is one of the best promising materials as it has potential applications in optics and optoelectronics. Copper oxide is an excellent nanoparticles system for investigating the size induced structural transformations and phase stability. CuO is a p-type semiconductor having direct bulk energy gap of about 1.85 eV at room temperature [6-8]. The effect of doping on properties of CuO nanostructures are being studied widely for many practical applications like an efficient catalytic agent, gas sensing material, lithium batteries, solar cells, optical switches, magnetic storage media, etc [9-12]. Effects of dopant and capping agent on semiconductor oxide nanoparticles have been reported in our previous works [13-18]

2. Materials and methods

Undoped and Sn doped CuO nanoparticles were synthesized by wet chemical method. All chemicals of analytical reagent grade were used as received without further purification. Copper (II) chloride dihydrate (CuCl₂·2H₂O, 99.99%),

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POLYANILINE THIN FILM SYNTHESIS AND CHARACTERIZATION BY A NOVEL ELECTROCHEMICAL POLYMERIZATION TECHNIQUE.

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ABSTRACT

In the present work electrochemical behavior of polyaniline (PANI) thin films which is synthesized by galvanostatic technique on platinum substrate as working electrode in three electrode system. During deposition of PANI, various process parameters viz. concentration of dopant, time of deposition and applied current density were optimized. Surface morphology was characterized by Scanning probe technique viz. Atomic Force Microscopy (AFM) which confirms the deposition of thin films and chemical composition verified by Fourier Infra Red (FTIR) Spectroscopy.

Keywords: Polyaniline Thin films, galvanostatic technique, surface modification, Atomic Force Microscopy, Fourier Infra Red Spectroscopy

INTRODUCTION

In this era world is going to developed due to liberalization, Privatization and globalization which can produce adverse effect on flora and fauna. So it is very important to nurture the nature for our future. Therefore scientists were attracted towards the Conducting polymers which can play a vital role to monitor the environment due to its ease of synthesis, low power consumption, tunable conductivity [1 - 5] conducting polymer synthesized by chemical oxidative polymerization techniques [6, 7] which require large amount of times to carry out the reaction with the help of oxidizing agent but it is helpful to synthesize the thick film as well as in interfacial polymerization technique is utilize to produced composite film of polyaniline with the help of oxidizing agent which is quite tedious to carry out [8]. PANI films synthesize by electrochemical polymerization techniques [9, 10]

In present work, keeping the idea of one step electrochemical polymerization technique by lower applied current density, PANI thin film synthesize and deposited on platinum working electrode (vs Ag/AgCl reference electrode) and topographical image PANI thin film is recorded by Atomic Force Microscopy (Park XE 7). The electrochemical characterization performed by utilizing CH 600C electrochemical work station. A three electrode cell containing platinum plates of dimensions 20 * 10 *0.5 mm³ were used as working & counter electrodes and saturated

Ag/AgCl used as reference electrode. In the preparation of electrolyte, aniline monomer distilled once prior to used and stored in cold environment were purchase from Sigma Aldrich. The reagent used as hydrochloric acid (HCl) of laboratory grade. In the electrolyte preparation 1 M of HCl is added drop wise with continuous stirring in 0.1 M of aniline for half an hour. This solution is used for electrochemical deposition of PANI thin films on platinum working electrode at room temperature

RESULT AND DISCUSSION

PANI thin films synthesized by galvanostatic electrochemical polymerization technique by applying constant current density of 0.0417 mA/cm² for 20 minutes to introduced PANI nuclei on to the platinum working electrode, at this current density effective potential at working electrode at which anodic peak potential remains at 0.77 v (vs Ag/AgCl reference electrode). After anodic peak there is a decrease in potential which confirms a uniform polymerized mass of PANI deposited on platinum working electrode. In the process of deposition, first the oligomers with smaller in size are deposited on the working electrode which acts as a seeds and help to deposited PANI polymers on the platinum working electrode. The modification in the topographic surface of the substrate after deposition of PANI thin film on working electrode is confirmed by Atomic Force Microscopy (AFM).



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INVESTIGATION OF RHIZOSPHERE MYCOFLORA FROM SOME MEMBERS OF SOLANACEAE FAMILY

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ABSTRACT

Soil fungi play an important role as major decomposers in the soil ecosystem. The rhizosphere is an area of soil showing microbiological activity, which is slightly away from root system of the growing plants. The Rhizosphere soil is said to have a lower pH, lower water and oxygen pressure & high levels of carbon dioxide than the bulk soil. Rhizosphere mycoflora directly or indirectly inhibits the invasion of plant tissue by the pathogen, and synthesis of growth-controlling plant hormones such as Indole, 3-Acetic Acid and Giberellic acid. Considering these activities of rhizosphere mycoflora, present investigation is carried out with some members of family Solanaceae, like *Capsicum annum*, *Lycopersicon esculentum* and *Solanum melongena* cultivated in Gadchiroli district of Maharashtra state, India.

Keywords: Rhizosphere, mycoflora, Solanaceae, Soil fungi, *Solanum melongena*.

INTRODUCTION

Soil is a complex heterogeneous habitat for a wide variety of organisms including bacteria, fungi, protozoa, nematodes and earthworms in which organisms interact with each other and with their physical environment contributing to plant nutrition, soil structure, soil fertility, decomposition of organic matter, cycling of nutrients, suppression of soil born pathogens and removal of toxins (Prescott et al., 2005; Kirk et al., 2004; Kozdroj & Van Elsas, 2000; Dawar et al., 2014). Involvement of soil

microorganisms are in a wide variety of metabolic and physiological activities that influence the microhabitat (Dawar et al., 2014). Soil fungi play an important role in nutrient cycling, plant health & development (Thorn, 1997; Dawar et al., 2014).

Soil fungi play an important role as major decomposers in the soil ecosystem. They also provide mankind with very useful pharmaceutical products, such as antibiotics & other valuable substances, including organic acids, enzymes, pigments and fermentation. In addition, many soil fungi are biological control agents for plant pathogens and insect pests. On other hand, some of them are very harmful causing food spoilage and diseases to plants, animals, and humans with significant economic losses and produce mycotoxins in certain products.

The term Rhizosphere was first proposed by Hiltner in 1904. And according to him, rhizosphere is a portion of the soil which is adjacent to the root system of a plant and is influenced by the root system of a plant. The rhizosphere is an area of soil showing microbiological activity, which is slightly away from root system of the growing plants. The width of this zone of soil varies with the type, age of plant & with soil environmental conditions. Rhizosphere microflora differs from plant to plant.

The Rhizosphere soil is said to have a lower pH, lower water, oxygen pressure & high levels of

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WEEDS OF AGRICULTURE FIELDS IN KHARIP AND RABI SEASON AND THEIR CONTROL MEASURES IN GADCHIROLI DISTRICT OF MAHARASHTRA STATE, INDIA

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ABSTRACT

Plants play a vital role in maintaining an ecological balance and improving livelihood of peoples. They perform many physiological activities which create an environment suitable for other organisms. But, there are some (native or invasive) plants which expand in particular area and suppress the growth of native plants and causes localize extinction of native species. These plant species exhibit rapid growth and produce dense monocultures, they are known as **weeds**. India is the world's second largest producer of rice, wheat and cotton after China; and the second largest producer of sugarcane, after Brazil. But, weeds are one of the major biological constraints that limit crop productivity. Considering the above concern, present investigation was carried out in Kharip (monsoon) and Rabi (winter) seasons, in different areas of Gadchiroli district of Maharashtra state. The present investigation was conducted during the months of July to May. Frequent field trips were arranged to various parts of the district to collect weed species in different crops. From the survey, total 37 species of weed plants reported in both Kharip and Rabi seasons. Different control measures were applied to control different weeds, of which chemicals (herbicides) are considered to be best to eradicate weeds. However, herbicides may cause inadvertent/unintentional injury to crop and other non-target vegetation in an area by faulty application techniques.

Keywords- Agricultural weeds, Control, Kharip, herbicides, Glyphosate, 2,4-D.

INTRODUCTION

Plants are the essential components of life form on earth. Plants play a vital role in maintaining an ecological balance and improving livelihood of peoples. They perform many physiological activities which create an environment suitable for other organisms. One of such physiological activity is photosynthesis which provides food for insects, birds, animals and human being too. Plants maintain the balance in environment by taking up Carbon dioxide and releasing Oxygen in air, which is vital for survival of all organisms. But, there are some (native or invasive) plants which expand in particular area and suppress the growth of native plants and causes localize extinction of native species. These invasive plant species can invade a particular zone of the depth profile and suppress the native plant species that normally inhabit the area. When these invasive plant species exhibit rapid growth and produce dense monocultures they are known as **weeds**.

India is seventh largest country in the world and second largest country in Asia by concerning about geographic land. Where, agriculture continues to be the backbone of the economy as it employs 54.6% of the total work force. Out of India's total cropped area of 192 million ha, less than one-half is under irrigation. The Indian agricultural production system has a challenge to

feed 17.5% of the global population with only 2.4% of land and 4% of the available water resources at its disposal.

Ever since the Green Revolution, begin in 1960s, Indian rice and wheat systems have been playing a critical role in the global food economy. The food, primarily rice, produced by India supports the local population of 1.25 billion besides other millions of people in Asian and African countries by way of exports (Bumeya and Ramanathan 2014). India has set a growth target of 4% for the agriculture sector during the 12th Plan period of 2012-2017 (Planning Commission 2013). But, there are number of plants which invades crop fields and causes loss of millions of tons of agricultural products. These plants invading the crop fields are known as **agricultural weed** or **crop weed**. This emphasizes the need for constant efforts to increase crop productivity and production to meet the demands of increasing population by developing and extending climate-resilient technologies for agricultural and horticultural crops. So, efforts must take into consideration to manage weeds, which adapt well to grow in both unfavourable and favourable environments and cause yield and quality loss, while competing with crops for resources (Rao and Nagamani 2010).

In India, weeds are one of the major biological constraints that limit crop productivity. They



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Seasonal incidence of pathogenic disease Grasserie in silkworm Bombyx mori in Vidarbha region (Maharashtra)

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Abstract

The survey of Grasserie diseases of silk worm was carried, during the year 2010-11, and 2011-12 through 5 districts (Akola, Amravati, Buldhana, Washim and Yevatmal) of Western Vidarbha regions in Maharashtra. As many as 250 silkworm rearing centers located in various villages. The incidence of Grasserie varies seasonally. During Both study year 2010-11 and 2011-12 the incidences of Grasserie in monsoon season was higher. The district wise incidence during 2010-11 in Monsoon was reported as, Akola 7.65%, Yevatmal 7.28 % Amravati 7.12 Washim 6.82% Buldhana 6.61%. in post monsoon it was, Washim 6.1% Akola 5.78% Amravati 5.12% Buldhana 4.98 % Yevatmal 4.21%, in winter season it was recorded as Yevatmal 7.01% Buldhana 6.75 % Akola 6.63% Amravati 6.12% Washim 5.71 and in spring season the incidences of Grasserie was reported as Amravati 7.51% Akola 7.23% Buldhana 7.12% Yevatmal 7.11% Washim 7.08% During 2011-12 the incidences of Grasserie in monsoon season reported as Amravati 7.64 % Akola 7.42% Yevatmal 7.31% Buldhana 6.44% Washim 6.49%, in post monsoon season was as Washim 6.32% Amravati 5.75% Akola 5.64 Buldhana 4.75% Yevatmal 4.47% winter season was Yevatmal 7.12% Akola 6.32% Amravati 6.24% Buldhana 6.17 Washim 5.47 % and in spring season was Amravati 7.75% Buldhana 7.57% Akola 7.21% Washim 7.24% Yevatmal 7.17.

The silkworm, *Bombyx mori* is a purely domesticated insect since 4,500 years but like other domesticated animals it is a quite delicate venture and might be easily susceptible to a number of diseases, most of which develops seasonally^{6,9}. Seasonal occurrence of disorders and diseases is a periodic surge in disease incidence, corresponding to seasons or other calendar periods. All animals, including man, and insects have their own specific seasonal diseases, which usually emerge at

the time a species becomes so abundant in a particular phase of year, that it menace the affluence of the coming generations¹¹.

Grasserie is one of the most serious diseases in tropical countries, though occurs throughout the year, intensity varied with seasons. It is also known as the 'hanging disease'. *Borrelina Bombycis* virus, of the family Baculoviridae causes this disease. The Baculoviridae comprises only 2 genera

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Seasonal Incidence of Pathogenic Disease Flacherie in Silkworm *Bombyx Mori* in Vidarbha Region (Maharashtra)

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ABSTRACT

The survey of Flacherie disease on silk worm was carried out, during the year 2010-11 through 5 districts (Akola, Amravati, Buldhana, Washim and Yavatmal) of Western Vidarbha regions in Maharashtra. As many as 250 silkworm rearing centers located in various villages were surveyed. The incidence of Flacherie reported to varies seasonally. During study year the incidences of Flacherie in spring and monsoon season was higher. The district wise percent incidence in Monsoon season was reported as, Akola 8.0 %, Amravati 7.5 % Buldhana 7.1 %, Yavatmal 6.8 % Washim 6.2 % , in post monsoon it was, in Amravati 5.8 %, Akola 5.5 %, Washim 5.1 %, Buldhana 4.9 %, Yavatmal 4.8%, in winter season it was recorded as Akola 3.4 %, Amravati 3.1 %, Washim 2.99%, Buldhana 2.86 %, Yavatmal 2.49 % and in spring season the present incidence of Flacherie was reported as Washim 8.66 %, Akola 8.56 %, Amravati 8.21 % , Buldhana 7.56 %, Yavatmal 7.23 % .These results are discussed.

Key words *Flacherie, Vidarbha, Bombyx mori*
Densonucleosis virus (BmDNV),
Streptococci species, Staphylococci species

The silkworm, *Bombyx mori* is a purely domesticated insect since 4,500 years but like other domesticated animals it is a quite delicate venture and might be easily susceptible to a number of diseases, most of which develops seasonally (Govindan and Devaiah, 1998 ; Prasad, 1999). Seasonal Occurrence of disorders and diseases is a periodic surge in disease incidence, corresponding to seasons or other calendar periods. All animals, including man, and insects have their own specific seasonal diseases, which usually emerge at the time a species becomes so abundant in a particular phase of year, that it menace the affluence of the coming generations (Rane, 1911).

Flacherie is caused by both bacteria and viruses individually or in combination. Viral and Bacterial Flacherie is common in silkworms and tend to occur in the hot and humid summer and autumn rearing seasons (Lu Yup-Lian and Liu-Fuan, 1991). The disease causing bacteria are mainly *Streptococci species* and *Staphylococci species*, also *Streptococcus faecalis*, *Streptococcus faecium* as well as *Bacillus thuringiensis*. The viruses causing the pathogenicity to silkworm are *Bombyx mori* Densonucleosis virus (BmDNV). Earlier study of silkworm pathogenic diseases in India during the last four decades was conducted by Pringle, (1984) and claimed that these may vary from season to season and in different agro

climatic conditions. Srivastava and Kumar (2009) mentioned seasonal incidences of Bacterial Flacherie and cytoplasmic polyhedrosis and claimed to cause losses up to 48.9 and 35.4 per cent respectively to the commercial silkworm crop growers. Though Vidarbha region in Maharashtra is known as cotton producing region, nowadays farmers in many areas, are diverted in opting rearing of mulberry silkworm, using CSR2 and Kolar gold breeds of silkworm *Bombyx mori*, and taking commercial crops of silk round the year but also regularly facing the problems of incidence of various pathogenic diseases including Flacherie. This disease has never been studied and reported before, particularly from the Western Vidarbha region, in Maharashtra.

MATERIAL AND METHOD

With due consent of the farmers in Akola, Amravati, Buldhana, Washim and Yavatmal districts of Western Vidarbha regions in Maharashtra, a season wise survey was conducted during the year 2010-11. As many as 250 silkworm rearing centers located in various villages were surveyed, in the study districts, for incidence of bacterial and viral Flacherie disease in silkworm. The experimental survey was done following the method of Bontha Kasi Reddy and Krishna Rao (2009). All the centers were visited during Monsoon, Post monsoon (Autumn season), winter season and spring season. Silkworm infected with disease, often manifest characteristics symptoms and signs of diseases, hence the identification of worms infected with the bacterial and viral Flacherie in the fields initially was made on the basis of gross pathology at fifth instars larval stage. During every visit, prevailing ambient temperature and relative humidity was determined and recorded. The number was recorded throughout the rearing period in different seasons. The observations on incidence of disease were made by recording the number of healthy and diseased larvae during the course of rearing and the incidence percentage for the disease was calculated by using the following formula.

Table 1. (% Seasonal incidence of Flacherie on mulberry silkworm in Vidarbha region of Maharashtra 2010-11

Seasons → District ↓	Monsoon	Post monsoon	winter season	spring season
Akola	8	5.5	3.4	8.56
Amravati	7.5	5.8	3.1	8.21
Buldhana	7.1	4.9	2.86	7.56
Yavatmal	6.8	4.8	2.49	7.23
Washim	6.2	5.1	2.99	8.66



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Haemolymph response in silkworm *Bombyx mori*, during infection with Grasserie

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ABSTRACT

Haemolymph is a multifunctional circulatory fluid in the body of silkworms, consisting of liquid plasma and many types of nucleated haemocytes, which are classified into Prohaemocytes (PR), plasmatocytes (PL), granulocytes (GR), spherule cell (SP), and Oenocytes (OE). During infection, pathogens utilize haemolymph as a medium for maintenance and proliferations, affecting not only total haemocyte count (THC), and differential count of haemocyte, but also the haemolymph volume. The present paper deals with these responses of haemolymph in fifth instar silkworm *Bombyx mori* larvae during infection with Grasserie disease. For the present study haemolymph was collected on day two and day five of infected 5th instar larvae, with a cut through one of the prolegs and using prescribed methods, proceeded for hematological examination. In the results we reported, significant decrease in total haemocyte count in the infected worms when compared to healthy worms. With progress of Grasserie, we observed a decrease in differential count of Prohaemocytes (PR) and Oenocytes (OE), while there was an increase in the differential count of plasmatocytes (PL), granulocytes (GR), and spherule cell (SP). Grasserie infection also found to influence the total haemolymph volume and causes reduction in haemolymph volume of infected silkworms over the control. The results obtained are discussed in the light of patho-physiology of larval silkworms during infection.

Key words: *Silkworm, infection, haemocytes, Haemolymph, Grasserie*

Introduction:

The silkworm, *Bombyx mori* is a purely domesticated insect since 4,500 years but like other domesticated animals it is a quite delicate venture and might be easily susceptible to a number of diseases, most of which develops seasonally (Govindan and Devaiah, 1998 and Prasad, 1999). Grasserie is one of the most serious diseases of silkworms, though occurs throughout the year, its intensity varied with seasons. It is also known as the 'hanging disease'. Caused by *Borrelina Bombycis* virus, of the family Baculoviridae causes this disease. The seasonal infection of Grasserie causes patho-physiological changes, at both early and late stages of disease attack. In this infection the virus multiplies and forms polyhedra in the nucleus of infected cells. Haemolymph is a circulatory fluid in the body of insects and performs many diverse functions (Mullins, 1985), and consists of liquid plasma and many types of nucleated haemocytes, which are classified into granular haemocytes, spherule cells, oenocytoids, prohaemocytes and plasmatocytes (Arnold and Hinks, 1976). Being the major circulating body fluid haemolymph fills the body cavity or haemocoel (Chapman, 1969) bathing the tissues directly. Investigations on haemolymph give idea about pathophysiological changes associated with the different processes involved in resistance to disease. Hemocytes are the major constituents in haemolymph, move and perform various physiological functions in the body of insect including defense against the pathogen and toxins in the body. Their variety and population index is very important. The most abundant haemocyte types typically described in Lepidopteron larvae are granular cells and plasmatocytes, which are capable of adhesion and phagocytosis of pathogenic agents (Levine and Strand, 2002). Monoclonal antibodies are

very useful reagents for distinguishing lepidopteron haemocyte populations based on antigenicity rather than morphology, (Willott *et al.*, 1994) which can vary considerably, especially for plasmatocytes. On incidence of infection the haemolymph as well as the tissues gets affected and shows alterations (Watanabe, 1971). The investigation of changes in haemolymph is an appropriate system for studying effects of infectious disease. Hence we carried out the present study to understand the specific responses of haemolymph during attack of Grasserie disease.

Material and Methods:

Collection:

With due consent of the owners of the local sericulture units, healthy and infected silkworms with Grasserie were collected on the basis of gross pathology in their early infection (first 2nd day of fifth instar) and late infection (6th day of fifth instar) states. Fresh haemolymph was collected from all the diseased larvae and from the healthy non infected larvae at same developmental stages, following the methods of Jalal and Rasoul (2010).

Methodology:

Total haemocyte count (THC): Haemolymph was drawn into a the pipette up to 0.5 mark and diluted up to the 11 mark with Toisson's solution (NaCl- 1.0gm, Na₂SO₄ - 8.0gm, Neutral glycerin - 20ml, Methyl violet - 0.025 gm, Distilled water - 160ml).

Neubauer ruling of Haemocytometer was flooded with diluted haemolymph and the hemocytes counted in its four corner and one central squares under a microscope.

The number of haemocytes per cubic millimeter (mm³) was calculated using the following formula of Jones (1967).



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Hemolymph Glucose Dynamism in Silkworm *Bombyx mori* Infected with Grasserie and Flacherie

Rashmi. P. Joshi, I. A. Raja

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Abstract The effects of infectious diseases Grasserie, viral and bacterial Flacherie on hemolymph glucose were examined in the hemolymph of fifth instar larvae at early and late experimental stage. The hemolymph collected from the control non infected healthy worms and that from the diseased worms. We reported that relative to controls, early infection with Grasserie slightly altered the hemolymph content of the glucose, in all the experimental worms. However a marked decrease in glucose level with the advancement of the infection on 5th day of the fifth- instar silkworms infected with Grasserie, viral Flacherie and bacterial Flacherie was noticed. This decrease in glucose contents was much higher in silkworm infected with bacterial Flacherie. The decreased reported, could be due to the utilization of less food material, reduced rate of conversion and metabolism.

Keywords Hemolymph, Silkworm *Bombyx mori*, Grasserie, Flacherie, Glucose.

Introduction

Silkworm, *Bombyx mori* is a purely domesticated insect since 4,500 years, but like other domesticated animals it become quite delicate venture and might be easily susceptible to a number of diseases, causing great economic loss. Pathogenic diseases like Grasserie and Flacherie are common and vary seasonally in Vidarbha region of Maharashtra [1], high temperature and the dry climatic conditions of the district are conducive to the incidence of these diseases. The pathogens causing Grasserie and Flacherie, usually enter per orally through the contaminated food into the alimentary canal and penetrate midgut wall and then to the hemolymph. Hemolymph is the first line of pathogenic attack through midgut. Therefore study of hemolymph is significant in monitoring and control of diseases at early stages, most of which develops seasonally [2, 3]. All animals, have their own specific seasonal diseases, which usually emerge at the time a species becomes so abundant in a particular phase of year, that it menace the affluence of the coming generations [4].

Though major biomolecules such as carbohydrates, proteins and lipids take active part in physiological process underlying growth and development, they also help to resist the stress and disease. Alterations in the carbohydrates of a silkworm plays vital role in the interface between the host and disease pathogens as a part of survival approach including physical defenses.

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Study of DC Conductivity of Polypyrrole doped with SnO₂ Nanocomposites

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ABSTRACT

The nanocomposites of PPy-SnO₂ were prepared by chemical oxidative polymerization technique using an anhydrous ferric chloride (FeCl₃) as an oxidizing agent and it was characterized by X-ray diffraction (XRD), field emission scanning electron microscope (FE-SEM), Fourier transform infrared (FTIR). The samples are prepared in the form of thick films by screen printing method. The effect of temperature on DC conductivity of the samples has been measured and the conductivity of sample PS3 (60 % PPy + 40 % SnO₂) was found to be maximum amongst all the prepared samples. Activation energy was found to be 0.1062 eV.

Keywords: PPy-SnO₂ nanocomposites, DC conductivity.

I. INTRODUCTION

Recently, the conducting polymers are important materials emerging with lot of applications in various fields. To improve the quality and applicability the research in the field of such polymers with some modification of existing polymers has been carried out. Some of these modifications involve preparing hybrid materials in which organic materials and inorganic oxides or salts of different metals, viz. SnO₂, ZnO, MgO etc. [1]. The most widely studied conducting polymers are polypyrrole, polyaniline, polythiophene etc. Additionally, PANI can coordinate with metal ions, giving the multi-metallic system and also preparation of nanocomposite materials with other polymers. PPy is one of the most interesting conducting polymers since it is easily deposited from aqueous and non-aqueous media, very adherent to many types of substrates, and is well-conducting and stable. Electrochemical polymerization produces thin films with a thickness of few micrometers on an electrode surface, while a chemical oxidation yields fine-grained materials [2-4]. PPy is known to be

capable of storing electrical charges. The stored electrical charges can be recovered upon demand and that is why PPy can be considered as a good candidate for super-capacitor application [5-8].

The present study deals with the synthesis & characterization of PPy/SnO₂ composites and evaluation of dc conductivity for different wt. % of SnO₂ in PPy nanocomposites with an intention to know the effect of SnO₂ doping. The characterization of the composites has been done by SEM analysis techniques.

II. EXPERIMENTAL

A. Synthesis of SnO₂ nanoparticles.

All the chemicals used in this study were of GR grade purchased from Sd-fine, India (purity 99.99%). In preparation of SnO₂, 2g (0.1 M) of stannous chloride dehydrate (SnCl₂·2H₂O) is dissolved in 100 ml water. After complete dissolution, about 4 ml ammonia solution is added to above aqueous solution with magnetic stirring. Stirring is continued for 20 minutes. White gel precipitate is immediately formed.

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Analysis of Bacteriological Parameters of Public-Water Supply In Daryapur And Anjangaon Tahshil And Calculate Percentage Of Contaminated Water in 2017-18

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Abstract- A total of 3028 drinking water samples have been amassed aseptically in sterilized field from different public water resources in Daryapur and Anjangaon tahshil. Over a period of twelve month April 2017 to March 2018. Most probable number (MPN) check turned into completed to locate the coliforms in consuming water samples. The MPN number became very high (≥ 180) of fantastic water samples. And evaluate the odds of contamination in every month for the duration of take a look at and calculate the percentages of infection of water pattern.

Key Words: Drinking water sample, MPN count, Coliforms, Public.

INTRODUCTION

Water is one of the maximum essential and plentiful compounds of the atmosphere. All living organisms on the earth need water for their survival and boom. The safety of drinking water is an ongoing concern within the global village. Traditionally, the safety of potable water supplies has been controlled by disinfection, usually by chlorination and coliform population estimates. However, it has been reported that coliform-free potable water may not necessarily be free of pathogens [1]. Although water is vital for life, it also serves as the commonest route of transmission of a number of infectious diseases. Thus, water quality must be ensured before drinking and the water we drink must be safe. Safe drinking water is defined as water with microbial, chemical and physical characteristics that meet WHO guidelines of national standards on drinking water quality [2]. The use of these unsanitary sources helps to explain why 90% of human infections in less developed countries are caused by water borne diseases [3]. But due to increased human population, industrialization, use of fertilizers in the agriculture and man-made activity it is highly polluted with different harmful contaminants. Therefore it is necessary that the quality of drinking water should be checked at regular time interval, because due to use of contaminated drinking water, human population suffers from varied of water borne diseases. It is difficult to understand the biological phenomenon fully because the chemistry of water reveals much about the metabolism of the ecosystem and explain the general hydro relationship [4].

The micro-organisms in water are capable of causing various diseases like typhoid, cholera, diarrhea, dysentery, hepatitis etc. According to WHO [5], unsafe water supply is a major problem and fecal contamination of water sources and treated water is a persistent problem worldwide. Globally, 1.1 billion people rely on unsafe drinking water sources from lakes, rivers and open wells. The majority of these are in Asia (20%) and Sub-Saharan Africa (42%) [6-7]. Nearly 90% of diarrheal-related deaths have been attributed to unsafe or inadequate water supplies and sanitation (WHO, 2004) conditions affecting a large part of the world's population [8]. An estimated 1.1 billion persons (one sixth of the world's population) lack access to clean water and 2.6 billion to adequate sanitation [9-8]. Water also supports all forms of life and affects our health, lifestyle, and economic well being [10]. Good Quality of Drinking water is very necessary for improving the life of people and to prevent from diseases [11].

Total coliforms (TC) were used as an indicator of drinking water since the early 1900s and are commonly used in testing waste water. However, new research has shown that total coliforms are not useful as an indicator of fecal contamination in drinking water, and they have no sanitary or public health significance [12]. Originally, total coliforms included four groups of bacteria: *Escherichia*, *Klebsiella*, *Enterobacter* and *Citrobacter*. These four groups are found in the feces of warm-blooded animals, including humans.

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FACILE SYNTHESIS OF CHALCONE DERIVATIVES AND THEIR CHARACTERIZATION

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ABSTRACT

Much research has been carried out with the aim to discover the therapeutic values of chalcone derivatives. The presence of reactive α,β -unsaturated keto group in chalcones is found to be responsible for their biological activity. The derivatives of chalcones were prepared using Claisen-Schmidt condensation scheme with appropriate acetophenone and benzaldehyde derivatives in presence of base and ethanol at room temperature. The yield of the compound was found to be good. The characterizations of the compound have been confirmed by IR spectroscopy, ^1H NMR spectroscopy, TLC method and Melting point.

Keywords: Chalcone derivatives, Claisen-Schmidt condensation

INTRODUCTION

The chemistry of chalcones has generated intensive scientific studies throughout the world. The name "Chalcones" was given by Kostanecki and Tambor. Chalcones are also known as benzyl acetophenone or benzylideneacetophenone. Chalcones (trans-1, 3-diaryl-2-propen-1-ones) are α, β -unsaturated ketones consisting of two aromatic rings (ring A and B) having diverse array of substituents. Chalcones have been used as intermediate for the preparations of compounds having therapeutic value. Chalcones have been identified as interesting compounds that are associated with several biological activities. The most common chalcones found in foods are phloretin and its glucosidephloridzin (phloretin 2'-O- β -glucopyranoside), and chalconaringenin. Chalcone derivatives shows inhibitory effect against *M. Gypsum* species of fungus. These are naturally occurring compounds exhibiting broad spectrum biological activity including anticancer through multiple mechanism. Lots of derivatives can be synthesised and were biologically screened for antifungal activity. It also possesses wide range of pharmacological activity such as antibacterial, antituberculosis, antigout, antiinflammatory, antiplasmodic, etc. The chemistry of chalcone remains as a fascination among researchers in 21st century due to large number of replaceable hydrogen atoms that allows a large number of derivatives and a variety of promising biological activity to be generated. The presence of reacting α,β unsaturated keto group in chalcones is found to

be responsible for their biological activity. The derivatives of chalcone were prepared using Claisen-Schmidt condensation scheme with appropriate acetophenone and aldehyde derivatives.

EXPERIMENTAL

Determining the melting point of a compound is one way to test if the substance is pure. So, melting point of the compound has been taken in an oil bath using thermometer. IR spectral data were recorded on FTIR-RX1 spectrophotometer. ^1H NMR data were measured using CDCl_3 solvent on 300 MHz frequency. And their chemical shift values (δ) are in (ppm) units using TMS (Tetramethylsilane) as an internal standard. The reaction progress has been monitored by Thin Layer chromatography (TLC) using 3:1, Hexane :Ethyl acetate solvent system and spots of the compound was visualised using iodine chamber and KMnO_4 spray.

METHOD OF PREPARATION

In a 250 ml conical flask placed in an ice bath KOH (1.2 eq.) was dissolved in ethanol (50ml). thenacetophenone derivatives (1 eq.) was added slowly to the reaction mixture with continue stirring using magnetic stirrer. After 20 minutes Benzaldehyde (1 eq.) derivative was added slowly to the reaction mixture. Then reaction mixture was kept for 12-16 hrs with constant stirring at room temperature. Finally work up with water recrystallized it by ethanol. The residue obtained



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Original research article

Comparative study of nano-sized Al_2O_3 powder synthesized by sol-gel (citric and stearic acid) and aldo-keto gel method

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ABSTRACT

Inorganic Al_2O_3 nano-powders were synthesized by citric acid sol-gel, stearic acid sol-gel and aldo-keto gel method. The prepared samples were characterized by X-ray powder diffraction (XRD) for structural studies and the average particle size was calculated by Debye-Scherrer formula. The optical investigation was done through UV-vis and FL spectra analysis. The fluorescence properties were studied by fluorescence spectrophotometer (F-7000), indicating the emission of radiation of 397, 399, 401 nm by stearic acid sol-gel, aldo-keto gel and citric acid sol-gel method respectively, when nano powder absorbed UV radiation at 224 nm. However, it is found that blue shift in band gap was observed in stearic acid sol-gel, aldo-keto gel and citric acid sol-gel method respectively.

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1. Introduction

Aluminum oxide (alumina, Al_2O_3) is one of the most useful oxide ceramics. It has several advantages over other ceramics such as its thermal, chemical, and physical properties when compared with several ceramic materials. These attractive properties of Al_2O_3 make it as a most studied oxide material. The Al_2O_3 is widely applicable in firebricks, abrasives and integrated circuit (IC) packaging [1,2]. It has been used in many fields of engineering such as coatings, heat-resistant materials, abrasive grains, cutting materials and advanced ceramics. This is because alumina is hard, highly resistance towards acids and bases, permit very high temperature applications and has very good wear resistance [3–5].

Nano-sized powders have been attracted much attentions due to their wide applications in the various field. There are several methods for synthesis of nano-alumina [3,6–9], and these are categorized into chemical and physical methods. Tok et al. [3] reported flame spray pyrolysis method to synthesized agglomerate-free nano-sized Al_2O_3 particles with a size range of 5–30 nm. Shizhong et al. [10] reported nano-sized Al_2O_3 powder synthesized by thermal Metal Organic Chemical Vapor Deposition (MOCVD) combined with plasma. Rodica et al. [11] discussed synthesis and characterization of alumina nano-powder obtained by sol-gel method.

Among the several methods, in our work we use gel methods for synthesize nano-sized Al_2O_3 powder. To our best knowledge these methods are novel namely stearic acid sol-gel method, citric acid sol-gel method and aldo-keto gel method for preparation of nano-sized Al_2O_3 and also their comparative study of structural and optical properties was done.

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Microcontroller Based TechIye System for Obstacle Detection & Ranging To Assist Blind Person

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Abstract:
 Science is the greatest gift given to man, as it helps him to overcome all his problems. It makes his life easy. It is a gift from the scientific community. This gift is particularly came up to him as it makes his life at a blind person more easy. My device TechIye which stands for Technology Eye enables the blind person to know his her surroundings. And he/she can act accordingly. TechIye will prove to be the best assistant to that blind person.

Introduction:
 Currently blind people are facing a huge problem when they are in a public place. They have stick in their hand which helps them a bit. But I modified that stick and installed ultrasonic sensors along with necessary hardware in it. Which helps the blind person more effectively. It lets him sense the surrounding up to a radius of 2 meters (which can be extended as per the need) and the device has proven as the best assistant for the blind person as per the real time survey blind schools.

The TechIye enables the blind person the sense the surrounding and act accordingly. Once he/she starts using it, they feel no need of human assistance.

My first objective is to provide an easy way of detecting obstacles to blind people while walking. Secondly I had to design a low cost i.e. economical instrument for the blind people which they could afford. The design of the instrument should be simple to operate and easy to use for the blind people. The instrument must give fairly accurate results while detecting the obstacles. The instrument must work for a long time on the portable and rechargeable battery. And lastly, the instrument must work long life and to the fullest possible utility.

Block Diagram



Block diagram of TechIye System for Obstacle Detection & Ranging To Assist Blind Person

- 1) - dedicated Working of the System
- 2) The system works as given below:
- 3) So to help socially I designed a microcontroller based system. The system uses Ultrasonic Waves to detect obstacles around the blind person

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Application of Advanced Technology to enhance the performance of Wrestlers

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Introduction:

Wrestling is oldest and ancient sport in global. Wrestling is the oldest form of fight with wild animals and opposite group of enemy. Stone Age man needed to enhance physical fitness of him with wrestling practice for bodily fight with enemy and wild animals. Wrestling called the father of all sports activities. Huge history of Wrestling with good records and evidences are available for our references. The first real lines of the development of wrestling date again to the instances of the Sumerians, 5000 years in the past. Wrestling turned into the decisive area of the Pentathlon in ancient Olympic recreation from 708B.C.

Wrestling is a traditional and ancient sport of India. Indian wrestling has a top notch records. In India wrestling is referred to as 'Malla-Yudhha'. The facts approximately wrestling is determined in the excellent epic of Indian records. Indian wrestling can be divided into 4 categories i.e. Hanumanti, Beemaseni, Jamuvanti and Jarasandhi Wrestling. Now Indian Wrestlers are finished such a lot of medals in International and Olympic wrestling tournaments.

The use of era has completely changed the sport of wrestling. It became only some years ago that wrestling changed into in its "darkish age" length; information was not as without problems accessible and it become extremely hard to live concerned with the sport as a fan or competitor. Over the previous couple of years, although, it has become a good deal less difficult to follow activities, preserve track of the today's news, and most significantly, progress one's typical talent. Below, this guide will provide an explanation for a few methods you can use generation to stay concerned with the sport you like.

Purpose:

To find out latest information about how cans a use of Advanced Technology is useful to develop Wrestling Skills.

In this modern era following advance or modern technologies are used by wrestlers to develop their wrestling skill, knowledge and achieve the high level of their performance.

Video of latest techniques

The web is a first-rate situation to be taught new expertise and broaden your overall technical potential. Years in the past, the one location a wrestler would have access to educational movies had been through purchase from camps, magazines, and so forth. Now, wrestlers are competent to entry a huge style of tactics totally free through simply browsing via the internet.

There are also a few web pages committed to supplying you with high-degree systems and knowledge from a variety of coaches and wrestlers as a way to charge you. Even though such offerings can show valuable in case you have the money, they may be able to also be very high priced. If you know the way to browse the web for wrestling videos, finding some recent procedures every as soon as in a even as gainer's price you a penny. For example, the Sport videos page presents the very best of system-founded videos offering one of the most world's high-quality coaches and wrestlers...and all without cost!

Although there are probably hundreds of thousands of tutorial movies on the net in these days, now not all potential or approaches may be right for you. When deciding on up a procedure from the internet, always speak to your instruct about it or exhibit your instruct the video you watched. If he thinks the manner could advantage you, he'll help you improve this procedure and show you when and how to use it in blend with other potential

Analyzing Movie

With the rise of private video recording contraptions, documenting and inspecting suit photos has been some of the main ways to increase a wrestler's technical ability. Over the last few years, digital video recorders have come to be more low-priced, making the method of recording and reviewing match pictures much less complicated.

Mobile phone phones have further revolutionized the system of filming and inspecting suits. Now, high-fine digital recorders will also be located in most phones and wrestlers may just without



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Healthy Diet affects the Youth

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Abstract:

Today in modern era, every minute of fraction worldwide knowledge in every field is changing rapidly. Youths are facing a problem of non availability of regular timings related to proper diet, rest, sleep, fitness, vast study, competitive examination deep study to grab job opportunities and recreational activities i.e. Sports, Music, Reading, Cultural Activities etc. Healthy diet definitely boosts youth to actively participate in each and every activity to progress in his future life. The purpose of this study is to find out can Healthy Diet affect the Youth. Youth are defined as those aged 15 to 29 in the national youth policy (2014). Youths have so many problems out of these some are unavoidable but due to tremendous changes in life so sometimes youth cannot be able to avoid or solve these problems. In that condition youth wants extra support, energy or guidance to overcome this situation. Healthy diet habits improve our physical fitness and level of energy for struggle. A physical Fitness concept includes physical strengths, mental stability, psychological alertness and handle to every problematic situation. Now a days, youths are closer to junk food. We must encourage youth to take vitamins rich foods and proper healthy diet related to their activities or body requirements on proper time. The present study suggest requirement of Healthy Diet for youths to helps for physical fitness and affect to sort out problems strongly with the help of physical fitness components.

Key words: Youth, Healthy Diet, Physical Fitness

Introduction:

Today in modern era, every minute of fraction worldwide knowledge in every field is changing rapidly. In this situation everybody is facing problems in surviving in this modern and changeable lifestyle. Lifestyle is totally changed and time management is totally disturbed. As per general opinion maximum persons have no time to thinks about their self related to proper diet, rest, sleep, fitness and recreation etc.

Youths are facing a problem of non availability of regular timings related to proper diet, rest, sleep, fitness, vast study, competitive examination deep study to grab job opportunities and recreational activities i.e. Sports, Music, Reading, Cultural Activities etc. Youth must prove his talent, skill and capacity to work in any field in any condition otherwise he will be finished. Now days' every field of jobs or working areas wants young and dynamic youth.

Diet is an important factor for all around development of Youth. But it is very important to know that which type of diet is healthy for our body as per our present jobs, work, activities or study. Healthy diet definitely boosts youth to actively participate in each and every activity to progress in his future life.

Purpose:

The purpose of this study is to find out Healthy Diet affect the Youth.

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**Biological Aspects of Mycophagous Thrips *Elaphrothrips procer* (Schmutz)
(Thysanoptera: Phlaeothripidae)**

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Abstract

Thrips shows some remarkable structural peculiarities in their behaviour and life history which unobserved among the other insects. In most species of mycophagous thrips fertilization of the eggs is by means of bisexual union. Elaphrothrips procer (Schmutz) express specific biological aspects of life history and developmental stages. This paper represents some biological aspects of reproductive biology and developmental stages of mycophagous thrips Elaphrothrips procer (Schmutz).

Key words: Elaphrothrips procer, developmental stages, mycophagous thrips.

Introduction:

Insect Thrips shows wide range of distribution and ecological habitat. They occur on the tender, succulent parts of the plants, under the barks of dead and drying twigs, among decaying leaves of grass, feeding on fungus spores and hypae. They are phytophagous predators and mycophagous.

The studied insect Thrips, *Elaphrothrips procer* (Schmutz) is a mycophagous thrips and feeds on fungal spores and generally occurs on the fungus infected dry leaves of *Butea monosperma* plant during humid seasons of the year. They are found within the curved folds of fungal infected dry leaves of the said plant.

Materials And Methods:

Collection and rearing of thrips:

The thrips were collected from their host plant *Butea monosperma* dry fungal infected leaf during the humid periods of the year when they mostly occur. For collection of these species the methods of Ananthakrishnan (1969) was followed

The collected specimens of *Elaphrothrips procer* (Schmutz), adult male, female, larvae and eggs were kept in large plastic bowls along with fungus infected dry leaves. Then they transfer to the separate plastic rearing bowl to avoid overcrowding and food limitation. The newly hatched larvae were regularly fed on fungus infected dry leaves of *Butea monosperma*. For protection bowls were covered by muslin cloth. Light 12.12 and temperature (25±10°C) were maintained. Relative humidity maintained at 80% by keeping wet filter paper in the rearing bowl, some time wet cotton plug also used.

Field Observation and photo-micrograph:

For field photography and documentation, images were captured directly by using Olympus digital camera (SP-5500Z). Photographs of adults, eggs, larvae, prepupa and pupa were capture and photographs of mating behaviour were also imaged.

Results And Discussion:

Biological aspects:

Oviposition behaviour.



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**AFM STUDY OF EGG SAC SILK FIBERS OF THE GIANT WOOD SPIDER,
NEPHILA PILIPES (ARANEAE, ARANEIDAE)**

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ABSTRACT

Silk production from the abdominal silk glands is unique to spiders which have made them successful in any habitat on the earth surface. Various kinds of silk producing glands in spider function as small biofactories. The egg sac silk is produced from the cylindrical glands by female *Nephila*, immediately after egg laying. In the present work, atomic force microscopy was used as a qualitative measurement tool for determining the microscale topography and a quantitative tool for the surface nanostructure of egg sac silk fibers of *Nephila pilipes*. Two dimensional deflection images of egg sac silk fibers were recorded in contact mode. Image analysis was performed with WSxM Nanoscope image processing software. The topography of egg sac silk fibers is not uniform. Patches of this silk thread showed alternate smoother and rougher surface. Such structure increased the surface roughness of these fibers and might have assisted the spiderlings in attaching themselves. Roughness analysis of egg sac silk suggested that, this biomaterial has high toughness that may be suitable for dissipating high amounts of mechanical energy. Also, nanocrystalline and amorphous regions in spider silk fibers enrich them with strength and elasticity. This study of structure–function relationships can guide the production of high quality and smart bio-material with recombinant DNA technologies.

Keywords: *Nephila pilipes*, Egg sac silk, AFM

1. Introduction

All spiders produce protein-based biopolymer in the form of silk. Spider silk is known for its outstanding properties. Due to its desirable properties, spider silk is studied intensively to better understand the interplay between its structure and performance. Li et al. (1994) used atomic force microscopy to study the three-dimensional nanometer scale structure of dragline silk of *Nephila clavipes* from microtomed sections of the silk. Trancik et al. (2006) used Transmission Electron Microscopy and x-ray diffraction to examine the nanostructure of spider dragline silk from cob web weaving spider, *Latrodectus hesperus*. Benmore et al. (2012) performed total x-ray scattering experiments of dragline silk from *Nephila clavipes*, *Argiope aurantia* and *Latrodectus hesperus*. Jeffery et al. (2018) overviewed experimental and computational studies that have provided a wealth of detail at the molecular level on the highly conserved repetitive core and terminal regions of spider dragline silk. Most of the studies are focused on study of dragline silk.

Immediately after egg laying, egg sac is constructed by female spider. All spiders package their eggs in silken egg sacs, or cocoons to protect them against physical and biotic threats, create a suitable microclimate both for embryonic development and hatching, and protect early postembryonic stages until they leave the cocoons (Gheysens et al., 2005). In order to understand what makes egg sac silks mechanically superior, it is necessary to understand its structural organization and properties. AFM is a nondestructive technique which can provide rich topographic images of the silk fiber. The micrometer and nanometer

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Orb Web Features of Giant Wood Spider Nephila Pilipes

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Abstract

Orb webs are composite structures built from multiple types of silks, each with its own unique molecular structure and mechanical function. Nephila spiders are the eminent silk craftsmen among arachnids and are best known for producing aerial orb webs. Female giant wood spider Nephila pilipes builds highly efficient and specialized aerial trap in the form of planar and vertical orb web. Orb web features and web architecture parameters like web asymmetry, hub displacement, ladder index, average mesh height and web area of female Nephila pilipes web were studied. The architecture of orb webs clearly influence the types of prey ultimately captured and consumed by spiders. Hence, we concluded that larger asymmetrical orb webs might be interpreted as increased foraging effort. A tight and nearly uniform mesh provides more silk per unit area for kinetic energy absorption as well as more stickiness per unit area and may well result in more effective snare for relatively larger prey.

Key words: Nephila pilipes, orb web, web architecture

Introduction

Spider webs are supreme examples of evolution in animal architecture. These are becoming a focus of biological and interdisciplinary research (Agnarsson et al., 2010) with web architecture. Spider webs have inspired numerous biomimetics material and structural designs in the fields of architecture (Burkhardt, 2016). The orb webs of spiders are perfect geometrical architectural models (Pasquet et al., 2013). Nephilid genera construct webs of exaggerated proportions, which can be aerial, arboricolous or intermediate (Kuntner et al., 2018). The orb webs like that of the golden orb weaver Nephila pilipes are examples of animal design that can be studied in great detail, both for web building behaviour and web architecture. The webs are especially well-made, as they are meant to last for long time. More importantly, since these spiders are found in sub tropical regions, their insect prey is naturally larger than insects in other regions. While webs are designed to catch large insects like grasshoppers, butterflies, moths etc. Orb webs are more appropriately distinguished from other types of spider webs in their suspension in the air column upon discrete networks of frame threads.

Material And Methods

Web architecture and features of orb web of Nephila pilipes were studied in natural habitat. Our study area was the woods of Melghat (21°26'45"N 77°11'50"E 21.44583°N 77.19722°E). Web architectures of spiders were recorded in the field by using a FUJIFILM FINEPIX 52000HD 10.0 MEGA PIXELS 15x wide digital camera. In order to increase visual contrast, webs were dusted with cornstarch. We observed, studied and measured a randomly encountered sample of 30 webs of Nephila pilipes from forest area of Gullarghat in the months



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Analysis of drug ofloxacin in bulk and single component pharmaceutical tablets by non-aqueous potentiometric titration method

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Analysis of drug ofloxacin in bulk and single component pharmaceutical tablets has been carried out by non-aqueous potentiometric titration method using isopropyl alcohol as the solvent and KOH in isopropyl alcohol as the titrant. The effect of solvent and concentration on potentiometric analysis of drug ofloxacin as well as its analysis in bulk and single component pharmaceutical tablets has been studied by using a pair of glass and calomel electrode. The method was found to be quite simple, efficient, precise and gave results comparable to those obtained by Indian Pharmacopoeia (I.P.) method.

Keywords: Analysis, non-aqueous, potentiometric titration, ofloxacin.

Introduction

Analysis of various drugs by non-aqueous potentiometric titration method using different electrode pairs has been reported earlier¹. Numbers of methods for the determination of drug ofloxacin are reported literature². Its estimation by potentiometry and conductometry has been reported earlier by few workers³. It has been also determined by spectrophotometric, spectrofluorometric methods⁴ and analyzed by high pressure liquid chromatography with column switching⁵. Ofloxacin is distinctly acidic and it could not be titrated directly with aqueous alkali owing to its easy hydrolysis. The basic titrant is also superior to the alkoxide solvents which are more susceptible to the atmospheric moisture and carbon dioxide. The purpose of present work is to find out simple analysis method for common pharmaceutical drugs. It will help to analyze raw materials and products for quick check of spurious drugs that are feared to penetrate the markets. In this communication, analysis of drug ofloxacin in bulk and single component pharmaceutical tablets by non-aqueous potentiometric titration method using isopropyl alcohol as the solvent and KOH in isopropyl alcohol as the titrant has been reported. The study of effect

of solvent and concentration on potentiometric analysis of drug ofloxacin has also been attempted.

Results and discussion

Study of effect of solvent and concentration on potentiometric analysis of ofloxacin:

In the study of effect of solvent, accuracy of results in analysis of drug ofloxacin by using different solvents was checked by non-aqueous potentiometric titration method. The required volumes of stock solutions of drug ofloxacin in different solvents were diluted to 20 ml and then titrated separately with KOH in isopropyl alcohol. It can be seen from the results that, accuracy of result in analysis of ofloxacin by using solvent isopropyl alcohol is much more with minimum % error as compare to other solvents (Table 1). The potentiometric breaks obtained using the solvents dimethyl formamide and acetone are smoother one as compared to methanol whereas the potentiometric break obtained using isopropyl alcohol is much more pronounced and prominent with maximum potential difference near the equivalence point (Fig. 1). The dielectric constant of isopropyl alcohol is smaller than dimethyl formamide, methanol and acetone. It permitted a large change in the solvated pro-



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Assessment of Ground Water Quality of Agricultural Land for Irrigation Purpose in Some Villages of Akola District of Maharashtra, India**Pradip P. Deohate***

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ABSTRACT: Assessment of ground water quality of agricultural land for irrigation purpose in Gram-Kolvihar, Kumbhari and Shivapur of Akola district of Maharashtra, India was carried out to evaluate the factors regulating ground water quality. Total fifteen samples of the ground water were drawn from the open wells in the month of September-2017 and analyzed for various physico-chemical parameters such as temperature, colour, pH, EC, alkalinity, chloride, sulphate, calcium, magnesium, sodium, potassium, TDS, COD, DO and BOD. Sodium hazard associated with the irrigation water was judged using SSP and SAR criteria. Results obtained were compared with the Bureau of Indian Standards (BIS) limits. Almost all the samples were found to be suitable for the irrigation purposes based on the irrigation quality parameters.

Keywords: Assessment; ground water quality; agricultural land; irrigation and Akola.

INTRODUCTION: Ground water is the major source for irrigation in India. Quality of irrigation water is a crucial factor for long term soil productivity and it depends on the concentration of dissolved constituents present in water, depth of water table, topography, climate, composition of soil etc. Quality of water is an important consideration for appraisal of salinity in an irrigated area. Good quality water has the potential to cause maximum yield whereas poor quality water can develop various soil and cropping problems. Hence special management practices may then be required to maintain full crop productivity. The poor quality water may affect irrigated crops by causing accumulation of salts in the root zone, by causing loss of permeability of the soil due to excess sodium or calcium leaching or by containing pathogens or contaminants which are directly toxic to plants or to those consuming them. Contaminants in irrigation water may accumulate in the soil and after a period of years render the soil unfit for agriculture.

Quality of irrigation water is mostly judged by some determining factors such as soluble sodium percentage (SSP) and sodium absorption ratio (SAR).¹⁻⁵ It also depends upon temperature, colour, hydrogen ion concentration (pH), electrical conductivity (EC), alkalinity (HCO_3^{2-} , CO_3^{2-} , OH^-), chloride (Cl^-), sulphate (SO_4^{2-}), calcium (Ca^{2+}), magnesium (Mg^{2+}), sodium (Na^+), potassium (K^+) present in water. Total

dissolved solids (TDS), chemical oxygen demand (COD), dissolved oxygen (DO) and biological oxygen demand (BOD) also affects the quality of water.⁶⁻⁹

The study of physico-chemical characteristics of water of various dams, canals, rivers, wells used for irrigation of agricultural land in various regions of India was carried out earlier by many co-workers. Literature is enriched with the determination of various parameters of irrigation water.¹⁰⁻¹⁵ In present work, assessment of ground water quality of agricultural land for irrigation purpose in some villages of Akola district of Maharashtra, India was carried out.

MATERIAL AND METHODS: The present study of assessment of ground water quality of agricultural land of some villages in Akola district of Maharashtra, India for irrigation purpose was carried out in the month of September-2017. The physico-chemical parameters like temperature and colour of ground water utilized for purpose of irrigation were measured at the site itself. The pH was measured using digital pH-meter (Systronics-MKVI) with glass as an indicator electrode and saturated calomel as a reference electrode. The EC was checked by digital conductivity meter (Systronics-304) using conductivity cell (K=1). Dissolved salts i.e. SO_4^{2-} was analyzed by using spectrophotometer (Systronics-166)



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Determination of Physico-Chemical Parameters of Ground Water Used for Irrigation in Villages of Akola District of Maharashtra, India

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ABSTRACT: Determination of physico-chemical parameters of ground water used for irrigation in Gram-Babhulgaon and Chandur of Akola district of Maharashtra, India was worked out to evaluate the factors that regulate ground water quality. In the month of February-2016, ten ground water samples from open wells were assessed for parameters i.e. temperature, colour, pH, EC, alkalinity, chloride, sulphate, calcium, magnesium, sodium, potassium, TDS, COD, DO and BOD. Using SSP and SAR criteria, sodium hazard associated with the irrigation water was evaluated. Results were compared with Bureau of Indian Standards (BIS) limits. Based on the irrigation quality parameters, most of the samples were found to be suitable for irrigation.

Keywords: Determination; physico-chemical parameters; ground water; irrigation and Akola.

INTRODUCTION: In India ground water is the major source of irrigation. For long term soil productivity, irrigation water quality is an important factor and it depends on percentage of constituents that dissolved in water, water table depth, climate, soil composition, topography etc. In irrigated areas, water quality is an important factor for appraisal of salinity. Good quality water has potential to give maximum yield whereas poor quality water may cause accumulation of salts in root zone, decreases soil permeability because of excess sodium or calcium leaching and affects irrigated crop by containing pathogens or contaminants that are directly toxic to plants or to those consuming them. Contaminants present in irrigation water may accumulate in soil and after some years make the soil unfit for agriculture use. Hence to maintain full crop productivity it is essential to have special management practices.

Irrigation water quality depends on temperature, colour, hydrogen ion concentration (pH), electrical conductivity (EC), alkalinity (HCO_3^{2-} , CO_3^{2-} , OH^-), chloride (Cl^-), sulphate (SO_4^{2-}), calcium (Ca^{2+}), magnesium (Mg^{2+}), sodium (Na^+), potassium (K^+) present in water. It is judged by some determining factors such as soluble sodium percentage (SSP) and sodium absorption ratio (SAR).¹⁻⁵ Quality of water also get affected by the presence of total dissolved solids (TDS), chemical oxygen demand (COD), dissolved oxygen

(DO) and biological oxygen demand (BOD).⁶⁻⁹ Assessment of physico-chemical parameters of water of dams, rivers, canals, wells used for irrigation in different regions of India was studied earlier by many co-workers.¹⁰⁻¹⁵ In this study, determination of physico-chemical parameters of ground water used for irrigation in villages of Akola district of Maharashtra, India was worked out.

MATERIALS AND METHODS: Present work of determination of physico-chemical parameters of ground water used for irrigation in villages of Akola district of Maharashtra, India was carried out in the month of February-2016. Temperature and colour of ground water were checked at the site itself. pH was measured by pH-meter (Systronics-MKVI) having glass and saturated calomel electrode. EC was checked using conductivity meter (Systronics-304). Dissolved salts i.e. SO_4^{2-} was estimated using spectrophotometer (Systronics-166) while Na^+ and K^+ were detected by flame photometer (Systronics-130). Other parameters i.e. HCO_3^{2-} , CO_3^{2-} , OH^- , Cl^- , Ca^{2+} , Mg^{2+} , COD, DO and BOD were determined by standard titrimetric methods.¹⁶ TDS present in irrigation water was also checked. SSP and SAR are the most common criteria for evaluation of sodium hazard associated with irrigation water.^{4,5} All weighings were done on electronic balance, Precisa-310-M (± 0.001 g). Chemi-



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Non-Aqueous Potentiometric Analysis of Drug Furosemide in Bulk and Single Component Pharmaceutical Tablets

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Abstract

Non-aqueous potentiometric analysis of drug furosemide in bulk and single component pharmaceutical tablets was performed by using the solvent isopropanol and titrant KOH in isopropanol. Effect of solvent and concentration on non-aqueous potentiometric analysis of drug furosemide and its estimation in bulk and single component drugs was studied using a glass and calomel electrode pair. The method of non-aqueous potentiometric titration was found to be simple, accurate and coherent. Results obtained are comparable to that of Indian Pharmacopoeia (I.P.) method.

Keywords: Non-aqueous, potentiometric, analysis, drug furosemide.

Introduction

Non-aqueous potentiometric analysis of various drugs using varied electrode pairs has been reported earlier in the literature¹⁻⁵. Literature is enriched with number of methods of analysis of drug furosemide^{6,7}. Its determination by potentiometric technique has been reported earlier by some researchers⁸. Spectrophotometry, spectrofluorometry, colorimetry, reversed phase liquid chromatography methods were also used for analysis of this drug⁹⁻¹¹. Drug furosemide is distinctly acidic. It could not be titrated directly with aqueous alkali because of its easy hydrolysis. Basic titrant is superior to the alkoxide solvents which are more susceptible to carbon dioxide and atmospheric moisture. The aim of present work is to find out basic, accurate method for analysis of commonly used pharmaceutical drugs which will be helpful in determining the raw materials and products for instant check of spurious drugs that are feared to penetrate the markets. In present communication, non-aqueous potentiometric analysis of drug furosemide in bulk and single component pharmaceutical tablets using solvent isopropanol and titrant KOH in isopropanol has been reported. Effect of solvent and concentration on potentiometric analysis of drug furosemide has also been studied.

Results and Discussion:

Effect of solvent and concentration on potentiometric analysis of drug furosemide.

Accuracy of results in determination of drug furosemide by using different solvents was checked by non-aqueous potentiometric titration method. Required volumes of stock solutions of drug furosemide in various solvents were diluted to 20 ml and separately titrated with KOH in isopropanol. It was found that, accuracy of result in analysis of drug furosemide by using solvent isopropanol is much more as compared to other solvents with minimum % error (**Table 1**). Potentiometric breaks obtained using solvents dimethyl formamide and acetone are smoother as compared to methanol whereas using isopropanol, potentiometric break obtained is much more pronounced and prominent with high potential difference near equivalence point (**Graph 1**). Dielectric constant of isopropanol is less than dimethyl formamide, methanol and acetone. It permitted a large change in the solvated proton concentration near the end point. Isopropanol can be purified and made anhydrous very easily as compared to other solvents.

To determine suitable concentration range that gives best results, different volumes of stock solution of drug furosemide were diluted to 20 ml with isopropanol and separately titrated with KOH in isopropanol. It was found that, potentiometric method gave an accuracy of $\pm 0.5\%$ for the range of 3.310 to 33.100 mg. Results obtained are much more accurate as compared to



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Non-aqueous potentiometric determination of drugs mefenamic acid and paracetamol-mefenamic acid in single and double component pharmaceuticals

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The non-aqueous potentiometric determination of drugs mefenamic acid and paracetamol-mefenamic acid has been worked out. These drugs are widely used in medicines either as a single component or in combination of two. The effect of solvent and concentration on determination of drug mefenamic acid along with its determination in single component tablets and paracetamol containing double component tablets has been studied using the solvent isopropanol and titrant KOH in isopropanol. The acidic drugs paracetamol-mefenamic acid were simultaneously determined in double component tablets by differentiating potentiometric titrations. Titrations were carried out using a pair of glass and saturated calomel electrodes. This method was found to be quite simple, efficient, precise and convenient for assay of single and double component tablets. The results obtained are comparable to those obtained by Indian Pharmacopoeia (IP) method.

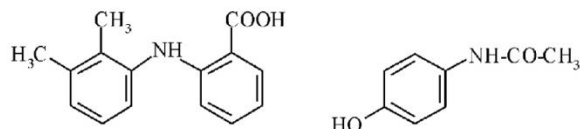
Keywords: Non-aqueous, potentiometric, mefenamic acid, paracetamol-mefenamic acid.

Introduction

The non-aqueous potentiometric determination of various pharmaceutical drugs has been reported earlier using different electrode pairs¹. Several methods have been reported for the determination of drug mefenamic acid in single component form and majority of these are spectrophotometric². However, these methods are very much non-selective and time consuming. The estimation of drug mefenamic acid by colorimetry, voltammetry, potentiometry and polarography was reported earlier³. It has been also analyzed by atomic absorption spectrometry, gas liquid chromatography and capillary electrophoresis technique⁴.

Different methods have been suggested for the determination of drugs in double or triple component dosage form and mostly involved the separation of components followed by their estimation using suitable method⁵. Pharmacopoeias include the methods for determination of drugs in combination⁶. Literature is enriched with spectrophotometric determination of drugs paracetamol-mefenamic acid in double component form⁷. These drugs in combinations were analyzed by reversed phase ultra performance liquid chromatography, high performance thin layer chromatography and ¹H NMR spectroscopy⁸. Although different methods have been evaluated and utilized for the determination of drugs,

however, very little work is available on the direct estimation of drugs by non-aqueous potentiometric titrations. As the drugs mefenamic acid and paracetamol are distinctly acidic, could not be titrated directly with aqueous alkali due to their easy hydrolysis. The basic titrant KOH in isopropanol is also superior to the alkoxide solvents which are more susceptible to the atmospheric moisture and CO₂.



The present communication deals with the non-aqueous potentiometric determination of drugs mefenamic acid and paracetamol-mefenamic acid in single and double component pharmaceuticals. The effect of solvent and concentration on potentiometric analysis of drug mefenamic acid has been also studied. In double component tablets, determination of one component in presence of other was carried out without any prior separation. In all non-aqueous potentiometric titrations, isopropanol was used as the solvent and KOH in isopropanol as the titrant. Present work is aimed at finding out simple analysis procedure for common drugs



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Microwave Irradiative Synthesis of Triazine Substituted Pyrazoles and Study of Antitubercular and Antimicrobial Activities

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Microwave irradiative synthesis of triazine substituted pyrazoles *i.e.* (4-benzylideneamino-6-methyl-[1,3,5]-triazin-2-yl)-(5-methyl-2-substituted benzoyl/isonicotinoyl/cinnamoyl-pyrazol-3-yl)-amines have been achieved by the cyclocondensation of N-(4-benzylideneamino-6-methyl-[1,3,5]-triazin-2-yl)-3-oxo butyramide with substituted acid hydrazides. Synthesis of required butyramide was done by reacting 2,4-diamino-6-methyl-[1,3,5]-triazine with benzaldehyde and then condensing the product with ethyl acetoacetate. Structural investigation of synthesized compounds has been done by chemical transformation, elemental analysis and IR, ¹H NMR, mass spectral studies. Study of antitubercular and antimicrobial activity of title compounds against some selected Gram-positive and Gram-negative microorganisms was performed to establish the relationship between structure and activity of compound.

Keywords: Microwave synthesis, Triazine, Pyrazole, Antitubercular, Antimicrobial study.

INTRODUCTION

Microwave irradiation technique has so many advantages over the conventional heating in synthesis of organic compounds [1]. High density microwave irradiation technique can be used for parallel high speed synthesis of number of bioactive compounds [2]. The pharmacophore pyrazole has different practical applications in synthetic organic chemistry [3]. Pyrazole fused heterocyclics have been widely used in pesticides and medicines [4]. Literature has been enriched with the progressive findings about the synthesis and activities of pyrazole which covers the domains like antitubercular [5,6], antitumor [7], antimicrobial [8], antipyretic [9], analgesic [10], ulcerogenic [11], antiinflammatory [12] and anticancer [13]. It was observed that positions N-1, C-3, C-4 are much more important for the study of relationship between structure and activity of compound and position C-3 should be linked to different heterocycles for better chemotherapeutic activities [14]. The presence of two bioactive molecules within a single compound increases the antimicrobial activity of that compound. The most common method used for synthesis of pyrazoles is the reaction of 1,3-dicarbonyl, oxo-amide, hydrazine hydrate, ester using suitable catalyst [15]. The double nucleophilic character of hydrazine

for reaction with each carbonyl group of 1,3-diketone requires long period with high temperature [16].

With these observations, we report herein the synthesis of triazine substituted pyrazoles at C-3 position *i.e.* (4-benzylideneamino-6-methyl-[1,3,5]-triazin-2-yl)-(5-methyl-2-substituted benzoyl/isonicotinoyl/cinnamoyl-pyrazol-3-yl)-amines (**5a-f**) by microwave irradiation technique without the use of any catalyst. So as to establish the relationship between structure and activity of compound, all synthesized compounds were studied for their antitubercular and antimicrobial activity against selected microorganisms.

EXPERIMENTAL

All reactions were performed by the microwave irradiation using commercially available microwave oven. Chemicals used were of A.R. grade. Purity of the compounds was checked on silica gel-G plates by TLC and spots were visualized by iodine vapours. Melting points were recorded using Veego, VMP-D digital melting point apparatus and are uncorrected. ¹H NMR spectra were recorded using CDCl₃ and DMSO-*d*₆ as solvents and TMS as internal standard on Bruker Avance-II 400 NMR spectrometer. IR spectra were recorded in the range 4000-400

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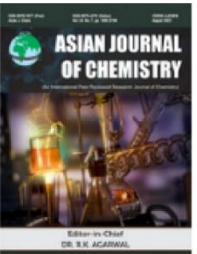
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SURVEY OF PHYTOCHEMICALLY RICHED WILD VEGETABLES USED BY TRIBAL'S OF KATEPURNA SANCTUARY, VIDARBHA REGION.

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ABSTRACT :

Katepurna Wildlife Sanctuary in Vidharbha region of Maharashtra has rich source of vegetation inspite that most part of this region consists of dry deciduous type of vegetation.

This region has large population of tribles mainly Korku, Gonds and Bhills etc. They have developed a highly complex and very specific knowledge of their local vegetation on which they are depended.

The study reveals the use of wild plants as vegetables due to nutritional phytochemical content such as *Abrus precatorius*, *Dioscoria pentaphylla*, *Basella alba*, *Oxalis corniculata*. The various plant part used included whole plant, leaves, stem, root, bark, seed, fruit and any other vegetative part.

Keywords: wild edible plants, tribles, Phytochemicals, Nutrition.

Introduction :

Vidarbha region of Maharashtra has rich biodiversity of plants, inspite of having dry deciduous type of forest. Forest have provided tribal's with enough material from natural wealth for use as traditional food and medicine. The tribal's of Katepurana Sanctuary are Andh, Halba, Pawra, Gond, Korku etc.

The diversity in the wild vegetables not only give variation in diet but also provide nutritional diversity.

Wild vegetables refer to the species which are not cultivated at large scale commercially. They are grown on waste land by tribal communities or collected from their natural habitat, yields etc and used as a source of food income.

Developing countries like India where food industry, malnourishment, poverty is more, potential of Wild vegetable in providing food nutrition, source of income and lively- hood in rural area plays important role.

The survey of plants has been done which was used by tribal as wild vegetable which has enormous medicinal values and phytochemicals which imparts a major role in nutrition. There are some wild vegetables like *Abrus precatorius*, *Basella alba*, *Cassia tora*, *Dioscoria pentaphylla* which are comely used by tribals and phytochemically important.

Sample collection & phytochemical screening *Abrus precatorius* :

Abrus precatorius (Linn) - The plants belongs to family fabaceae commonly known as rosary pea or ratti is medicinally important.

Phytochemical screening of *Abrus precatorius* Linn. seed extract was treated for qualitative estimation for the presence of alkaloids, Carbohydrates, Flavonoids, saponins, phytosterols, tannins according to standard procedure (Rahman *et al.*, 2011). Following phytochemical screening methods were conducted.

Test for Saponins :- Extracts (300mg) was boiled with 5ml water for 2 minutes, the mixture was cooled and mixed vigorously and left for 3 minutes. The formation of froth indicates the presences of saponins.

Test for Tannins :- 1 ml extract was added to 2 ml of sodium chloride (2%), filtered and mixed with 5 ml 1% gelatin solution, precipitation indicates the presence of tannins.

Further test was carried out for carbohydrates, steroids and sterols glycosides, various oils which also shows the presence in the compound.

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**Review of Traditional and Phytochemical Investigations of Essential oil
Yielding Plant Pelargonium Graveolens**

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Abstract:

World population relies on plant based traditional system of medicine for their primary healthcare. A number of herbs belonging to the genus *Pelargonium* for example *P. graveolens* plant is noted for their medicinal benefits in traditional system of medicine. These are very rich sources of various phytochemicals such as phenolic acids, flavones, flavonols derivatives.

These plants derived essential oils which are used in perfumery cosmetics, soaps, creams, aromatherapy products exhibit good antioxidant activity.

Keywords: Aromatherapy, healthcare, essential oil, traditional

Introduction:

Plants have great potential uses especially as traditional medicine and pharmaceutical drugs. Since ancient times plants have been richest source of medicine. A large proportion of world depends on the traditional medicine because of the scarcity and cost of effectiveness of medicine.

Medicinal plants has been used for centuries as remedies for human disease and have great application in the field of agriculture, human and veterinary medicine, food and perfume industry (Butles, 2004).

Indigenous plants have been the traditional source of raw material for the manufacture of medicine (Gupta, 1994). Despite of the advantages of the synthetic, combinatorial chemistry and molecular modeling, medicinal plants remain an important source of new drugs and drug leads.

The focus on plant research has increased all over the world and a large body of evidences has been collected to show the immense potential of medicinal plants used in various traditional systems.

In fact, modern pharmaceuticals still contains at least 25% drug derived from plants (Olaleye et al., 2006). During past several years, there has been growing interest among the usage of various medicinal plants for the treatment of various ailments.

A number of herbs belonging to *Pelargonium* are noted for their medicinal benefits in traditional systems of medicine (Prajapati et al., 2003) and is famous for its essential oil which is one of the 20 th essential oil in the world with the wide application in perfumery, cosmetics and flavor industry (Douglas, 1969). A lot of medicinally important attributes have been assigned to *Pelargonium graveolens* etc.

The common name geranium has been erroneously used to refer to a plant that should correctly be called *Pelargonium*.

Recently China is the main producer of Geranium oil other major producers are India, Egypt, Morocco, Reunion, and the former Soviet Union but extensive industries of local importance in India.



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**Arduino Uno Based Accident Avoiding System IN Mountainous Area
ACROSS U-Turn**

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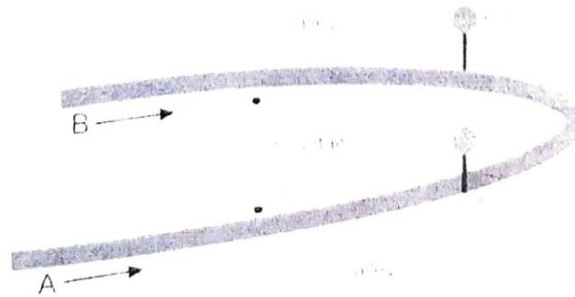
Abstract:

Where there is a U-turn either on a ground level road or in mountainous area, the place becomes prone to accidents, particularly if the speed of vehicles is more, banking of the road is more or non-signalling of horn and light while taking the U-turn on such places.

However, the road accidents on such places can be avoided using "Accident Avoiding System in Mountainous Area Across U-Turn". The suggested system use the typical use of Arduino UNO dev. board along with two ultrasonic sensors, sensor interfacing circuits, lamp driver circuits and two read lamp posts on opposite sides of the U-turn area on such places.

Introduction:

The setup of this system can be understood with the help of following diagram. Here consider one U-turn in a mountainous area. The traffic may be from both sides of the road and there is no disciplined system of traffic like one-way traffic.



Suppose one vehicle (A) is approaching from bottom road towards the U-turn and another vehicle (B) is approaching from top road towards the U-turn simultaneously. There are two R/D lamp posts fixed at the starting points of U-turn, as shown above. Redpost-1 is controlled by sensor-A and the Redpost-2 is controlled by sensor-B.

Whenever the vehicles will pass in-front of the sensors, the sensor system will switch ON the respective Redpost-1 or Redpost-2.

For example, suppose vehicle A is detected by sensor-A, then it will switch ON the Redpost-1, i.e, the lamp post on opposite side of U-turn. This will give a visual alarm to the vehicle-B coming from other side of the mountain.



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SYNTHESIS AND CHARACTERIZATION OF NANOPARTICLES OF 1-HEPTA -O-BENZOYL -β-D-LACTOSYL 5-ARYL 2,4 DITHIOBIURETS

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Abstract:

In view of application of Nanoparticles and lactosyl compounds in industrial and medicinal research, we here by report the synthesized series of 1-Hepta -O-benzoyl -β-D-lactosyl 5-Aryl 2,4 dithiobiurets nanoparticles and are characterized by IR, NMR and X-ray diffractions.

Key words: Dithiobiurets, Nanoparticles and characterization.

Introduction:

Properties of many conventional materials changed when form from nanoparticles. This is typically because nanoparticles have a greater surface area per weight than larger particles which causes them to be more reactive to some other molecule. Carbohydrate especially lactosyl compounds have been uses as starting material in the synthesis of nitrogen and sulphure containing open chain and cyclic compound which was already investigated by earlier workers. Nanoparticles exhibit new physical-chemical properties which are not observed either in individual molecules, or in bulk nanoparticles show unique properties that are significantly different from their bulk materials. In view of this application¹ of lactosyl compounds and Nanoparticles in this we have synthesis to investigate the chemistry of this new compound with reference to their application.

Nanostructure materials are attracting a great deal of attention because of their potential for achieving specific processes and selectivity, especially in biological and pharmaceutical applications^{2,3}. Recent studies have demonstrated that especially formulated nanoparticles have good antibacterial activity^{4,5}.

Experimental:

UV-visible Spectra is measured using UV Spectrophotometer by using model Single Beam UV-Visible Spectrophotometer with software(BI/CL/SP/SB-S-03)of Bio Era make. IR spectra were recorded on Perkin-Elmer spectrum RXI FTIR spectrophotometer (4000-450 cm^{-1}). ^1H NMR was recorded in CDCl_3 on Bruker DRX-300 spectrometer operating at 300 MHz.

a) Synthesis of hepta-O-benzoyl-α-D-lactosyl bromide:

The finally powdered lactose octabenzoate(0.03M, 21.0g) was added gradually to the brominating agent. After the addition the flask was kept for 2hr at room temperature. Then the reaction mixture with chloroform (130ml) then the mixture was shaken vigorously for about 15 min. The resultant mixture was poured into ice cold water. The chloroform layer was then separated. It was washed several with aqueous sodium bicarbonate to remove excess of acetic acid followed by aqueous sodium metabisulphite to remove excess of bromine and finally 2-3 times with water. To the chloroform addition of petroleum ether afforded a solid (16.5 gm). This solid was expected hepta-O-benzoyl-α-D-lactosyl bromide (yield 77%). It was purified by dissolving it in minimum quantity of chloroform and reprecipitating it with petroleum ether, m.p. 168°C.

b) Preparation of lead thiocyanate :

Lead thiocyanate was prepared by mixing aqueous solution of lead nitrate and ammonium thiocyanate. The white granular lead thiocyanate was filtered washed with distilled water and dried at 50°C.

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Microbial Evaluation of Nanoparticles of Some New Lactosyl 5-Aryl 2,4 Dithiobiurets

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Abstract:

Dithiobiurets shows a wide range of application in medical and industrial field. In view of application of this dithiobiurets and Nanoparticles, we hereby report the microbial evaluation of some new lactosyl 5-Aryl 2,4 dithiobiurets.

Key words: Dithiobiurets, Nanoparticles and microbial evaluation.

Introduction:

In view of this application¹ of lactosyl compounds and Nanoparticles in this we have synthesis to investigate the chemistry of this new compound with reference to their application. Properties of many conventional materials changed when form from nanoparticles. This is typically because nanoparticles have a greater surface area per weight than larger particles which causes them to be more reactive to some other molecule. Carbohydrate especially lactosyl compounds have been uses as starting material in the synthesis of nitrogen and sulphure containing open chain and cyclic compound which was already investigated by earlier workers. Nanoparticles exhibit new physical-chemical properties which are not observed either in individual molecules, or in bulk nanoparticles show unique properties that are significantly different from their bulk materials.

Nanostructure materials are attracting a great deal of attention because of their potential for achieving specific processes and selectivity, especially in biological and pharmaceutical applications^{2,3}. Recent studies have demonstrated that especially formulated nanoparticles have good antibacterial activity^{4,5}.

Experimental:

UV-visible Spectra is measured using UV Spectrophotometer by using model Single Beam UV-Visible Spectrophotometer with software (BI/CI/SP/SB-S-03)of Bio Era make.. IR spectra were recorded on Perkin-Elmer spectrum RXI FTIR spectrophotometer (4000-450 cm⁻¹). ¹H NMR was recorded in CDCl₃ on Bruker DRX-300 spectrometer operating at 300 MHz.

Synthesis of hepta-O-benzoyl- α -D-lactosyl bromide:

The finally powdered lactose octabenzoate (0.03M, 21.0g) was added gradually to the brominating agent. After the addition the flask was kept for 2hr at room temperature. Then the reaction mixture with chloroform (130ml) then the mixture was shaken vigorously for about 15 min. The resultant mixture was poured into ice cold water. The chloroform layer was then separated. It was washed several with aqueous sodium bicarbonate to remove excess of acetic acid followed by aqueous sodium metabisulphite to remove excess of bromine and finally 2-3 times with water. To the chloroform addition of petroleum ether afforded a solid (16.5 gm). This solid was expected hepta-O-benzoyl- α -D-lactosyl bromide (yield 77%). It was purified by dissolving it in minimum quantity of chloroform and reprecipitating it with petroleum ether, m.p.1680C.

Preparation of lead thiocyanate : Lead thiocyanate was prepared by mixing aqueous solution of lead nitrate and ammonium thiocyanate. The white granular lead thiocyanate was filtered washed with distilled water and dried at 50⁰ C.



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Microbial Evaluation of Ginger oil Against Dandruff

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Abstract:

Herbal formulation always has attracted considerable attention because of their good activity and comparatively lesser or nil side effects. The objective of present study involves preparation of herbal hair oil using Ginger and Neem and its evaluation for activity against Dandruff.

Introduction:

Dandruff is a common scalp condition that occurs when dead skin is shed producing irritating white flakes and possibly an itchy scalp. Although the dandruff is associated with scalp the flakes may also appear on the face, shoulder, nose, eyebrows etc. Although the market is providing wide range of chemical solution, herbal cosmetics and hair care products are now-a-days widely used by the common people because of lesser side effects with better safety. The formulated hair oil was evaluated, and the various parameters were checked.

Material and Methods**Collection of plant part:**

For the preparation of hair oil fresh Neem leaves and Ginger were collected which are easily available

Base ingredient:

The pure organic coconut oil was selected and used as a base ingredient. Formulation of hair oil. The two herbs used in the formulation were collected and accurately weighed. These two ingredients were added to the hot coconut oil separately in ratio 1: 2 as neem and ginger respectively. Once the two solutions get cooled, were mixed and further tests were done.

Evaluation of the product:

The prepared hair oil was subjected to physical and biological test as follows:

- **Sensitivity test:**
The prepared hair oil was applied to 1 cm of skin of hand and exposed to sunlight for 4-5 min.
- **Color and odor:**
The product appears pale yellow in color with a pleasant smell.
- **Test for pH value:**
The pH value of the solution was measured by pH meter.

Saponification test:

Saponification value of oil is defined as the number of milligrams of KOH required to hydrolyse (saponify) 1 gm of an oil or fat completely. It is an indication of the average molecular weight of the oil or fat and of the length of carbon chain of fatty acid when fat or oil is heated with excess of KOH (alkali) it gets hydrolysed to glycerol and potassium salt of fatty acid.

Procedure:

1. Prepare 0.5 N KOH solutions by dissolving the KOH pellets in 95% of ethanol in stoppered volumetric flask. Keep the solution overnight. Filter it and standardize against 0.1 N oxalic acid solution using phenolphthalein indicator.
2. Weigh accurately 0.5 to 0.7 gm of oil in a 100 ml R.B. flask. Add 50 ml of std 0.5 N alcoholic KOH. Reflux the mixture on water bath till the solution becomes clear. (2-3 hrs.).



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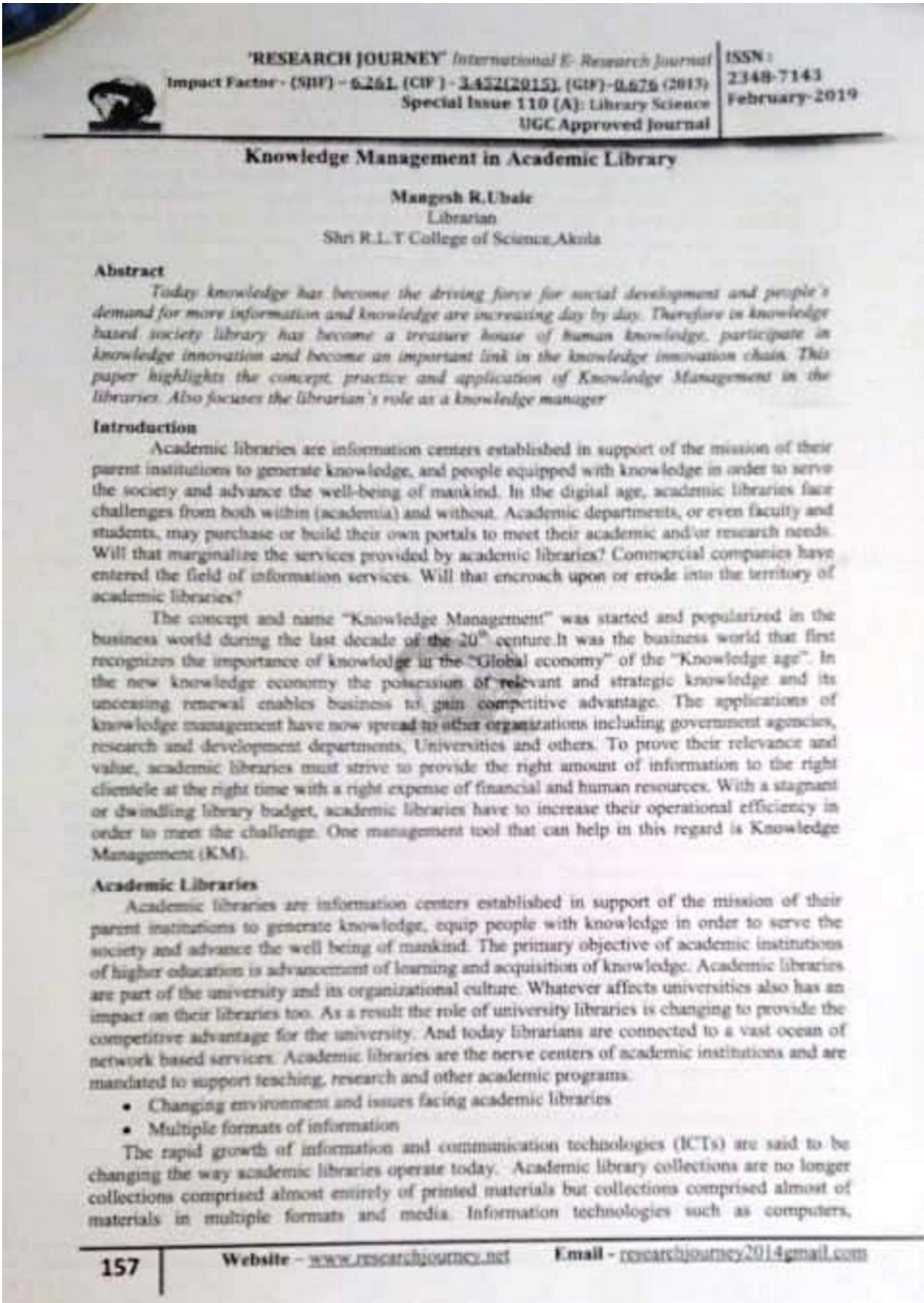
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Knowledge Management in Academic Library

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Abstract
Today knowledge has become the driving force for social development and people's demand for more information and knowledge are increasing day by day. Therefore in knowledge based society library has become a treasure house of human knowledge, participate in knowledge innovation and become an important link in the knowledge innovation chain. This paper highlights the concept, practice and application of Knowledge Management in the libraries. Also focuses the librarian's role as a knowledge manager

Introduction
Academic libraries are information centers established in support of the mission of their parent institutions to generate knowledge, and people equipped with knowledge in order to serve the society and advance the well-being of mankind. In the digital age, academic libraries face challenges from both within (academia) and without. Academic departments, or even faculty and students, may purchase or build their own portals to meet their academic and/or research needs. Will that marginalize the services provided by academic libraries? Commercial companies have entered the field of information services. Will that encroach upon or erode into the territory of academic libraries?

The concept and name "Knowledge Management" was started and popularized in the business world during the last decade of the 20th century. It was the business world that first recognizes the importance of knowledge in the "Global economy" of the "Knowledge age". In the new knowledge economy the possession of relevant and strategic knowledge and its unceasing renewal enables business to gain competitive advantage. The applications of knowledge management have now spread to other organizations including government agencies, research and development departments, Universities and others. To prove their relevance and value, academic libraries must strive to provide the right amount of information to the right clientele at the right time with a right expense of financial and human resources. With a stagnant or dwindling library budget, academic libraries have to increase their operational efficiency in order to meet the challenge. One management tool that can help in this regard is Knowledge Management (KM).

Academic Libraries
Academic libraries are information centers established in support of the mission of their parent institutions to generate knowledge, equip people with knowledge in order to serve the society and advance the well being of mankind. The primary objective of academic institutions of higher education is advancement of learning and acquisition of knowledge. Academic libraries are part of the university and its organizational culture. Whatever affects universities also has an impact on their libraries too. As a result the role of university libraries is changing to provide the competitive advantage for the university. And today librarians are connected to a vast ocean of network based services. Academic libraries are the nerve centers of academic institutions and are mandated to support teaching, research and other academic programs.

- Changing environment and issues facing academic libraries
- Multiple formats of information

The rapid growth of information and communication technologies (ICTs) are said to be changing the way academic libraries operate today. Academic library collections are no longer collections comprised almost entirely of printed materials but collections comprised almost of materials in multiple formats and media. Information technologies such as computers,

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22. Management of E-resources and its Utility

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Abstract


In recent years, electronic resources have become the library's important storage of a university library, and the fund purchased electronic resources also increased quickly, year after year. In order to find out the readers' present conditions, difficulties and requirement of using e-recourses.

The paper focuses on the various aspects of E-Resources. Digital technology has made it more easy, speedy and comfortable to apply the stored intellect. This collected information through the ages has to be used for further research; betterment and overall development of the society. Electronic resources are easily accessible in remote areas. Electronic resources solve storage problems and control the flood of information. Print sources are being digitized. Electronic information sources are becoming more and more important for the academic community. The advent of technology has made the libraries to add new things to its collection. The more prominent among them is the e-resources.



Introduction

An electronic resource is defined as a resource which require computer access or any electronic product that delivers a collection of data, be it text referring to full text bases, electronic journals, image collections, other multimedia products and numerical, graphical or text based, as a commercially available title that has been published with an aim to being marketed. These may be delivered on CD ROM, on tape, via internet and so on. Over the past few years, a numbers of techniques and related standards have been developed which allow documents to be created and distributed in electronic form. Hence to cope with the present situation, librarians are shifting towards new media, namely electronic resources for their collection developments that the documents of users are better fulfilled. The e-resources on magnetic and optical media have a vast impact on the collections of University libraries. These are more useful due to inherent capabilities for manipulation and searching, providing

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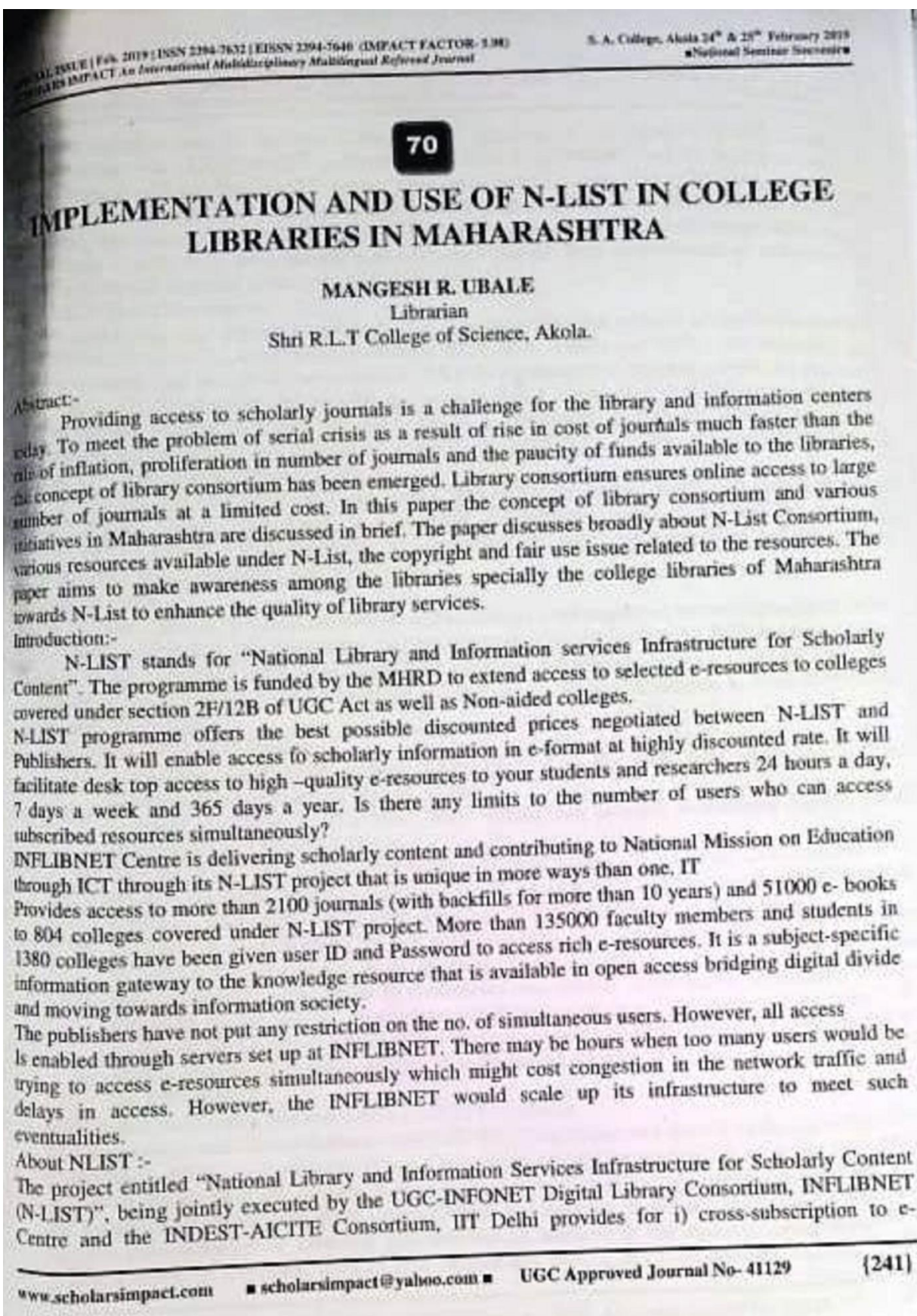
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2. Ethnobotanical Studies on *Moringa Oleifera* (Lam.) Analytical Studies

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India

Abstract


Shevaga (*Moringa oleifera*, Moringaceae) is one such plant, having been prescribed for circulatory and cardiac stimulants contains antiulcer, anti-inflammatory, diuretic, anti oxidant, cholesterol lowering, antidiabetic, antifungal and antibacterial activities. This crude drug powder study was aimed to study the characteristics of powder crude methods in order to assess the quality of herbal drugs for therapeutic value. Sample subjected to various microscopical characteristics, physicochemical parameters and fluorescence test.

Keywords : *Moringa oleifera*, physicochemical parameters, crude drug powder, Microscopy.



Introduction

Moringa oleifera (Family Moringaceae), known in India as Shevaga, is widely distributed in Punjab, Rajasthan and northern part of the India. Herbal medicine has been enjoying renaissance among its practitioners throughout the world. However, one of the impediments in the acceptance of the ayurvedic medicines is the lack of standard quality control profiles. The quality of herbal medicine i.e. the profile of the constituents in the final product has implication in efficacy and safety. Due to the complex nature and inherent variability of the chemical constituents of plant-based drugs, it is difficult to establish quality control parameters. To overcome these problems modern analytical techniques are expected to help in circumventing this problem (Bagul et.al 2005). Between 1999-2001 the ayurvedic pharmacopeia of India was published in three volumes, which gave the botanical identity of plants, composition, analytical procedures etc. In spite the effort made for the standardization of ayurvedic medicine, major problems remain because the formulary lists only 635 whereas the herbal medicines in actual use are believed to be at least 1000 with many regional variations (Annonymus,1987). The absence

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Pharmacognostic and Phytochemical Investigations on *Cleistanthus Collinus*
(Roxb.) Benth. Ex Hook. F.

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Abstract:

The pharmacognostic profile of crude drug has key role in standardization for quality, purity and drug identification. Pharmacognostic studies of *Cleistanthus collinus* (Roxb.) Benth ex Hook f. were carried out in order to establish parameters for its identification and to check adulteration by other species of *Cleistanthus*. Morphological characteristic of the plant was studied by organoleptic evaluation. Powder drug study of the plant parts were also carried out and various structures of the powder drug were observed. This study also includes quantitative leaf microscopy, extractive values and quantitative data. The results of this study could be useful in setting some diagnostic indices for the identification and preparation of a monograph of this plant.

Key words: Crude drug standardization, Phytochemistry, *Cleistanthus collinus*.

Introduction:

As a result of the adverse effects associated with synthetic drugs, people started looking back at the ancient healing systems like Ayurveda, Siddha and Unani. In the present scenario, the demand for herbal product is growing exponentially throughout the world and major pharmaceutical companies are currently conducting extensive research on plant materials for their potential of medicinal value. (Mukharjee, 2002). Herbal drugs play an important role in health care programs especially in developing countries. However, obstacle behind the acceptance of alternative medicines in developed countries is the lack of documentation and stringent quality control. So the documentation and standardization of the raw materials used in herbal medicine is very essential for the worldwide acceptance of this system of medicine (Anonymous, 1989). Correct identification and quality assurance of plant material is indispensable to ensure reproducible quality of herbal medicine, which will contribute to its safety and efficacy (Chopra et al., 1956).

In earlier days, only the external morphological characters were used to identify a drug. As late as the beginning of present century, pharmacognosy had developed mainly on the botanical side being particularly concerned with the description and identification of drug both in their whole state and in powder form. This technique can be established for the correct botanical identification of plant (Kokate et al., 2005).

Cleistanthus collinus (Roxb.) Benth ex Hook f. commonly called as Garavi belongs to family Euphorbiaceae. This plant is having pharmacological potential (Arivoli et al., 2011 and



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2. Impact of Idol Immersion on Water Quality of Pinglakshi Lake of Risod in Washim District

Pravin Kawle

¹Department of Chemistry, Shri R. L. T. College of Science, Akola.

Rahul Gaikwad

Department of Chemistry, VitthalRukhmini College, Sawana.

Abstract :

In this paper the impact of ganesh idol immersion on water quality of lake is discussed. For this study 'Pinglakshi Lake of Risod' was selected as sampling station because large number of ganesh idol are immersed at this point from that area. The work of collecting sample is performed in two steps - i.e. water sample collected a day before idol immersion (water sample I) and a day after idol immersion (water sample II). The changes in physico-chemical properties were observed i.e. changes in pH, DO, BOD, COD, phosphate, nitrate, chloride, total alkalinity, total hardness etc. were recorded by conducting experimental analysis on the basis of changes in parameters it is concluded that level of water pollution increases and causes adverse effect on aquatic life. Idol immersion in natural reservoir with hazardous substances causes threat to the environment. Because it is manmade water pollution, it can be stopped or reduced by awareness among the people and society.


Keywords : Idol immersion, Pinglakshi lake, physico-chemical properties.

Introduction :



Maharashtra had faced several droughts in the past. From which 1972 and 2012 was the worst of them. The 1972 drought was concerned mainly with food and fodder. But 2012 drought was concerned with drinking water, hence called 'man made' drought. At one side there is a big problem of man made drought and other side we pollute the natural reservoir by performing idol immersion [1-2]. In general water pollution occurs due to the pollutants from city sewage and industrial waste discharge into water bodies, which affect aquatic life and human beings.

The pollution due to idol immersion is so harmful because these idols are made of non-biodegradable pop and are painted with toxic dyes.

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17. Effect of Folic Acid Antagonist Methotrexate (MTX) on Changes in Body Weight and Reproductive Organ Weight of *Funambulus Pennanti* (Wroughton)

Dr. Kohchale S. R.

Shri. R. L.T. College of Science, Akola and Janata College Chandrapur.

Dr. Missar S. D.

Shri. R. L.T. College of Science, Akola and Janata College Chandrapur.

Abstract


Methotrexate (MTX), an effective agent in treatment of cancer, is one of the most versatile antineoplastic agents in spite of severe toxicity problems due to cross linking of DNA–inhibition, protein synthesis and arrest of cell–cycle in S–phase are the important factors that interfere with the viability of cell to cell interaction, cell–proliferation and differentiation. The toxic effect of Methotrexate on the reproductive organs (testis and epididymis), accessory glands (seminal vesicle and prostate) and evaluation of testosterone levels have been studied by intramuscularly injecting low dose of 3 mg/kgBW/day and 6 mg/kgBW/day for 15 days to adult male squirrel (*Funambulus pennanti*) during the breeding period January 2007. For comparing the effects the saline treated vehicle was injected same amount of saline and were maintained for the same duration. The low dose treatment resulted into an insignificant and high dose treatment into significant body weight loss. Similarly the reproductive organs and glands showed an insignificant change in weight with low dose whereas significant change with high dose.

Key Words: Methotrexate, Body weight, Organ weight



Introduction

Methotrexate is structurally related to dihydrofolate (the natural substrate for dihydrofolate reductase) that catalyzes the reduction of dihydrofolate to tetrahydrofolate and is a potent inhibitor of dihydrofolate reductase (DHFR). The inhibition of DHFR leads to an accumulation of dihydrofolate which is unable to act as substrate for any of the reaction converting tetrahydrofolate to its cofactor derivatives and, therefore, its accumulation is associated with depletion of the pool of the reduced folate cofactors. Methotrexate (Rheumatrex) is a medicine that is used to treat Rheumatoid arthritis (RA), psoriatic arthritis, Reiter's

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14. Effect of Follic Acid Antagonist Methotrexate (MTX) on Epididymis of *Funambulus Pennanti* (Wroughton)

Dr. Kohchale S. R.

Shri. R. L. T. College of Science, Akola and Janata College Chandrapur.

Dr. Missar S. D.


Shri. R. L. T. College of Science, Akola and Janata College Chandrapur.

Abstract



Effect of Follic acid antagonist Methotrexate on epididymis studied by intramuscularly injecting low dose of 3 mg/kg BW/ per day and 6 mg/kg BW/ day for 15 days to adult male squirrel, (*Funambulus pennanti*) during the breeding period January. For comparing the effects saline treated vehicle was injected same amount of saline and were maintained for the same duration. The histological alterations in the caput and cauda epididymis were remarkable. A significant decrease in size and irregularity in contour was associated with an increase in the intertubular connective tissue, extreme thickness of lamina propria, severe regression of epithelium, pyknosis of nuclei often resulting into granulation, fragmentation, vacuolation and dencondensation of chromatin material, irregularity in their placement, heavy loss of nuclei sometimes enucleating lot of epithelial area, their accumulation in the lumen, extreme vacuolation of supra and infra region, an increase in the thickness of smooth muscle bands around each tubule, sometimes disruption of basement membrane and therefore infiltration of macrophages and leukocytes in between the secretory epithelium, prevalence of cellular debris-like flocculent fibrous epididymal fluid, sperm debris, appearance of clear cells and halo cells in large numbers in the caput segment of the treated groups but more in high dose group for the clearance of these debris, extrusion of degenerating epithelial cells in the lumen and hence vacuolation in between the secretory epithelium, sometimes complete detachment of epithelium from the basement membrane, extreme regression of basal cells, the stereo-cilia appeared either clumped into stiff or limp structure, significant reduction of sperms in both the treatment resulted into oligozoospermia, a few apoptotic germinal elements were also observed in the lumen.

Key Words: Methotrexate, antagonist, caput and cauda

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Synthesis, Structural Study and Biological Evaluation of Pharmacologically Important -1, 3-Substituted Benzothiazolyl Thiocarbamide

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Abstract

Heterocyclic compounds are widely distributed in nature and are essential to life in various ways. Benzothiazole is a heterocyclic compound, weak base, having varied biological activities and still of great scientific interest now a days. They are widely found in bioorganic and medicinal chemistry with application in drug discovery. Benzothiazoles constitute an importance's class of compounds. In recent year heterocyclic compound analogues and derivatives have attracted strong interest due to their useful biological and pharmacological properties. They have also found application in industry as an antioxidant, vulcanization accelerators. Benzothiazole are bicyclic ring system with multiple applications. In the 1950s various benzothiazole such as 2-aryl benzothiazole received much attention due to unique structure and its uses as radioactive amyloid imaging agent and anticancer agent. A number of 2-aminobenzothiazole were intensively studied in medicinal chemistry and reported cytotoxic on cancer cells.

Serial of 1 phenyl- 3(2)hydrazine -1,3 substituted benzothiazolyl thiocarbamide has been synthesized by the interaction of phenyl isothiocyanate and 2-hydrazino-1,3-benzothiazole in acetone medium. The reaction mixture was kept at room temp for 24 hrs. Acetone is evaporated then product is recrystallised by petroleum ether (60-80%). Synthesized compound have been delineated on the basis of chemical transformation, IR, NMR and mass spectral studies. These compounds were screened for their antibacterial and antifungal activities against–Escherichia coli, Proteus vulgaris, Staphylococcus aureus, Salmonella typhimurium, Aspergillus Niger and Candida albicans. These compounds show appreciable activity towards these microorganisms.

Keyword: 2-hydrazino-1, 3- benzothiazole, substituted benzothiazolyl thiocarbamide, Phenyl isothiocyanate, Biological studies.

Introduction:

Benzothiazole is a heterocyclic compound, weak base, having varied biological activities and still of great scientific interest now a days. They are widely found in bioorganic and medicinal chemistry with application in drug discovery. They have also found application in industry as anti-oxidants, vulcanization accelerators. Various benzothiazoles such as 2-aryl benzothiazole received much attention due to unique structure and its uses as radioactive amyloid imaging agents¹, and anticancer agents². Benzothiazoles are bicyclic ring system with multiple applications. A number of 2-aminobenzothiazoles were intensively studied, as in medicinal chemistry^{3,4} and reported cytotoxic on cancer cells⁵. 2-aminobenzothiazoles, substituted benzothiazoles have found applications in several areas of chemistry. 2-aminobenzothiazoles are broadly found in bioorganic and medicinal chemistry with applications in drug discovery and development of the treatment of diabetes⁶, epilepsy⁷⁻⁸, thrombin inhibitors⁹ inflammation¹⁰ amyotrophic lateral sclerosis¹¹, analgesic¹², tuberculosis¹³⁻¹⁴, and viral infection¹⁵. Also 2-(4-aminophenyl) benzothiazoles comprise a novel mechanistic class of antitumor agents¹⁶⁻¹⁷. 2-



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SYNTHESIS, CHARACTERIZATION OF 1- PHENYL- 3(2) - HYDRAZINO -1, 3- SUBSTITUTED BENZOTHIOZOLYL THIOCARBAMIDE.

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Abstract:

Serial of 1- phenyl- 3(2)-hydrazino-1,3-substituted benzothiazolyl thiocarbamide has been synthesized by the interaction of phenyl isothiocyanate with 2-hydrazino-1,3-benzothiazoles in acetone medium. The reaction mixture was kept at room temp for 24 hrs. then acetone is evaporated and product is recrystallised by petroleum ether (60-80%). The title compounds were characterized on the basis of elemental analysis and IR, ¹HNMR and Mass spectral analysis. Hydrazine hydrate comprises a novel mechanistic class of antitumor agent. 2-aminobenzothiazole has received much attention due to their unique structure and interesting biological properties that leads to their use as anticonvulsant antibacterial and muscle relaxant agent. Especially interesting are hydrazine hydrate derivative, which are known to possess remarkable amyloid – imaging, antimicrobial vulcanization accelerators and starting material for various pharmaceutical industries.

Keywords: phenyl isothiocyanate , 2 - hydrazino-1,3-benzothiazoles, substituted benzothiazolyl thiocarbamide

1. Introduction:

Benzothiazole, a multifaceted nucleus, has been under research for the last two decades. Being a heterocyclic compound, benzothiazole finds use in research as a starting material for the synthesis of larger, usually bioactive structures. Its aromaticity makes it relatively stable, although as a heterocycle, it has reactive sites which allow for functionalization.

Hydrazine hydrate comprises a novel mechanistic class of antitumor agent. 2-aminobenzothiazole has received much attention due to their unique structure and interesting biological properties. From the literature survey, it has been found that extensive work has been reported on 2-substituted benzothiazole derivatives in past and evaluated for different activities like antibacterial [1], anticancer [2], antiviral [3], antitumor [4], antifungal [5], anti-inflammatory [6], antioxidative and radioprotective [7], antidiabetic [8,9], anthelmintic [10], anti-leishmanial [11], anticonvulsant [12], neuroprotective [13], a topical carbonic anhydrase inhibitor and an antihypoxic. Taking this into view, and in continuation of our search for biologically potential benzothiazole derivatives, a certain new derivatives were synthesized taking benzothiazole as the basic moiety.

A number of 2-aminobenzothiazole were intensively studied in medicinal chemistry and reported cytotoxic on cancer cells [14]. 2-aminobenzothiazole, substituted benzothiazole have found application in several areas of chemistry. 2-aminobenzothiazole are broadly found in bioorganic and medicinal chemistry with application in drug discovery and development of treatment of diabetes [15], epilepsy [16,17], thrombin inhibitors [18]. Hence, in present work, different benzothiazoles react with hydrazine hydrate and this hydrazino benzothiazoles then focused to fuse with Phenyl isothiocyanate.

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PHYTOCHEMICAL SCREENING OF POLLEN OF *CATHERANTHUSROSEUS* PLANT

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Abstract

The member of Apocynaceae family of *Catheranthusroseus* plant being used in traditional medicine. To study the phytochemical screening of pollen of the plant *Catheranthusroseus* have medicinal properties was carried out. Pollen material was successfully extracted with different organic solvent. The phytochemical screening reveals the presence of alkaloids, steroids, flavinoids, tannins saponins and carbohydrates in them. The result reveals the presence of alkaloids and steroids are reported to have medicinal properties. The presence of these phytochemical can be correlated with the medicinal potential of this plant.

Keywords: Phytochemicals, Pollen, *Catheranthusroseus*.

Introduction

Medicinal plants play a major role in the medicinal needs of about 70% populations in developing countries, which serve as an important resource for the treatment of various maladies and illnesses (Ngari et al., 2010). Globally, about 85% of the traditional medicines used by different ethnic groups inhabiting various terrains for primary healthcare are derived from plants, especially in India; medicinal plants are widely used by all sections of the population with an estimated 7500 species of plants used by several ethnic communities (Farnsworth, 1988). The plant is being used by the local peoples and tribal of Maharashtra as ethno medicine on various ailments. This plant is also being used for its

anti-inflammatory, anti-diarrheal properties by various communities in Indian subcontinent and also across the world. The present study was designed to evaluate the fundamental phytochemical constituents of this wild medicinal plant. It is one of the well-known medicinal plants that have its origin from the continent of Africa. The plant is commonly known as the Madagascar periwinkle or basically *Vincarosea*. It is a tender, perennial plant, which grows as a herb or sub-shrub, growing to approximately 1 metre in height. Leaves simple, petiolate. Flowers are commonly white or pink.

They are known to have various biological activities such as antimicrobial, antifungal, antioxidant, etc. The important bioactive components in plants are usually the secondary metabolites such as alkaloids, flavonoids, tannins and other phenolic compounds (Edeoga et al., 2005). The Medicinal plants have potent phytochemical components which are important source of antibiotic compounds and are responsible for the therapeutic properties (Jeeva et al., 2011; Jeeva and Johnson, 2012; Florence et al., 2012 & 2014; Joselin et al., 2012 & 2013; Sainkhediya and Ray, 2012; Sumathi and Uthayakumari, 2014). As pollen is very important entity carrying paternal genome to next generation, it is quite likely that different important constituents may be present in them. Therefore, preliminary phytochemical screening of pollen grains was carried out in all the plants under investigation.

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Pollen Histochemical Analysis of Gossypium Sp.

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Abstract:

Pollen histochemical analysis are carried out for , possible relation between the pollen content and the mode of pollination , study of pollinator foraging behavior, nutritional demands, pollination mode, pollen content and composition in relation to phylogeny. Lipids and starch are important constituents of the pollen grains to establish the relations with flower foragers. From the histochemical tests it was noted that the pollen grains of all cotton varieties contains starch and lipids. Thus the Pollen grains of all cotton varieties belong to the class of starchy pollen as in all varieties it showed positive test. From the histochemical tests it was noted that the pollen grains of all cotton varieties contains starch and lipids. Pollen histochemistry is possibly related to pollination mode, pollinator foraging behavior and phylogeny. The nutritive value of pollen also influences the behavior of flower visitors.

Keywords: Gossypium, Pollen, Starch, lipid, IKI, Sudan IV

Introduction:

The basic Palynology can also be referred investigations of pollen and spore dispersal, preferably by wind and water and of the pollen and spore content of peat and sediments under formations. Understanding the Palynology of commercially important crop plants like cotton is an important aspect of investigations. The genus Gossypium is known as cotton. Cotton is a valuable crop plant. It is used as a textile fiber because the mature dry hairs twist in such a way that, fine strong thread can be spun from them. Other byproducts, such as cottonseed oil, cake and cotton linter are very useful products. The variety of cotton comes under four cultivated species of Gossypium viz. G.hirsutum, G. barbadense, G. arborium and G. herbaceum. India is only the third largest producer of cotton in the world. In fact, India is the first country in the world to deploy hybrids and at present some 90 varieties of cotton belonging to all four botanical species (Gossypium arboreum L., G. herbaceum L., G. hirsutum L. and G. barbadense L.). Of these, only 25 varieties account for 98 per cent of the total output. The other 65 varieties have poor fiber strength and are of short fiber length. Some of these varieties were once popular, but have now outlived their usefulness. There is a need to de-notify these varieties and develop their substitutes (Choudhary and Laroia, 2001).

Pollen histochemical analysis are carried out for the following reasons i) possible relation between the pollen content and the mode of pollination ii) study of pollinator foraging behavior, nutritional demands, pollination mode, pollen content and iii) composition in relation to phylogeny (Dafni, 1992). Lipids and starch are important constituents of the pollen grains to establish the relations with flower foragers.

Material and Methods

For the histochemical tests fresh and mature pollen grains were collected from freshly dehisced anthers. For the test of starch method proposed by Baker and Baker (1979) was followed. Pollen samples were immersed in to IKI solution and examined under the microscope



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3. Pollen Viability of Selected Varieties of *Gossypium* sp

Anjali A. Sangole

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Abstract

Viability means ability to live; but pollen viability is the ability of pollen to complete post-pollination events and to effect fertilization. As viability refers to the ability of pollen to deliver functional gametes to the embryo sac, the most authentic test to viability would be to assess the fertilization capacity of the pollen as measured by fruit and seed set following controlled pollination. Pollen viability is considered as an important parameter of pollen quality. Environmental factors, particularly temperature and humidity greatly affect the pollen viability. From the observations, the percentage of viability was found to be maximum in H-8 (99.3%) and Ankur -651 (99.0%). It was minimum in Renuka-143; (93.2%) and PA-348; (93.8%). The data obtained during this investigation will be helpful for breeding program of selected cotton varieties.


Key words: *Gossypium* varieties, Pollen Viability, Tetrazolium test

Introduction



Cotton is a tropical and subtropical crop grown on a variety of soil. The predominant types of soil on which the crop is grown are the black cotton soil and red sandy loams to loams found in the state of Gujarat, Maharashtra, Madhya Pradesh, Andhra Pradesh, Karnataka and Tamilnadu. The sowing season of cotton varieties differs considerably in different regions for obtaining maximum yield of cotton. The crop yield is depending on reproductive success of the plant. During the process of reproduction the pollen grains plays very important role. Therefore, the Palynological investigations of cotton varieties in H-8, Ankur -651, Renuka-143 and PA-348 were proposed to undertake for the investigations pollen viability.

Viability means ability. In the old literature the terms pollen viability and pollen sterility were used interchangeably (to live; but pollen viability is the ability of pollen to complete post-pollination events and to effect fertilization (Shivanna and Rangaswamy, 1992). Pollen viability refers to the ability of the pollen to perform its function of delivering male gametes to the

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	A Novel Studies of Synthesis of Nanopartical of 2-S-Tetra-O-Acetyl-B-D-Galactosyl-1-Aryl-5-Tetra-O-Acetyl-B-D-Glucosyl-2-Isothiobiurets and Their XRD Studies	
A. G. Sarap Department of Chemistry, Shri R. L. T. College of Science, Akola-444001 (Maharashtra) India Email: sarap.aashish1@gmail.com		
<p>Abstract:</p> <p><i>The use of microwave irradiation in organic synthesis has become increasingly popular within the pharmaceutical and academic arenas, because it is a new enabling technology for drug discovery and development. By taking advantage of this efficient source of energy. Presently, thermally driven organic transformations take place by either of two ways: conventional heating or microwave- accelerated heating. The chemistry of thiourea of carbohydrate is extensively elaborated and well documented. These compounds arouse interest as potential biologically active substances and versatile intermediates for preparing various derivatives. This reaction is frequently used as a tool for structure determination. They have been found useful in the treatment of hypertension, as appetite suppressant and as a potential anti oxidant cardio protective agent. Chemistry of sugar isothiocyanate with special reference to their utility as intermediate in the synthesis of nitrogen and sulphur containing open chain and cyclic compound. Several glucosyl thiobiurets deravaives has been prepare by condensation of Tetra-O-acetyl-B-D-glucosyl isocyanate with various aryl thiocarbamides by both convensational and microwave method. The identites of newly synthesis compounds have been established on the basis of usual chemical transformation and IR, NMR, Mass spectral studies.</i></p>		
<p>Keywords : 1-tetra-O-acetyl-B-D-glucosyll isocyanate, Aryl thiocarbamides , glucosyl isothiobiurtes.</p>		
<p>Introduction :-</p> <p>The use of microwave irradiation in organic synthesis has become increasingly popular within the pharmaceutical and academic arenas, because it is a new enabling technology for drug discovery and development. By taking advantage of this efficient source of energy, compound libraries for lead generation and optimization can be assembled in a fraction of the time required by classical thermal methods. Presently, thermally driven organic transformations take place by either of two ways: conventional heating or microwave- accelerated heating. In the first way, reactants are slowly activated by a conventional external heat source. Heat is driven into the substance, passing first through the walls of the vessel in order to reach the solvent and reactants. This is a slow and inefficient method for transferring energy into the reacting system. In the second way, microwaves couple directly with the molecules of the entire reaction mixture, leading to a rapid rise in temperature. Since the process is not limited by the thermal conductivity of the vessel, the result is an instantaneous localized superheating of any substance that will respond to either dipole rotation or ionic conduction—the two fundamental mechanisms for transferring energy from microwaves to the substance(s) being heated.</p>		
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Jgd A Emerging Field Iot: A Review

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Abstract:

Internet of Things (IoT) is a new revolution of the Internet. IoT connect different object / devices through sensing system which communicate, share information for enhancement of individual, social and intelligent & smart planet. In this paper mentioned, different applications of IoT as well as technology, challenges and future research areas which will help the researchers of IoT.

Keywords:IoT, RFID Radio-Frequency Identification, Sensors, Actuator, NFC, ZigBee,WSNs

Introduction:

Internet of Things (IoT) is a new revolution of the Internet. IoT connect different object / devices (IoT paradigm enables also called things.)with some sensing system through internet and communicate information about themselves with each other and access information that has been aggregated by other things.

The Internet of Things allows people and things to be connected Anytime, Anyplace, with Anything and Anyone. It provides interaction among physical and digital world.

An IoT system is a network of networks where, typically, a massive number of objects /things /sensors /devices are connected through communications and information infrastructure to provide value-added services via intelligent data processing and management for different applications.

The IoT was started in the year 1998 and the term Internet of Things was first coined by Kevin Ashton in 1999.

IoT connects all the things with technology and makes a whole new separate world for them to interact with each other with the help of internet. IOT is not just a concept but can prove to be a revolution in advancing technology to change the lifestyles of humans altogether [1].

“ A global infrastructure for the information society enabling advanced services by interconnecting (physical and virtual)things based on, existing and evolving, interoperable information and communication technologies”[2]

Technologies:

Technologies of IoT depends on technical innovation following fields:

- Technology used to connect everyday objects and devices to large databases and networks.
- Technology used for data collection with ability to detect changes in the physical status of objects.
- Technology to take action through embedded intelligence in objects.
- To make smaller and smaller things will have the ability to interact and connect.

Following technologies plays important role to make the effective and efficient communications on IoT.



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One Step Galvanostatical Synthesis and Characterization of Acid Doped Pani Thin Films

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Abstract :

In the present investigation , electrochemical behavior of polyaniline (PANI) thin films which is synthesized by chronopotentiometry on platinum substrate as working electrode in three electrode system. During deposition of PANI thin film, various process parameters Viz. time of deposition, concentration of dopant and applied current density were optimized. Surface morphology was characterized by Scanning probe technique Viz. Atomic Force Microscopy (AFM) which confirms the deposition of 50 nm PANI thin films due to the roughness of the topographic surface of the substrate.

Keywords: Polyaniline Thin films, Chronopotentiometry, surface modification. Atomic Force Microscopy,.

Introduction:

Due to the enormous advanced development in the liberalization, Privatization and globalization which can produce adverse effect on flora and fauna. So it is very essential to monitor our environment for our better tomorrow. Therefore scientists were fascinated towards the Conducting polymers i.e. Polyaniline [1 - 2], polypyrrole [3 - 4], polythiophene [5] which can play an important role to nurture the environment due to its ease of synthesis, low power consumption, tunable conductivity [6 - 10]. conducting polymer synthesized by chemical oxidative polymerization techniques [11, 12] which require large amount of times to carry out the reaction with the help of oxidizing agent but it is helpful to synthesize the thick film as well as an interfacial polymerization technique is utilize to produced composite film of polyaniline with the help of oxidizing agent which is quite complex to carry out [13]. PANI films synthesize by electrochemical polymerization techniques [14, 15].

In present work, keeping the idea of one step electrochemical polymerization technique by lower applied current density, PANI thin film synthesize and deposited on platinum working electrode (vs Ag/AgCl reference electrode) and topographical image of PANI thin film is recorded by Atomic Force Microscopy (Park XE 7). The electrochemical characterization performed by utilizing CH 600C electrochemical work station. A three electrode cell containing platinum plates of dimensions 20 * 5 * 0.5 mm³ were used as working & counter electrodes and saturated Ag/AgCl used as reference electrode. In the preparation of electrolyte, aniline monomer distilled once prior to used and stored in cold environment were purchase from Sigma Aldrich. The reagent used as perchloric acid (HClO₄) of laboratory grade. In the electrolyte preparation 1 M of HClO₄ is added drop wise with continuous stirring in 0.5 M of aniline for half an hour. This solution was used for electrochemical deposition of PANI thin films on platinum working electrode at room temperature.



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ELECTROCHEMICALLY SYNTHESIS AND CHARACTERIZATION OF POLYANILINE THIN FILM

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Abstract: In the present investigation, electrochemical behavior of polyaniline (PANI) thin films which is synthesized by galvanostatic technique on platinum substrate as working electrode in three electrode system. Various process parameters Viz. applied current density, concentration of dopant and time of deposition were optimized during the deposition of PANI thin films. The Surface morphology was characterized by Scanning probe technique Viz. Atomic Force Microscopy (AFM) which confirms the deposition of thin films.

Keywords: Polyaniline Thin films, galvanostatic technique, surface modification. Atomic ForceMicroscopy,

1 INTRODUCTION

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to monitor the environment due to its ease of synthesis, low power consumption, tunable conductivity [4 - 8]. conducting polymer synthesized by chemical oxidative polymerization techniques [9, 10] which produce thick film with the help of oxidizing agents and require large amount of time to carry out, as well as an interfacial polymerization technique is utilize to produced composite film of polyaniline with

PRASHANT P. GEDAM^{*1,2}

MAHENDRA D. SHIRSAT^{2,3}

1P a g e

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Microbiological Study of Waste Disposal and It's Efficient Management

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Abstract :

Waste management or waste disposal are all the activities and actions required to manage waste from its inception to its final disposal. Generally waste is of 2 major types i.e biodegradable and non-biodegradable. A biodegradable material can be defined as a material which can be decomposed by bacteria or other natural organisms. A Non-Biodegradable material can be defined as a kind of substance which cannot be broken down by natural organisms. Some of the techniques like landfill, incineration are adopted for waste management but these techniques have certain drawbacks like it can pollute environment. It can cause harmful diseases to the peoples living in that area. The aim of this study is to protect health, well-being and the environment by providing solutions. For the pilot study survey was taken of 100 peoples and data was obtained that peoples are facing problem regarding waste management. Some eco-friendly methods can be used for proper management of waste like biogas plant should be installed. Biogas is produced by bacteria through the bio-degradation of organic material under anaerobic conditions. More awareness regarding classification of garbage should be given to citizens. A nodal government agency should be established that can properly check whether garbage is properly separated or not.

Introduction

Waste management or waste disposal are all the activities and actions required to manage waste from its inception to its final disposal. This includes amongst other things collection, transport, treatment and disposal of waste together with monitoring and regulation. Waste can take any form that is solid, liquid, or gas and each have different methods of disposal and management. Waste management normally deals with all types of waste whether it was created in forms that are industrial, biological, household, and special cases where it may pose a threat to human health.

Types Of Waste

Our planet continues to relentlessly grow in population. A corresponding growth in waste products also occurs. The two major categories of waste are, Biodegradable and Non-biodegradable.

Biodegradable materials can be decomposed by microorganisms

- **Human and animal waste**
- **Plant products, wood, paper, food waste, leaves, grass clippings**
- **Remains from the death of living creatures**

Materials having properties that do not breakdown or decay are called Non-biodegradable.

Examples include

- **Glass**
- **Metals**



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ORIGINAL RESEARCH PAPER

Agricultural Science

BIOCHEMICAL CHANGES IN MIDGUT TISSUE OF SILKWORM *BOMBYX MORI*, DURING GRASSERIE INFECTION.

KEY WORDS: Silkworm, midgut, proteins, carbohydrates, Grasserie.

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ABSTRACT

The silkworm, *Bombyx mori* is a quite delicate venture and might be easily susceptible to, Grasserie which is one of the most serious viral diseases of silkworms. During infection, the understanding of quantitative biochemical responses in the body is very important for discussing many biological stresses and proved to be an appropriate system for studying effects of the disease. For the present study, the silkworms were collected from the local sericulture units in Akola district and quantitative changes in midgut tissues biochemical like, total proteins, Carbohydrates, Cholesterol, free amino acids, Urea, and Uric acid, were estimated in 5th instar of silkworm, *Bombyx mori*, infected with Grasserie, at early (2nd day of 5th instar and late infection 5th day of 5th instar. We reported that, in early and late infection with Grasserie the protein content, total free amino acids, glucose, cholesterol content and urea of mid gut tissue in infected silkworm was lowered, as compared to the control healthy non-infected silkworms of the same age. Uric acid however in early infection stage had non-significant changes, but it is too significantly reduced during late infection. The results recorded were discussed in the light of relevant literature.

INTRODUCTION:

The silkworm, *Bombyx mori* is a purely domesticated insect since, 4,500 years but like other domesticated animals it is a quite delicate venture and might be easily susceptible to a number of diseases, most of which develops seasonally (Govindan and Devaiah, 1998 and Prasad, 1999). Grasserie is one of the most serious diseases of silkworms, though occurs throughout the year, its intensity varied with seasons. It is also known as the 'hanging disease'. Caused by Borrelina Bombycis virus, of the family Baculoviridae causes this disease. The seasonal infection of Grasserie causes patho-physiological changes, at both early and late stages of disease attack. In this infection the virus multiplies and forms polyhedra in the nucleus of infected cells. On incidence of infection the haemolymph as well as the tissues gets affected and shows alterations (Watanabe, 1971). Maratignoni (1964) and Shigematsu and Noguchi (1969) reported that pathogenic infections induce biochemical and physiological alterations in insect and Mahesha *et al.*(2009 : 2013) explain the same in silkworms. Juliana *et al.*, (2013) suggested that, pathogens for Grasserie released virions into the alimentary system and cross the peritrophic membrane. They combine with midgut epithelial cells and enter into the nuclei, starting the first cycle of viral production and replication. These processes cause many biochemical changes in larvae, which respond to these biological phenomena by changing many of its metabolisms to defend themselves against pathogen invasion (Etebari *et al.*, 2007). The investigation of changes in body fluid and tissues is an appropriate system for studying effects of pathogenic disease. The understanding and identifying these biochemical changes will be very important for discussing many biological stresses. Therefore, it is suggested by Gao *et al.*, (2006) that the determination of the biochemical responses in silkworm against pathogenic diseases could facilitate the control of agricultural pests. Hence, we carried out the present study to understand the specific biochemical responses of midgut tissues during attack of Grasserie infection.

MATERIAL AND METHOD:

The diseased larvae are identified and collected from various sericulture units in the district and were continued to rear on mulberry leaves at 25° C. The quantities analysis was made in the midgut tissues of fifth instar larvae, beginning from the newly molted stage (day one) and continued till the 6th day of the instar. The larval period was divided into two chronologically identified states as early experimental stage on day one and late experimental stage on day five of 5th instar. The midgut was dissected and collected from the control non-infected healthy worms and that from the diseased worms. Constituents like, total proteins, Carbohydrates, Cholesterol, free amino acids, Urea, Uric acid, were estimated in non-infected, healthy silkworms and the silkworm infected with Grasserie. Midgut tissue of the all early and late experimental silkworm were then used to prepare tissue

homogenates (20% w/v) in 50 M Tris-HCl buffer (pH 7.0) in a homogenizer. The homogenate was then centrifuged at 10,000 rpm and 4°C for 30 minutes. Supernatant was collected and used for quantification of all the major biomolecules. So was transferred to new tubes and kept at -20°C until the commencement of experiments. An ELICO Clinical chemistry analyzer CI 162 and prescribed assay kits were used for the estimation of all the biochemical constituents.

RESULTS AND DISCUSSION:

Total Proteins: (Table.1)

In insects, the most important place for protein synthesis is midgut that is also the most sensitive tissue to Grasserie causing virus in silkworm. In early infection with Grasserie the protein content of mid gut tissue in infected silkworm was 18.71 % gm, as compare to the control healthy non infected silkworms of the same age, which was observed to be 25.28 % gm. As the infection progresses on 5th day of inoculation a significant decrease of the total proteins was reported as compared to the control healthy non-infected silkworms of the same age. As shown in the table the total mid gut tissue proteins in infected silkworm at 5th day of 5th instar larva was 25.53 % gm, which is significantly lowered as compared to control was 38.56 % gm. In a similar study quantitative and qualitative changes in protein profiles of various tissues of tropical tasar silkworm *Antheraea mylitta D* was studied by Kumar *et al.*, (2011). They reported decreased protein trend in diseased larvae and suggested that it may be due to drastic degradation of structural proteins. But interestingly there was no increase in amino acid content it means that the proteins degraded might be utilized by pathogen for rapid development. In search of causes of reduction in proteins in infected host Goninan *et al.*, (1998) found that it may be as a consequence of infection and also selective utilization of specific protein fraction by infectious pathogen.

Carbohydrate (Glucose):

According to Chino and Gilbert, (1965), Carbohydrates are known to serve as main source of energy to a number of insect species and in the biological system. This biochemical constituent forms a predominant carbon source of chitin, a participant in energy metabolism and the substrate for protein and lipid synthesis in insects. A breakdown of this according to Manohar Reddy (2004) is mainly essential to meet the energy under stress condition. The quantification of glucose carried out on mid gut tissue of 5th instar larvae at early infection with Grasserie showed no remarkable alteration in the level of glucose as 7.01% mg as compared to control 7.09 % mg. However, a drastic reduction in the glucose content 4.73 % mg was recorded in the mid gut tissue of the 5th instar larvae at late infection with Grasserie as compared to the control of the same age was 7.53 % mg. The decrease of glucose at the end of larval instar may be due to the decrement of trehalase



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6. Humidity Sensing Properties of Batio₃ Doped ZnO Thick Flims

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Abstract


In present study, BaTiO₃ doped ZnO nanoparticles was synthesized by a liquid phase method. Structural and compositional characterizations have been studied from X-ray powder diffraction (XRD). Surface morphologies of the samples were analyzed using Field Emission Scanning electron microscopy (FE-SEM) for thick flim of different molecular weight ratio. Further, humidity sensing study of these nanocomposites sensing materials were done. Our result indicates that BaTiO₃ doped ZnO in form of thick film for different molecular weight ratio was most sensitive for humidity in comparison to pristine materials under same conditions. The hysteresis plot between increasing and decreasing the RH range of 30–90% and vice versa. The samples resistance of sample ZB-1 decreases from 10¹¹ Ω to 10⁶ Ω in comparison with the pristine materials. The similar change was also observed in sensitivity.

Key word: Nanoparticle of ZnO and BaTiO₃, Humidity sensor.



1. Introduction

Recently, Humidity sensor has achieve considerable attention driven by its applications in the various filed such as environment monitoring, industrial process control, and our daily life [1-5].As Barium titanate with a perovskite structure is widely used lead-free ceramic material and it has been broadly used for the humidity sensing application in the last century [6-8].Semiconducting oxides based humidity sensors has many advantages when compared to other types of humidity sensors, such as low cost, simple construction, small size etc in operating the environment. The metal oxide such as SnO₂ , ZnO, WO₃, TiO₂, BaTiO₃ etc the change in electrical conductivity depends upon the composition of the gas/humidity surrounding them. Therefore, they are used as popular and useful sensing materials for making inexpensive gas

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Synthesis and Humidity Sensing Investigations of Nanostructured ZnO Doped SnO₂ Thick Films

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Abstract:

In present study, ZnO and SnO₂ nanoparticles was synthesized by a chemical precipitation method. Structural and compositional characterizations have been studied from X-ray powder diffraction (XRD). Surface morphologies of the samples were analyzed using Field Emission Scanning electron microscopy (FE-SEM) for thick film of different molecular weight ratio. Further, humidity sensing investigations of these nanocomposites sensing materials were done. Our result indicates that ZnO doped SnO₂ in form of thick film for different molecular weight ratio was most sensitive for humidity in comparison to pristine materials under same conditions. The hysteresis plot between increasing and decreasing the RH range of 30–90% and vice versa. The samples resistance of sample ZS-3 decreases from 1011 Ω to 105 Ω in comparison with the pristine materials. The similar change was also observed in sensitivity. Activation energy measured from Arrhenius plot of conductivity at different RH and found to be 1.7010-3 eV respectively. The results were re- producible up to ± 77% after 2 months of observations.

Key words: ZnO, SnO₂ nanocomposites, Humidity sensor.

Introduction

Recently, the development in humidity sensor has receives much more attention due to the necessity of controlling and monitoring environment in many varrious fields like industrial and domestic part [1-3]. Semiconducting oxides based humidity sensors has many advantages when compared to other types of humidity sensors, such as low cost, simple construction, small size etc in operating the environment. The metal oxide such as SnO₂ , ZnO, WO₃, TiO₂, BaTiO₃ etc the change in electrical conductivity depends upon the composition of the gas/humidity surrounding them. Therefore, they are used as popular and useful sensing materials for making inexpensive gas sensing devices [4]. The nanocomposites of ZnO and SnO₂ seem to be one of the most promising metal oxide semiconductor for gas/ vapours/ humidity sensing. It has been observed that these nanostructure materials are more perceptive due to their high surface volume ratio, large band gap energy and have more chemically active [5-7]. In present study, nanocomposites of ZnO and SnO₂ thick films were prepared by screen printing method and the humidity sensitive properties of the nanocomposites films were investigated and compared with those of the pure films. The variation of resistance was studied as a function of relative humidity.



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Water Vapour Sensing Mechanism of PANI Doped With ZnO Nanocomposites

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Abstract:

In this PANI is prepared by situ polymerization method and Zinc Oxide (ZnO) nanoparticle prepared by wet chemical method at room temperature. ZnO nanoparticles were combined with PANI via polymerization in acidic aqueous solution to obtain a new type of inorganic – organic composites nanostructured. The samples are prepared in the form of thick film. It is observed that PANI doped ZnO nanocomposites sensor shows a high response and sensitivity with good repeatability as compared to that of pure PANI and ZnO nanoparticle. The effect of hysteresis of the sensors, the effect of pure and composite oxide on sensitivity of the sensors were studied. The crystallinity and the crystallite size were examined by X-Ray Diffraction technique.

Keywords: Polyaniline, ZnO Nanocomposites, Humidity Sensors.

Introduction

The possibility of reliable, reasonably accurate, relatively inexpensive and commercially viable humidity sensors is under investigation using organic-inorganic composites. Humidity sensors are useful for the detection of relative humidity in various environments [1-3]. Humidity, the concentration of water molecules in air, affects various materials used in daily life and industrial processing of drugs, beverages, food, electronic goods etc. High and low humidity affects human beings adversely. Excessive high humidity causes corrosion in metallic components and failure of electronic as well as optical devices [4, 5]. Therefore, humidity is an important parameter to be controlled. Recently, there have been increased demands for humidity sensing elements for use in automatic humidity control systems. Polymer, polymer composites and modified polymers with hydrophilic properties [6] show excellent humidity sensing properties. Conductivity of polyaniline can be varied over a broad range and hence, it can find wide use in making sensors [7-12]. Capacitive humidity sensors utilize conductive plates formed on a dielectric film. This forms a capacitor that is sensitive to the amount of water vapours in the air. The active portion of the sensor changes its dielectric constant as it absorbs atmospheric humidity, which varies the sensor's capacitance in proportion to variation in relative humidity. Another mode of humidity sensors is resistive sensors which uses a moisture-sensitive material between two metal plates or on an interdigitated electrode substrate [13, 14]. The device's resistance varies with variations in relative humidity. The main advantage of resistive technology



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Study of AC Electrical Conductivity and Dielectric Properties of Polypyrrole Based zno Nanocomposites

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Abstract:

Polypyrrole based Zinc Oxide (PPy-ZnO) nanocomposites are synthesized by in-situ polymerization in different weight percentages using oxidation method. The surface Morphology and structural properties of prepared sample was studied by using X-ray diffraction and field emission scanning electron micrograph (FE-SEM). The AC electrical conductivity and Dielectric properties of Polymer based nanocomposite of various composites materials were investigated at different temperatures and frequencies from 100Hz to 1MHz. In this the dielectric constant decreased with increase in frequency and temperature. As ZnO concentration increases the AC conductivity increased with frequency. The Activation energy of PZ2 (70%ppy+30%ZnO) was maximum among the samples and it is found to be 0.1106 eV.

Keywords: Polypyrrole, ZnO; Dielectric constant, AC conductivity.

Introduction:

Recently, the conductive polymer like polypyrrole, polythiophene, polyaniline, etc.[1]. received a great deal of attention because of its good environmental stability, facile synthesis and significant electrical conducting characteristics [2]. To improve the characteristics of polymer for commercial application, ZnO nanoparticles have also attracted considerable attention in the polymer community as fillers for polymer composites because of wide band gap energy of 3.37 eV and large excitation binding energy of 60 meV at room temperature [3-6]. ZnO nanoparticles into polymers can improve the optical and electrical properties of polymers due to a strong interfacial relations between the organic polymer and the inorganic nanoparticles [7]. In present work, pure PPy and ZnO doped PPy nanocomposites were synthesized by Sit tu polymerization method in a batch process and then characterized by XRD and SEM. The A C conductivities and dielectric properties of polypyrrole and its nanocomposites were measured by using two probe method.

Experimental

Zinc oxide (ZnO):

In preparation ZnO, 0.2M Zinc Acetate dehydrates dissolved in 100 ml de-ionized water was ground for 15 min and then mixed with 0.02 M solution of NaOH with the help of glass rod. After the mixing the solution was kept under constant magnetic stirring for 15 min. and then again it was grinded for 30 min. The white precipitate product was formed at the bottom. The obtained product was washed many times with the deionized water and methanol. The final product was then filtered and precipitate is obtained in the form of white paste. The paste was kept in a vacuum oven at 80°C for 4 hrs. So the moisture will be removed from the final product



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Synthesis of thiazol, thiazinan, thiadiazin, thiazolidin, triazine, thioxo-pyrimidin and thioxo-imidazolidine by inter-intra molecular cyclization

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Syntheses of five and six membered heterocyclic derivatives by the reaction of disubstituted thiocarbamides with inter-intramolecular cyclizations in catalyst free condition have been reported. The simple product isolation without column, good yields under mild condition, and applicable green matrix are the advantages of present protocol.

Keywords: Thiocarbamides, thiazol, thiazinan, thiadiazin, thiazolidin, triazine, thioxo-pyrimidin, thioxo-imidazolidine

Thiazols, triazines, imidazolidines, thiadiazines, thiazolidines and thiones are key structural motif and attracted considerable attention because of their applications in pharmaceutical and biological systems. Many of the scaffolds interestingly exhibits anti-proliferative¹, anti-asthmatic²⁻⁴, anti-inflammatory^{5,6}, anti-tubercular⁷, anti-depressant⁸⁻¹¹, anti-cancer^{12,13}, anti-viral¹⁴, anti-ulcers¹⁵, anti-hypertensives¹⁶, anti-histaminics¹⁷, anti-diabetic, anti-protozoal^{18,19}, neuroprotective, anti-oxidant²⁰, and molluscicidal²¹⁻²⁷ activities. Furthermore, literature explorations revealed that, much work have been reported on inter molecular cyclization reaction of thiourea with phenacyl bromide²⁸⁻³¹, chloroacetic acid³²⁻³⁵, chloroacetyl chloride³⁶, and α,β -unsaturated acid³⁷ in various reaction condition. Synthesis of aza-heterocycles from N,N'-disubstituted thioureas³⁸ and 2-phenyl-amino-thiazolines from (2-hydroxyethyl)-phenylthioureas³⁹ have been reported by intra molecular cyclization using TsCl/NaOH.

The development of useful organic transformations from simple starting materials with few synthetic steps to unite compounds to form highly functionalized and diversified molecules while keeping environmental aspects with interesting properties is highly desirable and have great synthetic challenge for chemists⁴⁰⁻⁴². Although various methods for the syntheses of heterocyclic compounds have been reported many of them exhibit one or other limitations such as use of more quantity of organic solvents, catalysts, formation of hazardous waste

product, and carbon emission during chemical reaction that have serious environmental threats^{43,44}.

To reduce the environmental damage by developing the synthetic plan includes minimum quantity of environment benign solvents and or dilute acid solution with catalyst free conditions. Therefore, the development of environmentally benign, catalyst free condition and green chemistry matrix remains a main objective for the synthesis of heterocyclic derivatives^{45,46}. To best of our knowledge, we wish to report the environmental benign synthesis of heterocyclic compounds which affords good yields under mild and catalyst free condition (Scheme I and Scheme II).

Results and Discussion

We have found that, synthesis of heterocyclic derivatives by monitoring reaction under mild conditions can be achieved. Regarding the optimization of reaction conditions, we have applied basic concept to reduce more quantity of organic solvents, hazardous catalyst, longer reaction time and to enhance yield with green chemistry matrix.

We examined reaction of **6a** by the interaction of diphenyl thiourea with phenacyl bromide under stirring, refluxing and or microwave irradiation methods. In initial experiment, we have studied the reaction in aqueous medium due to environmental impact for organic synthesis but water did not give any desirable impact (Table I, Entry 1). We have



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PHYTOCHEMICAL AND ANTIBACTERIAL PROPERTIES OF ETHANOL EXTRACT OF *SYZYGIUM CUMINI* SEED ON PATHOGENIC BACTERIA

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ABSTRACT

Phytochemical investigation was carried out on the crude ethanol and aqueous extracts of *Syzygium cumini*. The antimicrobial activity of seed extract was tested against standard strains and clinical isolates of five bacteria using the agar well diffusion method. In Preliminary phytochemical analysis the presence of flavonoids, alkaloids, glycosides, steroids, phenols, saponins, terpenoid, cardiac glycosides and tannins were present in the extracts. The extracts showed inhibitory activity against pathogenic, gram negative bacteria viz, *Pseudomonas aeruginosa* and *Escherichia coli*, *Proteus vulgaris* and gram positive bacteria were *Bacillus subtilis*, and *Staphylococcus aureus*. The results showed that the ethanol extracts was more potent than the aqueous extracts.

The pharmacognosy implies a particular knowledge of methods of identification and evaluation of drugs. *Syzygium cumini* synonyms such as *Syzygium cumini* (L.) Druce, *Eugenia jambolana* Lam., *Syzygium jambolanum* DC, belongs to family Myrtaceae, is a large evergreen tree up to 30 m in height and a girth of 3.6 m with a bole upto 15 m found throughout India upto an altitude of 1,800 m (Chitnis *et al.*, 2012). It has been valued in Ayurveda and Unani system of medication for possessing variety of therapeutic properties.

The medicinal properties of several herbal plants have been documented in ancient Indian literature and preparations have been found to effective in treatment of disease. Therefore to meet the increasing demand of manufacturing modern medicine and export, the need of medicinal plants have enormously increases. This demand is generally met with by cultivating uprooted medicinal plants (Ahmed *et al.*, 1998).

Staphylococcus infection can spread through contact with pus from infected wound, skin to skin contact with an infected person by producing hyaluronidase that destroyed tissue. *Proteus vulgaris* can be deadly when in sinus respiratory system, if left untreated or it is treated with antibiotic that have only intermediate effect *Proteus vulgaris* (Paratrack *et al.*, 1998). *Escherichia* genus which are found worldwide in warm band cold blooded animals, in humans, and in non living habitats. They cause illness in humans and many animals. *Pseudomonas aeruginosa* causes the urinary tract infections in human and animals, if remain untreated

causes several complications related to UTI. Whereas *Bacillus subtilis* can contaminate the food however, they seldom results in food poisoning (Ryan and Ray, 2004).

During the last ten years pace of development of new antimicrobial drug has slows and the prevalence of resistance has increased surprisingly (Akinpelu and Onakoya, 2006). The problem of microbial resistance is increasing tremendously and antimicrobial drug becomes inactive against such resistant strain therefore action must be taken to reduce this problem, such as controlling the use of antibiotic and carrying out research of better understanding of genetic mechanism of resistance.

Researchers are increasingly turning their attention to herbal products such as *Syzygium cumini*, looking for new leads to develop better drugs against MDR microbe strains (Mohammed Imran *et al.*, 2017). In the present study; we have selected Indian medicinal plant *Syzygium cumini* to be screened against pathogenic bacteria. The selection of medicinal plants is based on its traditional uses in India. (Mehmoud *et al.*, 2001). The objective of this study was to determine the antibacterial effect of seed extracts from the *Syzygium cumini* seeds against pathogenic bacteria, *Escherichia coli*, *Staphylococcus aureus*, *Proteus vulgaris*, *Pseudomonas aeruginosa*, *Bacillus subtilis*.

MATERIAL AND METHODS

The experiment was conducted in Microbiology Laboratory, Department of Microbiology, Shri Radhakisan Laxminarayan Toshniwal College of

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A Study and Screening of Sickle Cell Disease Patient of Sub District Hospital Daryapur, India

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Abstract: Sickle cell disease (SCD) is a very dangerous disease. In our study we collect 483 patients blood sample form different age group and all cast belong patients of sub district hospital Daryapur. First upon we perform solubility test, those blood sample show positive solubility test further used in electrophoresis test. In our investigation out of 483 bloods sample 77 blood sample show positive test of solubility test. And out of which 77 sample only 3 sample show sickle cell dieses and 29 show carrier patients in Daryapur tahshil during two months.

Keywords: Sickle cell disease, Electrophoresis. Solubility test.

I. INTRODUCTION

Hemoglobinopathies are the most common monogenic disorders in India posing a significant health burden. Sickle cell anemia is a haemoglobinopathy due to a single point mutation in the B-chain of human hemoglobin. The amino acid valine replaces glutamic acid in the sixth position of the B-globulin chain [1]. An important clinical issue requiring further clarification is the effect of this abnormal hemoglobin on the physical growth and development of children with sickle cell disease. The disease damages and changes the shape of red blood cells (RBCs). The change in shape is a response to cell deoxygenation. When the oxygen uptake of the cell is low, cells change their shape from a healthy round disk to a crescent, holly leaf or other similarly distorted shape. This shape distortion is referred to as sickling. Initial studies on sickle cell disease patients from western Odisha demonstrated a mild clinical course with higher hemoglobin levels, lower reticulocyte counts, persistence of splenomegaly, infrequent leg ulcers and priapism compared to patients with the disease of African origin [2]. Subsequently, in western and central India it was found that the disease was milder among tribal populations in Valsad in south Gujarat compared to non-tribal populations in Nagpur in Maharashtra. Apart from higher HbF levels, a significant ameliorating factor was the presence of associated α -thalassemia, which was very common in tribal populations in Gujarat [3]. Since then, reports of more severe features, particularly from central India have raised the question of geographic variations in the manifestations of SCD within India. In a retrospective study, where 316 children with sickle cell anemia were followed up for a period of 5.8 – 5.7 years in Nagpur, there were 1725 hospitalizations among 282 patients and 96 children had severe disease with severe vaso occlusive crises, severe anemia, splenic sequestration, stroke and hypersplenism being reported and 10 babies died during this period [4].


In this study, first upon collect the blood sample form doubted patient and then check its sickle cell disease by using solubility and confirmatory test.

II. MATERIALS AND METHODS

In this study collection of blood sample from to the all cast people who show symptom like sickle cell patients group from Daryapur tahshil of Maharashtra. The age group of patients is 0-60 yr.

A. Collection Of Blood Sample

- 1) **Venipuncture:** Venipuncture is the most common way to collect blood from adult patients. Collection takes place from a superficial vein in the upper limb, generally the median cubital vein; this vein is close to the skin and doesn't have many large nerves positioned close by. This reduces pain and discomfort for the patient.
- 2) **Fingerstick:** Fingerprick sampling involves taking a very small amount of blood from the patient, usually from the end of a finger. It is over quickly and requires very little in the way of preparation; therefore, reducing concern and anxiety in patients, particularly in children and nervous adults. Patient welfare at the point of collection is not the only reason why this method should be considered the best way to collect a blood sample. The long-term benefits to the patient include the loss of less blood and the ability to carry out testing at home, as a phlebotomist is not required for the procedure.



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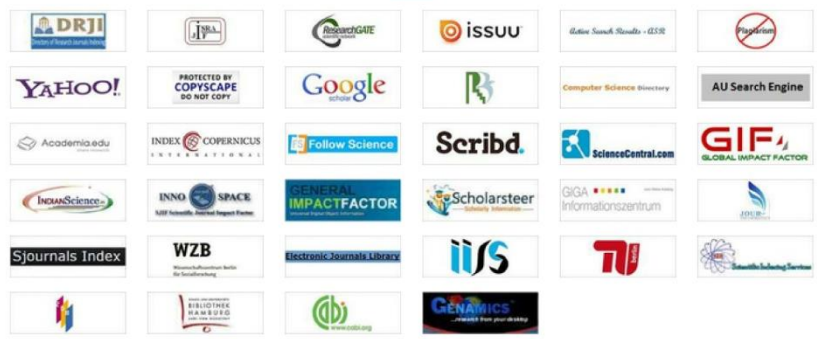
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Let's do it for Kerala

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Akola

Let's do it for Kerala

Let's rebuild Kerala

Let it firmly stand

our god's own land

Flood devoured all their life

someone lost his brother, while other lost his wife

Come forward & support them to stand

Why you hesitate to lend a helping-hand ?

Fishermen came though boats quite narrow

Saving many lives proved himself a hero

Severely suffered Kochin, Idukki, Malapuram,

Not less did Trissure Kottayam & Earnakulum

It may take years for things to regain

At least for now we can relieve their pain

So let us all come together

For our malyali sister & dear brother

Everything is lost both property & money

some familiars suffered, while unknown many

But who saw the mother's sorrow

who lost her son, the only hope for tomorrow

For covering only Kerala flood, we thank our media

After all Kerala too is a part of India.

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God's own country

*Own your own country
Where are you God of mine ?
What are you doing ?
While life in Kerala is dying
No one is actually safe
Flood is devouring entire humanity
Why do look like spectator ?
During this moment of sudden calamity
Everyone is crying & shouting for help
Fishermen are saving the lives of men & women
Everything from house flooded away far
Leaving behind only tearful eyes & pain
Many have died & many are dying
Others are running helter & sketter
Losing all hopes running for safety
Homeless searching out for food & shelter
A child was drowning crying out for life
Deeper, deeper in waters he went
With tears & water in his eyes, died
Listening to the mother's cry, people stood silent
Come God ! Come !
Save your own country
Before it turns out
To be a fearful cemetery
- Arun B. Khedkar*

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One Day

*One day you will fall
From your great height to small
Thy body will meet the dust
So in Almighty alone you trust
The sand of life is running out
So you be kind to all throughout
Hardly will you enjoy this life
In these quick moments of endless strife
The sunshine will brighten your last glory
Before night covers you with the dark fury
Life is this ? Colourful, carnival ?
or only stepping towards fearful funeral ?
For short time of life you will have a ball
Only to obey the ultimate call*

- Arun B. Khedkar

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Antimicrobial Activity of Chalcone Derivatives and Their Synthesis

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Abstract:

At the past many researches had done on Chalcone derivatives as anticancer and antimicrobial agents. Our prediction is that Chalcone derivatives having reacting α,β -unsaturated keto group is responsible for this biological activity. The derivatives of Chalcones were prepared using Claisen-Schmidt condensation scheme with appropriate Acetophenone and Benzaldehyde derivatives in presence of base and ethanol at room temperature. The antimicrobial activity of the compound was found to be good. 3-Hydroxyacetophenone derivatives shows better antimicrobial activity against both the microbes. The characterizations of the compound have been confirmed by IR spectroscopy, H^1 NMR spectroscopy, TLC method and Melting point.

Keywords: Chalcone derivatives, Claisen-Schmidt condensation, Antimicrobial activity

Introduction:

The world Age Standardize (AS) mortality rate shown that there are 126 cancer deaths for every 1000,000 man in the world. Cancer mortality is higher among man than woman (207.9 per 100,000 man and 145.4 per 100,000 woman). Chalcones are one of the most important classes of flavonoids. Chalcones (trans-1,3-diaryl-2-propen-1-ones) are α,β -unsaturated ketones consisting of two aromatic rings (ring A and B) having diverse array of substituents. Chalcones have been used as intermediate for the preparations of compounds having therapeutic value. Chalcones have been identified as interesting compounds that are associated with several biological activities. The most common chalcones found in foods are phloretin and its glucosidephloridzin (phloretin 2'-O- β -glucopyranoside), and chalconaringenin. These are naturally occurring compounds exhibiting broad spectrum biological activity including anticancer through multiple mechanism. Lots of derivatives can be synthesised and were biologically screened for antifungal activity. It also possesses wide range of pharmacological activity such as antibacterial, antituberculosis, antigout, anti-inflammatory, antiplasmodic, etc. The presence of reacting α,β unsaturated keto group in chalcones is found to be responsible for their biological activity. The derivatives of chalcone were prepared using Claisen-Schmidt condensation scheme with appropriate acetophenone and aldehyde derivatives. Chalcone bears a very good synthon so that variety of novel heterocycles with good pharmaceutical profile can be designed.

Experimental:

Determining the melting point of a compound is one way to test if the substance is pure. So, melting point of the compound has been taken in an oil bath using thermometer. All antimicrobial activities measured in millimetre as unit. IR spectral data were recorded on FTIR-RX1 spectrophotometer. H^1 NMR data were measured using $CDCl_3$ solvent on 300 MHz



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VISIBLE QUANTUM CUTTING & DOWN-CONVERSION
IN $\text{CaF}_2: \text{Gd}^{3+}, \text{Eu}^{3+}$ PHOSPHOR

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ABSTRACT :

The conversion of vacuum ultraviolet (UV) radiation to visible (VIS) light is described which makes it possible to obtain two VIS photons for each vacuum ultraviolet (VUV) photon absorbed. Often it is termed as Quantum Cutting (QC). The phenomenon also called as down conversion (DC), is demonstrated by $\text{CaF}_2: \text{Gd}^{3+}, \text{Eu}^{3+}$. We prepared $\text{CaF}_2: \text{Gd}^{3+}, \text{Eu}^{3+}$ phosphor synthesis via reactive atmosphere process. Powder X-ray diffraction analysis shows structural purity of as-synthesized phosphor. The emission and excitation spectra of $\text{CaF}_2: \text{Gd}^{3+}, \text{Eu}^{3+}$ were investigated using the VUV beam line of the Beijing Synchrotron Radiation Facility (BSRF), China. The energy transfer (ET) in calcium fluoride compound from the Gd^{3+} ions to Eu^{3+} through cross relaxation occurs. On the basis of the calculations from the emission spectra in the visible region obtained, we have obtained optimal quantum efficiency as high as 117% for red-emitting $\text{CaF}_2: \text{Gd}^{3+}, \text{Eu}^{3+}$ phosphor under excitation of 203 nm in reactive atmosphere process (RAP).

KEYWORDS: Reactive Atmosphere Process (RAP), Quantum cutting, VUV spectroscopy, Energy transfer, CaF_2 .

1. INTRODUCTION

For the development of mercury free florescent lamps and plasma display panels (PDPs), we require phosphor having quantum efficiency is greater than unity under VUV excitation. The phosphors having quantum efficiency is greater than unity are called quantum cutting phosphors. Quantum cutting provides a means to obtain two or more low energy photons for each high energy absorbed photon. Therefore it serves as a down converting (DC) mechanism with quantum efficiency greater than unity and it offers the prospect of providing enhanced energy effectiveness in lighting devices [1]. In order to obtain quantum-cutting phosphors with quantum efficiencies exceeding unity, the lanthanide ions are obvious candidates for this purpose due to their energy level structures that afford metastable levels from which quantum-splitting processes are capable. The inorganic calcium fluoride is one of the most important host with certain weird characteristics like wide band gap greater than 11 eV. Calcium fluoride with rare earth doped phosphor has conventional attention for numerous research works [3]. B. Herdenet *et al.* reported photon cascade emission in Pr^{3+} -doped fluorides with CaF_2 structure [4]. W. Binder *et al.* reported $\text{CaF}_2: \text{Sm}^{3+}$ Phosphor was used for the application of solid state laser materials [5]. A. Lucas discussed $\text{CaF}_2: \text{Dy}$ and $\text{CaF}_2: \text{Tm}$ phosphors are used for the application of dosimetry [6]. In our experiments we use gadolinium and europium lanthanides as a dopant in the host of CaF_2 for the application of quantum cutting. The process energy transfer and quantum cutting in $\text{CaF}_2: \text{Gd}^{3+}, \text{Eu}^{3+}$ can occur by the dopant combination of Gd^{3+} and Eu^{3+} , in which Gd^{3+} (acts as a sensitizer) and absorbing high energy VUV photon is cut into two visible photons emitted by two Eu^{3+} ions (acts as an activator).

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Isolation of Microbes Associated with Biofilm Formation on Removable Partial Denture (RPD) and Oral Hygiene Regimen for RPD Patients

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ABSTRACT

Biofilm microorganisms are associated with intermittent persistent oral infections and are substantially resistant to antimicrobial agent. It has been noted that more than 600 different types of bacteria are present in oral cavity which causes biofilm formation. Some are *S. mutans*, *P. aeruginosa*, *S. aureus*, *E. coli*, *B. subtilis*. These bacteria encounter foremost troubles such as dental caries and loss of teeth. Biofilm formed swab sample was collected of 30 patients by using swabbing technique and bacteriological examination was carried out. The isolates were recognized by standard microbiological procedure. By TM and CRA method, Biofilm detection was carried out. By Kirby-Bauer disc diffusion technique, antibiotic susceptibility was performed. TM method shows biofilm formation inside the tube and on CRA medium black colored colonies were observed by biofilm producing organism. We can conclude that *S. mutans*, *P. aeruginosa* is highly, *S. aureus* is moderately and *E. coli* is weakly responsible for biofilm formation while *B. subtilis* is non – biofilm producer. These organisms show susceptibility to various antibiotics.

KEY WORDS: Oral Flora, Biofilm, Antibiotic Susceptibility Test

INTRODUCTION

The Microbial multiplicity in buccal cavity is among the biggest surface as characterized in human body. By precise attention is the dental biofilm, which forms initial selective adsorption of bacteria from saliva onto tooth surface. The aggregate of microorganisms reside on the surface and in deep layers of skin, saliva, oral mucosa as well as in conjunctiva and in gastrointestinal tracts. The microflora existing in oral cavity is called oral micro flora. One of the commonly encountered problems in dentistry is loss of teeth and consequential replacement. Along with the restoration of function and aesthetic, removable prosthesis may change the oral ecology either qualitatively or quantitatively, such as increasing the

total amount of oral microorganisms, (Azizah AL Mobereek, 2003 Heller et al, 2015).

Oral microbiology is the study of microorganism of the oral cavity and their interaction between oral microorganisms or with the host (Stewart et al, 2001). The environment present in mouth allows the organism to grow there. The health of our mouth mirrors the condition of our whole body. For example, if our mouth is healthy, chances of our overall health is good too. On the other hand destitute oral health may lead to many oral problems such as formation of biofilm, dental caries, oral and facial pain, problems with the heart and other major organs, digestion problems and periodontal diseases. Oral cavity is a great habitat with a stable induction and removal of microbes with nutrients. These opportunistic human pathogens colonize at several anatomically distinct surface of human body, mainly in warm and moist areas such as oral cavity. As these are opportunistic pathogens they cause various dental problems such as formation of biofilm, dental plaque, dental caries and periodontal diseases (Marsh 2006). Periodontitis is frequent health difficulty caused by pathogenic biofilm forming bacteria that accelerates inflammation resulting in either reversible gingivitis or severe periodontal damage, leading to loss of healthy tooth, (Gutt et al, 2018).

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Biofilm have been concerned as the main source of etiopathogenesis of dental caries and associated diseases. However biofilm can



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Editors Communique

Have we tamed the coronavirus? May be yes,
as pandemics do not die, they can only be faded !

Science and technology has made it possible, in the shortest span of time, it has shown that with firm determination and international cooperation, we can win over the onslaughts of even the worst of the pandemics. COVID-19 is perhaps fading over now, due to our coordinated efforts worldwide. Though we have lost millions, in the two year period, partly due to the mishandling of the viral attacks and somewhat by our own follies and carelessness. Anyway lessons learnt from the past, always make us more stronger and determined. Let us now not relax and work on a better mode, as all is still not well yet. The almost taming of the virus and its cousins have indicated some of the concealed failures, on which we have to focus now. We have to be more vigilant, and even a bit of laxity can spoil the good work done. On societal and governmental parts, utmost care and caution is required on a long term basis.

On behalf of *Bioscience Biotechnology Research Communications*, we falter at words to express our deep sense of solitude and grief on the catastrophic events of the world wide pandemic, spanning over two years now. We pray for the strength to bear this universal calamity and come up with long lasting fortitude to eradicate it soon.

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Quality publication is one of the ways to keep science alive, and good journals have a leading role to play in shaping science for humanity! As teachers, we have great responsibilities, we have to advocate our students to accomplish and show them the path to test their mettle in hard times to excel, especially in the post COVID 19 era. Science and its advocates will rise more to the occasion and will soon provide succor to the already grief stricken humanity.

Sharique A. Ali, PhD

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**Isolation, Partial Characterization And Extraction Of Alkaline
Protease From Bacterial Isolates Of Lonar Lake**

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Introduction:

Lonar crater, is unique ecosystem situated in the Buldhana District of the Maharashtra State, India (Latitude 19°58', Longitude 76°36'). Lonar lake is a national geo-heritage, saline soda lake in basaltic rock with pH 9.5 to 10.5 (Frederickson et al., 1973). Extracellular enzymes like amylase, lipase, protease and cellulose are produced by *Bacillus cereus*, *Bacillus firmus*, *Enterococcus caseliflavus*, *Bacillus fusiformis*, *Bacillus cohnii*, *Bacillus horikoshi* isolated from water and sediment of alkaline Lonar Lake (Joshi et al., 2007).

Alkaline proteases are those which have the pH optima in the range of 8 to 11 and mainly belong to bacterial origin. Alkaline protease producers comprise many alkaliphilic, neutralophilic and alkalitolerant microbes. *Aeromonas hydrophilia*, *Bacillus licheniformis*, *Bacillus megaterium*, *Bacillus clausii* and *Bacillus subtilis* are industrially important bacterial alkaline protease producers (Sandhya et al., 2005). Starch degrading amylase enzymes are most important in the biotechnology industries with huge application in food, fermentation, textile and paper. Many microorganisms are able to produce amylases including *Bacillus sp.*, *Lactobacillus*, *Escherichia*, *Proteus*, *Streptomyces sp.*, *Pseudomonas sp.* etc.

Materials and methods:

Isolation and Identification of bacterial isolates:

Isolated bacteria collected from Lonar lake, Maharashtra, Grown & maintained on Horikoshi B medium having pH 12. The pH is maintained by 1 N NaOH. On basis of morphological, biochemical analysis were performed.

Production, extraction and confirmation of enzymes:

For proteolytic and amylolytic activity, isolates inoculated on alkaline skim milk agar and alkaline starch agar was used having pH 12 (maintained by 1N NaOH), incubated at 37°C for 48-72 hours. For extraction of crude enzyme protease two isolates inoculate in broth containing 1% casein & incubate at 37°C for 48 hours in shaking condition. Centrifuged at 3000-5000 rpm for 15 min. Clear supernatant serve as crude enzyme, and enzyme activity was checked by zone of solubilization around the well on skim milk agar plate.

Result and Discussion:

In the present study, total 3 samples comprising of 2 water and 1 sediment samples were collected from alkaline lonar lake. From these samples, 8 morphologically different colonies were isolated. Identification of isolates were based on cultural, morphological, and biochemical characteristics.

1. **Screening of isolates for proteolytic & amylolytic activity:** Out of 8 bacterial isolates 3 were found to be positive for casein hydrolysis & starch hydrolysis. The zone of casein hydrolysis given by isolates were 23mm and 25mm respectively. The zone of starch hydrolysis was found to be 5mm each by isolates.
2. **Production & confirmation of crude enzyme :** After centrifugation, the clear supernatant pour into well containing skim milk agar plates. After 48 hours incubation zone of solubilization indicates that crude enzyme may be protease.
3. **Conclusion:**
From above results, it was concluded that the bacteria were present in Lonar lake were grown only in alkaline conditions. These isolates were efficient for production of alkaline protease and amylase. The optimum pH required was 12, the optimum time required is 48-72 hours, and optimum temperature was 37°C. The crude enzyme extracted from the isolate code shows maximum zone of solubilization around well on skim milk agar plates which indicates the crude enzyme may be protease.



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Determination of Antibacterial Activity of Leaf Extract of *Jasminum officinale* Against Oral Pathogens in Ulcer Treatment

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Abstract: From ancient times, plants have been used in traditional medicines for treatment of different ailments. Medicinal plants is one of the richest bio resources for traditional and folk medicines till date. Jasmine is botanically known as *Jasminum officinale* or Jasminie and belongs to the olive family of Oleaceae. Literature report suggest that Jasmine is analgesic, antidepressant, antiseptic, expectorant, aphrodisiac, sedative, stomachic, diuretic, depurative, astringent, stimulating, anti-oxidizing, anthelmintic and anti-inflammatory in nature. The objective was to study antibacterial activity of *Jasminum officinale* extracts against mouth ulcer causing organisms. The antibacterial activity has been studied against *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Bacillus subtilis* & *Enterococcus faecalis* by agar well diffusion method. Leaves extract of *J. officinale* give effective results against oral pathogens causing mouth ulcer. Acetone and Ethanol extracts displayed a good antibacterial activity. The phytochemical studies revealed presence of Carbohydrates, Proteins, Steroids, Alkaloids, Flavonoids, Phenols, Saponins, Glycosides and Tannins. *J. officinale* may prove to be effective medicine for the treatment of ulcer.

Keywords: *Jasminum officinale*, Antibacterial activity, Phytochemical analysis

I. Introduction

From ancient times, plants have been used in traditional medicines for treatment of different ailments. Medicinal plants is one of the richest bio resources for traditional and folk medicines till date. Around 20,000 medicinal plants have been recorded in India. Only 7,000 - 7,500 plants are used for curing different diseases. The antimicrobial potential and antioxidant activity of plants have attracted the attention of scientific community from ancient times. This had lead to increase in the interest of natural substances exhibiting antimicrobial and antioxidant properties. (1)

The treatment of disease began long ago with the use of herbs. Herbs became the sources of many important drugs due to its wide range of therapeutic and pharmacological effects. (2)

Indian system of medicines comprises of Ayurveda, Unani, Siddha, Homeopathy, Naturopathy and Yoga. Each of which uses the herbal constituents in some or the other form, crude drug is not so effective because they have not been tested for efficacy according to rigid pharmacological standards. As the constituents derived from the medicinal plants proved to cure the human disorders they isolated and used for their pharmacological action.

Jasmine is botanically known as *Jasminum officinale* or Jasminie and belongs to the olive family of Oleaceae. Jasmine is analgesic, antidepressant, antiseptic, expectorant, aphrodisiac, sedative, stomachic, diuretic, depurative, astringent, stimulating, anti-oxidizing, anthelmintic and anti-inflammatory in nature. Furthermore, there are other numerous advantages this amazing plant offers to humanity. These benefits have been attributed to its phytochemical, medicinal and pharmacological properties. (3)



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Antibiotic Susceptibility Pattern Of *E. Feacalis* Isolates From Uti Of Pregnant Women In Akola City**Morey S.S.**Department of Microbiology
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Akola**Ali Y.A.**Department of Microbiology
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Akola**Abstract**

The Urinary tract infection accounts for the majority of infection that an average women contract at least once during her life time. The risk of UTI is even greater in the pregnant women as it may lead to termination of pregnancy if not treated properly or if the drug given for treatment is harmful for the fetus. The major cause of UTI in patients is the uropathogens and *Enterococcus feacalis* is one of them causes serious infection. The significant percentage of cases i.e 33.2% were found to be affected with *Enterococcus feacalis*. The antibiotics viz. Fosfomycin, Norfloxacin, Ciprofloxacin etc are the important drugs for the treatment of UTI. The present study has been given more emphasis on isolation of *Enterococcus feacalis* as uropathogens and its susceptibility / resistant pattern against various antibiotics.

Key Words: UTI, *Enterococcus feacalis*, Antibiotics.

Introduction

Urinary tract infection (UTI) is caused by bacteria that attach to the inside lining tissue of the urinary system or tract (1). Pregnant women have a greater risk of developing urinary tract infection. The organism *E. feacalis* account for 2% to 12% of infection (2).

A pregnant woman who develops UTI should be treated promptly to avoid premature delivery and other risks. Some antibiotics are not safe to take during pregnancy and therefore should be avoided (3). The most predominant of all uropathogens is *E. feacalis* which is a major cause of UTI.

Hence the study was undertaken to know the antibiotic resistance/ susceptibility pattern of *E. feacalis* isolates from UTI of pregnant women.

Materials And Methods

The samples of urine collected from pregnant women suffering from UTI are immediately processed for detection of uropathogens, its identification and antibiotic susceptibility pattern.

The sample is centrifuged in sterilized tubes and the pellet is inoculated on UTI agar which is highly specific for majority of bacteria causing urinary Tract Infection. Also the pellet is simultaneously inoculated on MacConkey agar and EMB agar. All plates are incubated at 37° C for 24 hours. The *E. feacalis* is identified on the basis of the color of its colony and is accordingly separated on its specific media as well as nutrient media.

The *E. feacalis* is further identified on the basis of morphology, biochemical and specific cultural characteristics i.e growth on MacConkey agar, EMB agar.

Antibiotic susceptibility testing was done by Kirby-Bauer Technique

Media Used: The media used was Mueller Hinton agar. The antibiotics used were Ampicilin, Amoxicilin, Gentamycin, Nitrofurantoin, Ciprofloxacin, Lomefloxacin, Norfloxacin, Ofloxacin, Trimethoprim, Sulphamethoxazole, Cephalexin, Cefuroxime, Cefactor, Cefpodoxime, Cephotaxime, Ceftriaxone, Penicillin, Cefepime, Fosfomycin, Virginamycin.

Preparation of Inoculum:

UTI isolate (*E. feacalis*) was inoculated in 5ml sterile nutrient broth and incubated at 37°C for 2 to 8 hours till moderate turbidity developed. The inoculum turbidity was compared with by mixing 0.5ml of 1.175% Barium chloride and 99.5ml of 0.36N Sulphuric acid, as recommended by W.H.O. wherever necessary the inoculum was diluted or incubated further to attain comparative turbidity.



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सामर्थ्यवान राष्ट्रान्च्या निर्मितीसाठी युवकांची भुमिका**डॉ. राजेश चंद्रवंशी**शारीरिक शिक्षण व क्रीडा संचालक
श्री रा.ल.तो. विज्ञान महाविद्यालय, अकोला**सारांश**

राष्ट्र या शब्दाचा अर्थ हा खुप व्यापक व विविध अर्थ समाविष्ट असलेला आहे. राष्ट्र म्हटले की त्यामध्ये भौगोलिक, सामाजिक, राजकीय व धार्मिक अश्या विविध संकल्पनेचा प्रभाव दिसून येतो. राष्ट्राला सामर्थ्यवान करण्याच्या दृष्टीने त्या राष्ट्रातील युवकांची भुमिका या बाबत उहापोह करणे आवश्यक आहे. राष्ट्रीय युवा धोरण २०१४ नुसार १५ ते २९ वयोगटातील सर्वांना युवक असे संबोधल्या जाते. सद्यस्थितीत युवकांच्या राष्ट्र संबंधी विचार, अपेक्षा व राष्ट्र विकासामध्ये योगदान या सारख्या घटकांवर प्रकाश टाकणे आवश्यक आहे. सामर्थ्यवान राष्ट्राच्या निर्मितीसाठी युवकांची भुमिका कशी असावी. या संदर्भात युवकांची वैयक्तिक, सामाजिक, राजकीय व आर्थिक स्थिती कशी आहे व त्यानुरूप सामर्थ्यवान राष्ट्राच्या निर्मितीसाठी त्याचे योगदान व महत्व या ज्वलंत विषयावर गहन अध्ययन करणे या संशोधनाचा मुख्य उद्देश आहे. युवकांची वैयक्तिक, सामाजिक, राजकीय व आर्थिक परिस्थितीशी संबंधीत सर्व समस्याची जाणीव व युवकांना वास्तविकतेचे दर्शन करून देणे, योग्य गोष्टी करिता समर्थन, मार्गदर्शन, सहकार्य किंवा प्रेरणा देणे ही काळाची गरज आहे. युवक हा सशक्त, उच्च शिक्षित, संशोधनाची आवड असलेला, सुजाण नागरिक, आर्थिक दृष्ट्या स्वयंभू, राजकीय व सामाजिकदृष्ट्या जागृत असावा. सामर्थ्यवान राष्ट्राच्या निर्मितीसाठी राष्ट्र समोरील समस्याच्या निराकरणाच्या दृष्टीने, परिस्थिती व विकासात्मक घटका नुसार युवकांचा सर्वांगीण विकास व योगदान हे अत्यंत महत्वाचे आहे. सशक्त युवकच हा सामर्थ्यवान राष्ट्र निर्मितीचा जणु पायाच आहे. सामर्थ्यवान राष्ट्राच्या निर्मितीसाठी युवकांची भुमिका अत्यंत महत्वाची आहे.

प्रस्तावना

राष्ट्रीय युवा धोरण २०१४ नुसार १५ ते २९ वयोगटातील सर्वांना युवक असे संबोधल्या जाते. सद्यस्थितीत युवकांच्या राष्ट्र संबंधी विचार, अपेक्षा व राष्ट्र विकासामध्ये योगदान या सारख्या घटकांवर प्रकाश टाकणे आवश्यक आहे. युवकमध्ये एक शक्ती असते जी कोणतेही कार्य जोमाने करू शकते. सामर्थ्यवान राष्ट्राच्या निर्मितीमध्ये युवकांची भुमिका ही कशी असावी व त्याकरिता युवकांमध्ये कोणकोणते सामर्थ्य आहे किंवा जीवना प्रती विचारसरणी यावर प्रकाश टाकण्याच्या दृष्टीने विचार करणे ही काळाची गरज बनली आहे.

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The Impact of Science and Technology on Sports Skills

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Abstract

The human body has its limitations. Man cannot function like a machine. With the help of science and technology, there have been widespread changes in all areas of human life and human life is made faster and happier. Mathematics, Physics, Electronic, Computer, Medical Science and Sports Engineering etc subject related to science stream is connected in sports field to develop higher level of sports performances. There are different types of skills to perform the game. Speed, Stamina, Endurance, Flexibility, Muscular Power and Strength is needed when performing game skills on higher level. Body mind coordination is a most important part to perform higher level of sports skill. Sports engineering includes designing of equipments, building facilities, analysis sports skill performance, regulating standard ensuring safety equipment for players and developing easy training method for coaches. Mathematics, Physics, Electronic, Computer, Medical Science and Sports Engineering these subjects are very much useful to players for choosing perfect sports skill, training method, proper coaching, level of physical fitness, body mind coordination and body movements to perform higher level of Sports Skills.

KeyWords: Science, Technology, Sports Engineering, Sports Skills

Introduction:

There has been widespread progress in every area of human life. In ancient times, struggle was the foundation of human life. The human body has its limitations. Man cannot function like a machine. With the help of science and technology, there have been widespread changes in all areas of human life and human life is made faster and happier. Sports and Physical Activities are the basic and entertaining part of human life. Sports are entertaining components of human life. The field of sports and physical activity is wide and varies widely between individuals. The field of sports and physical activity is very broad and involves a lot of sports. There are different types of skills to perform the game. Body mind coordination is a most important part to perform higher level of sports skill. Speed, Stamina, Endurance, Flexibility, Muscular Power and Strength is needed when performing game skills on higher level. Although there are limitations to the movement of the human body, it is possible to achieve the highest level of skill as per sports with the help of science and technology.

Purpose

The purpose of this research is to know the impact of science and technology on sports skills.

- Science & Technology

The scientific approach is a factor involved in every field, and the field of sports is no different. Mathematics, Physics, Electronic, Computer, Medical Science and Sports Engineering etc subject related to science stream is connected in sports field to develop higher level of sports performances.

- Mathematics

In mathematics, mainly in two subjects, one specially assists in periodic examination of the field of skill in mathematics and the other in geometry mathematics. The mathematics subject helps to determine the skill level and it is easy to analyze based on the information received. Geometry provides assistance in analyzing the various sports arenas and the latest developments in the field of sports as well as analyzing sports skills.

- Physics

Work and energy are among the most important concepts of physics. Both work and energy play an important role in sports. In physics, work is defined as the result of a force moving an object at a certain distance. First, the athletes transform chemical energy into kinetic energy of their body while running. Applying Newton's kinetic rules to physical activity certainly raises the level of skill in the game.

- Electronics & Computer:

The unique combination of Electronic and Computer subject is very helpful in modern technology. High resolution Camera & Video recording Camera is very important to catch live action of players while performing sports skill at higher level. These photos and video clips replay is very helpful to rectify to find the faults and findings at the time of performing sports skills. At the time of matches or live sports action camera and video clip is a proof for judgment. In cricket, controversy has surrounded bowling an illegal delivery of the ball or detecting a 'leg before wicket' infringement. This has been attempted to be resolved using line judgment



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Science And Technology Helps To Improve Sports Skill

Dr. Rajesh D. Chandrawanshi

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Introduction

There is worldwide progress in every area of human life. Struggle is the base of human life in modern era. The human body cannot function like a machine and it has its limitations. The performance of skill in any field and in activities of human body depends upon body structure, heredity, gender, age factors, weather, diet plan, guidance, training and coaching methods. Due to science and technology there have been tremendous changes in all areas of human life. Sports and Physical activities are the basic need of human body for fitness. Games and Sports are the most important factors for fitness with entertainment and also very much useful for leisure time. The field of games, sports and physical activity is very broad and involves a lot of physical activities and sports skill. Fitness is most important for performing higher level of sports skill. Speed, Stamina, Endurance, Flexibility, Muscular Power and Strength these concepts are included in fitness. Body mind coordination is a most important to achieve higher level of sports skill at the time of performance. Human body has limitations to perform sports skill in continuous higher level. Science and technology is very useful to analysis the lacuna in body movements and prepared latest sport's equipment to support sports skill performance.

Purpose

The purpose of this research is to know how science and technology helps to improve sports skills.

Science

Science is a most important stream for development in every field of human life. Scientific approach makes human life progressive, safe, lavish and full of facilities. The concept of science is very wide but generally Mathematics, Physics, Electronics, Computer, Information Technology, Microbiology, Bio-Chemistry and Medical Sciences etc. these subjects are included in science concept. In the field of sports science related some subjects i.e. Anatomy, Kinesiology, Bio mechanical aspects, Physiology and Test and measurements are included. Now a day's sports field requires more scientific based knowledge to improve sports activities level.

Mathematics

Mathematics is a common subjects which supportive every subject for record maintain. Mathematics includes the study of quantity, structure (algebra), space (geometry) and change (mathematical analysis). Mathematics is the science that deals with the logic of shape, quantity and arrangement. Mathematics is very much helpful in Sports field. In the field of sports activities mathematics helps to prepared skill based parameters, data record and data analysis. Without geometry helps the various sports arenas and the latest developments in the field of sports as well as analyzing sports skills is not possible. Algebra, Geometry and Mathematical Analysis is important, supportive and directive to achieve higher level of sports skills.

Physics

Physics related Measurement, Motion in One Dimension, Motion in Two Dimensions, Relative Motion, Newton's Law, Applications of Newton's Laws, Gravity, Work and Energy. Linear Momentum and Collisions, Rotational Dynamics & Properties of Matter these concepts are plays an important role in sports skill performance.

Electronics, Computer & Information Technology

The unique combination of Electronic, Computer & Information Technology these subjects are very helpful in development of modern technology based on sports skill performance. Sports skills performance related data collection with accurate electronics gadgets, perfect huge data timely storage with the help of computer, live records with the help of video, and scientific study on available data with live action with the help of computer software's. Information technology is important for storing, retrieving and sending information at worldwide level. Worldwide publicity of sports skill performance is height lighted through

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Insect Word: Diversity Of Insects Thrips

S. M. Nagrale

Department of Zoology, Shri R.L.T.College of Science, Akola (M.S.)

Abstract

Thrips are minute insects which are usually a few millimeters long. It has fringed, banded wings as well as asymmetrical sucking and piercing mouthparts in which only the left-hand side mandible is developed. They enjoy a wide range of distribution, habits and ecological habitat most of them are phytophagous, very few are predaceous feeding on mites, scales, psocids and ericocids respectively. While mycophagous or fungus feeding thrips are more common. Order Thysanoptera divided into two suborders i.e. Terebrantia and Tubulifera. The thrips shows many peculiarities in their behavior and life history.

Key words: *Thrips, fringed wings, mycophagous, phytophagous*

Introduction:

Thrips are minute insects which are usually a few millimeters long. In spite of their small size, unattractive colouration and obscure habit, thrips are endowed with remarkable structural peculiarities unobserved among the other insects. The majority of the species has fringed, banded wings as well as asymmetrical sucking and piercing mouthparts in which only the left-hand side mandible is developed

They are distributed worldwide predominating in tropical, subtropical, and temperate regions. They enjoy a wide range of distribution, habits and ecological habitat. They occur on the tender, succulent parts of the plants, or under the barks of dead and drying twigs or among decaying leaves of grass, feeding on fungus spores and hypae. Some of them produce and inhibit plant galls, while others are inquiline living inside galls of thrips or other insects. Though most of them are phytophagous, very few are predaceous feeding on mites, scales, psocids and ericocids respectively. While mycophagous or fungus feeding thrips are more common. They feed on the spore of wheat rust and coffee leaf rust and little other plant infected fungus. A large number of species are considered pest, because they feed on plant with commercial value, while some acts as a vectors of plants virus and bacterial diseases. While some act as predators of crop pests and also serve as weed control agents.

In 1744 De Geer first described these insects as Physapus, based on their several unique and striking features, such as the nature of wing with long, fine fringes along their margins, possessing characteristic feeding apparatus, with a striking asymmetry of the component mouth parts, the vestigial right mandible, the protrusible bladder like structure at the end of tarsus or physopoda, and the occurrence of a prepupal stage during metamorphosis.

In 1836 Haliday ranked these insects to the Order Thysanoptera, and Linnaeus placed the species in a genus called as Thrips. The species, however, possess some common characteristics such as fringed wings and bladder feet, which have made their inclusion in the order Thysanoptera, derived from the Greek word meaning *thysanos* (fringe) and *pteron* (wing). The common name thrips is also derived from the Greek, meaning wood louse. Other common names for thrips include thunderflies, thunderbugs, storm flies, thunderblight and corn lice.

Classification Diversity:

Order Thysanoptera divided into two suborders i.e. **Terebrantia** and **Tubulifera**. Thrips belonging to Terebrantia possess a distinct saw like ovipositor, fore wings with a system of veins and sometime cross veins, a distinct chaetotaxy and 2 to 8 segmented maxillary palp and the maxillary stylate confined to the mouth cone. Tubulifera are so called because the 10th abdominal segment is drawn into a tube and in the species of this suborder the ovipositor is internal and flexible structure. The four wings without a system of veins, cross veins and setae, the fringes nearly straight, never wavy, maxillary palp always two segmented and maxillary stylate always retracted far back into head. Sigmoid setae are also present on the abdominal tergites to hold the wings while at rest.

The current list of the thrips in the world contains about 7400 species and 1200 types are placed in a single order **Thysanoptera** with nine families, eight of these belonging to **Terebrantia** (**Uzelothripidae**, **Merothripidae**, **Aeothripidae**, **Melanthripidae**, **Adiheterothripidae**, **Faurillidae**, **Heterothripidae**, **Thripidae**.) and **Tubulifera** includes only a single family the **Phlaeothripidae**. From India, more than 400 species of Thrips belonging to about 200 genera have so far been described by various authors

The suborder **Tubulifera** comprises a single family, the **Phlaeothripidae** with about 3500 described species, whereas the suborder **Terebrantia** comprises about 2400 species in eight families



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Carbon Monoxide (CO) ppm Density Measurement with High & Low Heating Cycles using MQ7 Discrete Semiconductor Sensor

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S.M. Nagrale,

Department of Zoology,
Shri R.L.T. College of Science, Akola

Abstract

The CO equally affects healthy and unhealthy people. The breathing of CO can cause headache, vomiting, nausea and dizziness. If the level of CO is high enough, it a person may become unconscious or die. Exposure to moderate and high levels of CO over long periods of time has also been linked with increased risk of heart disease. If more amount of CO is taken in breathing, it may reduce the amount of oxygen carried by haemoglobin around the body in RBC. Due to this vital organs, such as brain, nervous tissues and the heart, do not receive enough oxygen for proper working of bodily functions. So to measure the density of CO in surrounding atmosphere we have used the reliable MQ7 sensor for precise measurements. The sensitive material of MQ-7 gas sensor is SnO₂, which with lower conductivity in clean air. It make detection by method of cycle high and low temperature, and detect CO when low temperature (heated by 1.5V). We have designed simple Arduino UNO based system, to convert change of conductivity to correspond output signal of gas concentration. MQ-7 gas sensor has high sensitivity to Carbon Monoxide. The sensor could be used to detect different gases contains CO, it is with low cost and suitable for different application.

Nomenclature

R_s	Surface resistance of MQ7	s	surface
R_L	Series wound load resistance	L	load
V_c	Transistor collector voltage	c	collector
V_{RL}	Load voltage measured	RL	load resistor

Introduction

The system of CO density measurement uses the most reliable CO sensor, MQ7 for getting precise measurements. As per the data sheet of MQ7 carbon monoxide sensor, it is necessary that the MQ7 sensor must be activated through high and low heating cycles in order to get proper measurements. During low temperature phase, CO is absorbed on the plate of the sensor, producing accessible data. During high temperature phase of the sensor, the absorbed CO and other compounds by the sensor, evaporate from the sensor plate, cleaning it up for the next measurement, as give in the code of this project. *This project uses Arduino Nano ATmega328p microcontroller module with discrete MQ7, carbon monoxide sensor module with few other accessories.*

Mathematical Analysis

The surface resistance of the sensor R_s is obtained through effected voltage signal output of the load resistance R_L which series-wound. The relationship between them is described:

$$\frac{R_s}{R_L} = \frac{(V_c - V_{RL})}{V_{RL}}$$

The output signal when the sensor is shifted from clean air to carbon monoxide (CO), is found to have abrupt changes. The output signal measurement is made within one or two complete heating period (*90 seconds from high voltage to 60 seconds for low voltage*).

Sensitive layer of MQ7 gas sensitive components is made of SnO₂ with stability, so it has excellent long term stability. Its service life can reach 5 years under using condition. The processed result is displayed on the Serial Monitor in Arduino software. There are three values under monitoring: Raw value, Heating time of MQ7 Sensor, CO ppm value. The circuit can be modified to display the results of 16x2 LCD display. The values measured in this circuit are compared with the Indian PUC standard values.



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PHYTOCHEMICAL AND MEDICINAL USES OF ARGYREIA NERVOSA PLANT**S.M. Nagrale**Shri R.L.T. College of Science, Akola (MS), India
sushilnagrale75@gmail.com.**ABSTRACT**

Argyreia nervosa is a perennial climber native to the Indian subcontinent and introduced to numerous areas worldwide. Though it can be invasive, it is often prized for its aesthetic and medicinal value. Common names include **vidhara** (in Sanskrit), **elephant creeper** and **woolly morning glory**. *Argyreia nervosa* seeds contain various metabolites like ergoline, alkaloids such as ergine. Study reported presence of ergometrine, lysergol, lysergic acid and other alkaloids that shows its pharmacological effects. It is a popular Indian medicinal plant, which has long been used in traditional Ayurvedic Indian medicine for various diseases. This plant was pharmacologically evaluated for hepatoprotective, antioxidant, antiinflammatory, antihyperglycemic, antidiarrheal, antimicrobial, antiviral, nematocidal, antiulcer, anticonvulsant and analgesic activities. Phytochemical, medicinal values and dietary uses of *Argyreia nervosa* plants are discussed here.

Keywords: *Argyreia nervosa*, alkaloids, ergoline, leaf, seeds

Introduction

There has been an explosion of scientific information concerning plants, crude plant extracts and various substances from plants as medical agents during the last 20 to 30 years. Numbers of plants are claiming various medicinal uses and many researches are going on in this view. One such plant, *Argyreia nervosa* synonym of *Argyreia speciosa* (L. f) Sweet, which have various medicinal properties is widely used in Ayurveda, the ancient traditional medicinal system in India. *Argyreia nervosa* is a perennial climber native to the Indian subcontinent and introduced to numerous areas worldwide. Though it can be invasive, it is often prized for its aesthetic and medicinal value. Common names include **vidhara** (in Sanskrit), **elephant creeper** and **woolly morning glory**.

Taxonomy

Kingdom: *Plantae*
Subkingdom: *Tracheobionta*
Super-division: *Spermatophyta*
Division: *Magnoliophyta*
Class: *Magnoliopsida*
Subclass: *Asteridae*
Order: *Solanales*
Family: *Convolvulaceae*
Genus: *Argyreia*

Synonyms

Argyreia speciosa (L. f.) Sweet, *Argyreia nervosa* (Burm.f.) Bojer

Vernacular name

Hindi: Samandar-ka-pat, Samundarsokha, Ghav-patta
Marathi: Samandarshokh, Samudrasoka
Sanskrit: Vidhara, Vryddhadaraka, Samundrasosha
Urdu: Samandarsotha
English: Elephant creeper, Woolly Morning-Glory

Material and Methods**Collected and preparation of material**

The fresh Aerial part collected from local area, (Dist-Akola, Maharashtra). The plant was authenticated by Botanical Survey of India (BSI) and reference book. The whole aerial plant part was dried under shade and powdered by the help of mechanical process. Powder of whole aerial part was stored in a suitable place.

Crude Extraction for Phytochemical evaluation

The dried powder plant material was extracted with ethyl acetate and methanol, by successive cold maceration method. The powdered drug was extracted for 7 days with each solvent. The extract was then filtered using filter paper and the filtrate so obtained was evaporated in a distillation unit (Harborne, 1998).

Qualitative tests for the presence of plant secondary metabolites such as carbohydrates, alkaloids, flavonoids, proteins, saponins and glycosides were carried out on powder drug

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**Impact of Zinc Sulphate on Gills of Fish
*Ophiocephalus punctatus***

Sawarkar A. S

Department of Zoology, Shri R. L. T. College of Science, Akola 444001

ABSTRACT

Due to the fast industrialization and urbanization, the river pollution in India has reached to peak of threshold limits. The continuous discharge of effluent containing heavy metals and their compounds at an unprecedented and constantly increasing rate, even below permissible level from various industries into aquatic bodies may result in accumulation and subsequent magnification up to dangerous level due to their toxicity, non-degradable nature and solubility in water. Heavy metals enter in the organism through food chain. It causes disorder in the aquatic ecosystem which leads to effect on aquatic life. In the present paper investigation was undertaken to study the effect of zinc sulphate on gills of the fresh water fish *Ophiocephalus punctatus*. The toxicity of zinc even at sublethal level causes drastic changes in the gill histology. The estimated protein concentration increased, whereas, glycogen and lipid content were found to be reduced in the gills during the exposure periods.

KEY WORDS: Gills, Glycogen, Lipid, Protein, Zinc.

INTRODUCTION

Zinc enters in aquatic habitats through various ways. Zinc is one of the essential elements required by aquatic animal like fish. But, if enters in body more than requirement, it becomes harmful and may adversely affect the behaviour and physiology of organism (Kumar 2015). Zinc is an essential and beneficial element in human metabolism. Zinc in traces is essential to sustain biological processes such as optimum body growth, development, reproduction and as immune stimulant. It's presence is essential for smooth working of various important enzymes like DNA and RNA polymerase, reverse transcriptase, alcohol dehydrogenase, sorbitol dehydrogenase, glucose -6- dehydrogenase etc. Its deficiency leads to retardation of growth, chronic renal disease,

diagnosis, cessation of estrous and menstrual cycle in mammals (Sawarkar 2017).

It is required in very little quantity for normal growth and functioning of the aquatic organisms like fish. But, if consumed in excess amount, Zinc starts to accumulate in different organs of fish (Nussey 2000). Toxicity of the heavy metals causes morphological and biochemical alterations in the aquatic organisms (Elaiyaraja 2018). The excessive zinc from the environment may enter into the fish body through nutrients, general body surface and gills. Gills are first organs which are affected by this toxicant. Zinc is mostly found in nature as the sulphide.

MATERIAL AND METHODS

The fish, *Ophiocephalus punctatus*, common air breathing fresh water teleost, which are locally priced as food fish and abundant in various lakes near Amravati (Maharashtra state in India) were used in the present study. Fish weighing 20-25 gm and between 10-12 cm in length were purchased from local fish market. The fish were treated with 0.1% solution for 1 to 2 minutes to clear any dermal infection. They were maintained under laboratory condition in aquarium for acclimatizing them for seven days. They were fed with commercial feed. The water in the aquarium is changed daily to remove detritus.

a) Water used - Water used throughout experiment was aged tap water. The physicochemical parameters of aged tap water were determined periodically (Table 1) as per standard method for

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Editors Communique

Have we tamed the coronavirus? May be yes,
as pandemics do not die, they can only be faded !

Science and technology has made it possible, in the shortest span of time, it has shown that with firm determination and international cooperation, we can win over the onslaughts of even the worst of the pandemics. COVID-19 is perhaps fading over now, due to our coordinated efforts worldwide. Though we have lost millions, in the two year period, partly due to the mishandling of the viral attacks and somewhat by our own follies and carelessness. Anyway lessons learnt from the past, always make us more stronger and determined. Let us now not relax and work on a better mode, as all is still not well yet. The almost taming of the virus and its cousins have indicated some of the concealed failures, on which we have to focus now. We have to be more vigilant, and even a bit of laxity can spoil the good work done. On societal and governmental parts, utmost care and caution is required on a long term basis.

On behalf of *Bioscience Biotechnology Research Communications*, we falter at words to express our deep sense of solitude and grief on the catastrophic events of the world wide pandemic, spanning over two years now. We pray for the strength to bear this universal calamity and come up with long lasting fortitude to eradicate it soon.

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Quality publication is one of the ways to keep science alive, and good journals have a leading role to play in shaping science for humanity! As teachers, we have great responsibilities, we have to advocate our students to accomplish and show them the path to test their mettle in hard times to excel, especially in the post COVID 19 era. Science and its advocates will rise more to the occasion and will soon provide succor to the already grief stricken humanity.

Sharique A. Ali, PhD

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Effect Of Zinc Toxicity On Some Haematological Parameters Of Fish, *Ophiocephalus Punctatus***A. S. Sawarkar**

Department of Zoology, Shri R. L. T. College of Science, Akola 444001

Abstract

The present study aimed to evaluate some haematological changes resulting from the exposure of the freshwater fish, *Ophiocephalus punctatus* to the sublethal concentration of 6 mg/l of zinc sulphate in water for a period of 7, 14, 21 and 28 days. The studied haematological parameters were haemoglobin content, haematocrit percentage, erythrocyte count, total leucocyte count and mean corpuscular haemoglobin. Zinc sulphate caused reduction in haemoglobin content and increase in haematocrit values. Tremendous increase in erythrocyte count after 7 days zinc sulphate treatment was recorded in the experimental fish but later on there was significant decrease in the erythrocytes count after 28 days. Rise in leucocyte count was observed after 7 days zinc sulphate treatment but later on the number decrease. Fish also showed significant drop in mean corpuscular haemoglobin after 7 and 14 days, followed by slight increase. These haematological parameters may be used as an indicator of stress in fish induced by zinc toxicity.

Keywords: *Ophiocephalus punctatus*, Zinc sulphate, haematological parameters, toxicity.

Introduction

Factories discharge large amount of waste product into the river or nearest streams, lakes etc., which may join the river and thereby the ocean. Therefore, life in the water system is affected and biopurification system of water gets disturbed. Zinc is essential in small quantities for normal development of the organism but if consumed in excess amount, it may become toxic. The excessive zinc from the environment may enter into the fish body through nutrients, general body surfaces and gills. Toxic concentration of zinc compound cause adverse effect in the morphology, physiology and haematology of the fish. Srivastava and Punia (2011) studied the haematological and biochemical changes resulting from the exposure of common carp *Cyprinus carpio* to sublethal concentration of zinc in water at different time interval. Celik *et al.* (2013) investigated the changes in haematological and innate immune parameters and accumulation in the liver, gills and muscle tissues of *Oreochromis mossambicus* exposed to sublethal concentrations of zinc. Haematological alterations are used for rapid evaluation of chronic toxicity of compound. Hence, haematological investigation is important in toxicological research. Ganesan and Karuppasamy (2015) analyzed the impact of sublethal concentration of zinc on some hematological parameters of *Channa punctatus* under long term exposure. Aim of current study was to evaluate some haematological parameters like haemoglobin content, haematocrit value, erythrocyte count, total leucocyte count and mean corpuscular haemoglobin in freshwater fish *Ophiocephalus punctatus* exposed to sublethal dose at different time interval.

Material and Methods

The fish, *Ophiocephalus punctatus*, common air breathing freshwater teleost, were used in the present study. Fish weighing 20-25 gm and up to 12 cm in length were purchased from local fish market. Then they were treated with 0.1 % KMnO₄ solution for 2 minutes to clear dermal infection. Fish were maintained under laboratory condition in aquarium for one week. They were fed with commercial feed. The water in the aquarium was changed daily to remove detritus.

a) Water used - Aged tap water was used throughout the experiment. The physiochemical parameters of water was determined periodically as per standard method for examination of water and waste water (APHA, 1998).

Water having pH = 7.4 ± 0.5 ; Temperature = $25^{\circ}C \pm 2^{\circ}C$; Dissolved oxygen = 6.3 mg/l ; and Total hardness = 65 – 90 mg/l was used to keep fish. The same water also served a control medium throughout the experiment.

b) Test Toxicant - Zinc sulphate, a salt of zinc was used as toxicant for present study.

c) Bio assay study - To study effect of toxicant ZnSO₄ on haematological parameters LC₅₀ was determined for 24 hours, it was found to be 20.5 mg / l. The sublethal concentration of 6 mg of ZnSO₄ / l of water was selected. For haematological study fish were taken at 7 days, 14 days, 21 days and 28 days.



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SYNTHESIS OF PYRIMIDINE LINKED PYRAZOLE HETEROCYCLICS BY MICROWAVE IRRADIATIVE CYCLOCONDENSATION AND EVALUATION OF THEIR INSECTICIDAL AND ANTIBACTERIAL POTENTIAL

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Abstract : The (4,6-dimethyl-pyrimidin-2-yl)-(5-methyl-2-substituted benzoyl/isonicotinoyl-pyrazol-3-yl)-amines have been prepared by cyclocondensation of N-(4,6-dimethyl-pyrimidin-2-yl)-3-oxo butyramide with substituted acid hydrazides under microwave. Synthesis of required 3-oxo butyramide was carried out by microwave irradiative condensation of 2-amino-4,6-dimethyl pyrimidine with ethyl acetoacetate. On acylation, the pyrimidine linked pyrazol-3-yl amines gave mono/di-acetyl derivatives. Structures of synthesized compounds were determined by IR, ¹H-NMR, mass spectroscopic studies and elemental analysis as well as chemical transformation. So as to establish the relation between structure and biological activity, synthesized compounds have been evaluated against Pseudococcidae insects for their insecticidal activity and also against some selected microorganisms for antibacterial potential.

Index Terms - Pyrimidine, pyrazole, microwave, insecticidal, antimicrobial.

I. INTRODUCTION

In synthetic organic chemistry, the technique of microwave irradiation has so many advantages over the heating by conventional method¹. For accelerating time consuming reactions as well as for high speed parallel synthesis of biologically active molecules, the technology of high density microwave irradiation has emerged as a most useful technique in organic synthesis^{2,3}. In literature, pyrazole derivatives are well established and their activity covers the areas like antimicrobial, antiviral, antitubercular, antihistaminic, anticonvulsant and antidepressant⁵⁻⁸ along with excellent analgesic and anti-inflammatory activities^{9,10}. The pyrazoles linked with various other heterocyclics are found to contribute to different chemotherapeutic effects. Pyrazole derivatives were also reported to induce activities like antitumor, antileukemic and antiproliferative¹¹⁻¹⁴. Investigations in chemistry revealed good about insecticidal activities related to pyrazole chromophore^{15,16}. Different chemotherapeutic activities have been also ascribed to pyrimidine ring⁷.

From the literature, it was found that N-1, C-3, C-4 positions are so much important for structure activity relationship. For better chemotherapeutic activities, C-3 should be linked to various heterocyclics¹⁷. With relevance to these findings, we reported herein synthesis of pyrimidine linked pyrazole heterocyclics by microwave irradiative cyclocondensation and evaluation of their insecticidal and antibacterial potential.

II. RESULTS AND DISCUSSION

Synthesis of N-(4,6-dimethyl-pyrimidin-2-yl)-3-oxo butyramide (**1**) was carried out by condensation of 2-amino-4,6-dimethyl pyrimidine (0.01 mole) with ethyl acetoacetate (0.01 mole) in solvent free condition using microwave. Then under microwave conditions, the compound (**1**) was reacted with substituted acid hydrazides (**2a-d**) (0.01 mole) in ethanolic medium to yield (4,6-dimethyl-pyrimidin-2-yl)-(5-methyl-2-substituted benzoyl/isonicotinoyl-pyrazol-3-yl)-amines (**3a-d**). On acylation using acetic anhydride and acetic acid, the amines (**3a-d**) gave mono/di-acetyl derivatives (**4a-d**) (**Scheme I**). It was found that, the microwave induced synthesis received high product yield with more purity and enhanced rate of reaction than conventional heating. Structures of synthesized compounds are fully supported by IR, ¹H-NMR, mass spectroscopy studies and showed single spots in TLC.

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**MICROWAVE ASSISTED SYNTHESIS OF SOME PYRIMIDINE LINKED THIADIAZOLIDINES AND EVALUATION OF THEIR BIOLOGICAL ACTIVITIES****Kalpana A. Palaspagar and Pradip P. Deohate ***Department of Chemistry, Shri Radhakisan Laxminarayan Toshniwal College of Science,
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Corresponding Author*Dr. Pradip P. Deohate**Department of Chemistry,
Shri Radhakisan
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College of Science,
Akola-444001, India.**ABSTRACT**

In the present work efforts are made for microwave assisted synthesis and characterization of series of 1-(5-aryl/alkylimino-2-phenylimino-[1,3,4]-thiadiazolidin-3-yl)-2-(4,6-dimethyl-pyrimidin-2-yl-amino)-ethanones. The reaction initiated by reacting 2-amino-4,6-dimethyl-pyrimidine with ethyl chloroacetate to give ethyl (4,6-dimethyl-pyrimidin-2-yl-amino)-acetate which on further reaction with hydrazine hydrate afforded (4,6-dimethyl-pyrimidin-2-yl-amino)-acetic acid hydrazide. The hydrazide was reacted with N-aryl/alkyl isothiocyanates and further with N-phenyl isocyanodichloride and basified to afford the title compounds exhibiting differently substituted constrained pharmacophores. The purity of compounds was checked

by TLC and constituents of compounds delineated by chemical transformations, IR, ¹H-NMR and mass spectral studies. The title compounds were assayed for their biological activities.

KEYWORDS: Microwave, pyrimidine linked thiadiazolidines, biological activities.**INTRODUCTION**

The heterocyclic compounds especially with distinguished pharmacological activities have proved to be excellent and versatile drugs in the field of medicinal chemistry.^[1] Pyrimidine as a heterocyclic compound is an excellent core structure with diversified therapeutic applications.^[2] Its fascinating use as a medicinally important compound is evidential from its varied biological properties.^[3] Similar to pyrimidine; thiadiazolidines^[4-8] also shows remarkably unique properties like antibacterial, anti-inflammatory, antifungal, anti-tubercle,



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Study of Microwave Assisted Synthesis and Biological Activities of Some Pyrimidine Linked Oxadiazole Pharmacophores**Kalpana A. Palaspagar,
Pradip P. Deohate***Department of Chemistry,
Shri Radhakisan Laxminarayan
Toshniwal College of Science,
Akola 444001, India**Abstract**

In present work microwave assisted synthesis of (5-aryl/alkylamino-[1,3,4]-oxadiazol-2-yl-methyl)-(4,6-dimethyl-pyrimidin-2-yl)-amines have been carried out. Initially ethyl (4,6-dimethyl-pyrimidin-2-yl-amino)-acetate was prepared by reacting 2-amino-4,6-dimethyl-pyrimidine with ethyl chloroacetate. It was further reacted with hydrazine hydrate to afford (4,6-dimethyl-pyrimidin-2-yl-amino)-acetic acid hydrazide. This hydrazide was then reacted with N-aryl/alkyl isothiocyanates followed by oxidative cyclization using alkaline ethanolic solution of iodine in presence of potassium iodide to afford the respective title compounds with differently substituted pharmacophores. The constitutions of synthesized compounds were delineated on the basis of chemical transformation, elemental analysis, equivalent weight determination and IR, ¹H-NMR, mass spectral studies. Progress of the reactions was monitored by TLC. Title compounds were screened for their biological activities.

Keywords: Microwave, pyrimidine linked oxadiazoles, biological activities.

Introduction

The heterocyclic compounds especially with distinguished pharmacological activities have proved to be excellent and versatile drugs in the field of medicinal chemistry¹. Pyrimidine as a heterocyclic compound is an excellent core structure with diversified therapeutic applications². Its fascinating use as a medically important compound is evidential from its varied biological properties³. Similar to pyrimidine⁴⁻⁵; 1,3,4-oxadiazoles derivatives are introduced in medicinal substances as antibacterial, anti-inflammatory, antifungal, anti-tubercle, antiviral agents⁶⁻⁸. Oxadiazole ring is also used as a substantial part of the pharmacophore, which have anti-proliferative activity⁹. The fusion of pyrimidine nucleus with oxadiazole derivatives proved to be excellent biological compounds¹⁰⁻¹².

In the present work efforts are made for microwave assisted synthesis¹³⁻¹⁴ and characterization of series of (5-aryl/alkylamino-[1,3,4]-oxadiazol-2-yl-methyl)-(4,6-dimethyl-pyrimidin-2-yl)-amines.

Results and Discussion

The starting product ethyl (4,6-dimethyl-pyrimidin-2-yl-amino)-acetate (2) was prepared by the reaction of 2-amino-4,6-dimethyl pyrimidine (1) and ethyl chloroacetate in 1,4-dioxane medium using anhydrous potassium carbonate as a catalyst². The product ethyl (4,6-dimethyl-pyrimidin-2-yl-amino)-acetate (2) was reacted with hydrazine hydrate in 1,4-dioxane to give (4,6-dimethyl-pyrimidin-2-yl-amino)-acetic acid hydrazide (3) and further reacted with N-phenyl isothiocyanate (4a) to afford (4,6-dimethyl-pyrimidin-2-yl-amino)-acetic acid N-(N'-phenyl-thioamido)-hydrazide (5a). The compound (5a) was transformed into (4,6-dimethyl-pyrimidin-2-yl)-(5-phenyl-amino-[1,3,4]-oxadiazol-2-yl-methyl)-amine (6a) by oxidative cyclization using alkaline ethanolic solution of iodine in presence of potassium iodide with evaluation of hydrogen sulphide gas. Most of these reactions were carried by microwave irradiation. These reactions were extended to synthesize (5-aryl/alkylamino-[1,3,4]-oxadiazol-2-yl-methyl)-(4,6-dimethyl-pyrimidin-2-yl)-amines (6b-h) (Scheme-1).



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**MW INDUCED SYNTHESIS OF SOME PYRIMIDINE LINKED
THIADIAZOLES AND STUDY OF THEIR ANTIMICROBIAL
PROPERTIES**

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ABSTRACT

The series of some interesting heterocyclic scaffolds (5-aryl/alkyl-amino-[1,3,4]-thiadiazol-2-yl-methyl)-(4,6-dimethyl-pyrimidin-2-yl)-amines (6) has been synthesized by the intramolecular cyclization of (4,6-dimethyl-pyrimidin-2-yl-amino)-acetic acid N-(N'-aryl/alkyl-thioamido)-hydrazides (5) using *o*-phosphoric acid. The required hydrazides (5) were prepared by the interaction of (4,6-dimethyl-pyrimidin-2-yl-amino)-acetic acid hydrazide (3) with differently substituted N-aryl/alkyl-isothiocyanates (4) under microwave conditions at 800 W. The hydrazide (3) was synthesized by reacting 2-amino-4,6-dimethyl-pyrimidine (1) with ethyl chloroacetate to give ethyl-(4,6-dimethyl-pyrimidin-2-yl-amino)-acetate (2) followed by its condensation with hydrazine hydrate in ethanol medium by microwave irradiation. The formation of desired compounds was checked by TLC and their structural interpretation was done by chemical transformations, elemental analysis, equivalent weight determination and spectral studies viz. IR, ¹H-NMR, mass spectroscopy. The synthesized compounds were assayed for their antimicrobial properties.

KEYWORDS: Microwave, pyrimidine linked thiadiazolidines, biological activities.

INTRODUCTION

Mostly five membered aromatic systems having three hetero-atoms at symmetrical position have been studied because of their physiological properties. Thiadiazole is a member ofazole class of heterocycle with di-unsaturated ring containing two carbons, two nitrogens and one



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SIMULTANEOUS POTENTIOMETRIC DETERMINATION OF PHARMACEUTICALLY POTENT ACECLOFENAC-PARACETAMOL COMBINATION DRUGS IN NON-AQUEOUS MEDIUM

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ABSTRACT

The simultaneous potentiometric determination of pharmaceutically potent aceclofenac-paracetamol combination drugs in non-aqueous medium using the solvent isopropanol and the titrant KOH in isopropanol has been established. The drug aceclofenac as well as the paracetamol are distinctly acidic in nature. These drug combinations are widely used in medicines and pharmaceuticals. Herein these drugs are simultaneously determined in their binary mixtures using a pair of glass and calomel electrodes by the non-aqueous differentiating potentiometric titration method. This method has been found to be precise for assay of double component combination drugs and results obtained are comparable with those obtained by Indian Pharmacopoeia (IP) method.

Keywords : *Aceclofenac-paracetamol, non-aqueous, potentiometric determination*

Introduction

The potentiometric determination in non-aqueous medium using different electrode pairs has been reported earlier¹⁻⁵. For the determination of combination drugs, different methods have been suggested and these are mostly concerns with the separation of components followed by individual component estimation using suitable technique. In the pharmacopoeias, various methods are included for the determination of combination drugs⁶⁻⁸. In literature, the estimation of combination drugs barbitone-paracetamol², salicylamide-paracetamol^{9,10}, aspirin-paracetamol¹¹ by differentiating potentiometric titrations have been reported. Determination of nimesulide-tizanidine¹², nimesulide-chlorzoxazone¹³, nimesulide-diclofenac sodium¹⁴ etc. has been reported earlier in some communications. Two component mixture of drugs aceclofenac-paracetamol¹⁵ and three component mixture of drugs aceclofenac-paracetamol-chlorzoxazone¹⁶ have been determined earlier by spectrophotometric and chromatographic techniques. Determination of aceclofenac-paracetamol combination drug by differentiating potentiometric titration method using isopropanol was not found to be reported in literature. The drugs aceclofenac and paracetamol are distinctly acidic in nature and hence could not be titrated directly with aqueous alkali owing to their hydrolysis. The

basic titrants are also superior to the alkoxide solvents which are more susceptible to the atmospheric moisture and CO₂.

Herein, the simple method for analysis of pharmaceutical drugs is reported which will help the analysis of raw materials and products for quick check of spurious drugs that are feared to penetrate the markets. In present work, potentiometric titrations in non-aqueous medium were carried out to estimate the aceclofenac and paracetamol in two component combination drugs without any separation using the solvent isopropanol and titrant KOH in isopropanol.

Material and Methods

The titrations were performed using a digital potentiometer (Equiptronics, EQ-602). Glass electrode was used as an indicator electrode whereas calomel electrode as a reference. Drugs and chemicals were weighed on Precisa-310-M (±0.001 g) balance. Chemicals and solvents used were AR grade. Solvents were purified and made anhydrous by standard methods¹⁷. Titrants were protected from atmospheric moisture and CO₂. Drugs selected for present investigation are included in pharmacopoeias⁶⁻⁸, these are pharmaceutical in nature and obtained from pharmaceutical laboratories.

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MICROWAVE ASSISTED SYNTHESIS OF PYRIMIDINE LINKED DITHIADIAZINES BY SULPHUR-SULPHUR BOND FORMATION THROUGH CYCLOCONDENSATION AND STUDY OF ANTIMICROBIAL PROPERTIES

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ABSTRACT

The microwave assisted synthesis and characterization of series of 1-(6-aryl/alkylimino-3-phenylimino-[1,2,4,5]-dithiadiazin-4-yl)-2-(4,6-dimethyl-pyrimidin-2-yl-amino)-ethanones was initiated by treating 2-amino-4,6-dimethyl-pyrimidine with ethyl chloroacetate to give ethyl (4,6-dimethyl-pyrimidin-2-yl-amino)-acetate. It on further reaction with hydrazine hydrate afforded (4,6-dimethyl-pyrimidin-2-yl-amino)-acetic acid hydrazide. The hydrazide was reacted with N-aryl/alkyl isothiocyanates and further with N-phenyl-S-chloroisothiocarbamoyl chloride and basified to afford the title compounds exhibiting differently substituted constrained pharmacophores. The purity of compounds was checked by TLC and constituents of compounds delineated by chemical transformations, IR, ¹H-NMR and mass spectral studies. Title compounds were assayed for their antimicrobial properties.

Keywords: Microwave, pyrimidine linked dithiadiazines, antimicrobial properties

Introduction

The sulphur and nitrogen containing heterocyclic compounds were found to possess a wide variety of biological activities^{1,2} and proved to be excellent versatile drugs in the field of medicinal chemistry³. Pyrimidine as a heterocyclic compound is an excellent core structure with diversified therapeutic applications⁴. Its fascinating use as a medicinally important compound is evidential from its varied biological properties⁵. Synthesis, structural details and biological study of substituted [1,2,4,5]-dithiadiazines was reported earlier in some scientific communications⁶⁻¹⁰. It was found that, N-aryl/alkyl-S-chloroisothiocarbamoyl chlorides have enough potentiality in the synthesis of nitrogen and sulphur containing 5, 6 membered heterocyclic compounds^{11,12}. It has been observed that there is scanty work on the synthesis of pyrimidine linked [1,2,4,5]-dithiadiazines.

In the present work efforts are made for microwave assisted synthesis¹³⁻¹⁴ and characterization of series of 1-(6-aryl/alkylimino-3-phenylimino-[1,2,4,5]-dithiadiazin-4-yl)-2-(4,6-dimethyl-pyrimidin-2-yl-amino)-ethanones.

Experimental

Melting points of all the synthesized compounds were determined on a digital

melting point apparatus (Veego, VMP-D) and are uncorrected. All chemicals used were of A.R. grade. The C, H and S analysis was carried out on Carlo-Erba analyser, N estimation was carried out on Colman-N-analyser-29. Purity of the title compounds were checked by TLC. All the reactions carried out in GMG20E-08-SLGX microwave oven at 800 W. IR spectra were recorded on Perkin-Elmer spectrophotometer using KBr disc. ¹H-NMR spectra were obtained on a Bruker-DRX-600 spectrophotometer in CDCl₃ with TMS as internal standard using CDCl₃ and DMSO-*d*₆ as solvents. Mass spectral measurements were carried out by EI method on a Jeol-JMC-300 spectrometer at 70 eV. The reagents used in the synthesis of 1-(6-aryl/alkylimino-3-phenylimino-[1,2,4,5]-dithiadiazin-4-yl)-2-(4,6-dimethyl-pyrimidin-2-yl-amino)-ethanones (7a-h) have been prepared as follows.

Synthesis of ethyl (4,6-dimethyl-pyrimidin-2-yl-amino)-acetate (2)

The parent compound ethyl (4,6-dimethyl-pyrimidin-2-yl-amino)-acetate (2) was prepared by irradiating the mixture of 2-amino-4,6-dimethyl-pyrimidine (1) (0.01 mol) and ethyl chloroacetate (0.01 mol) in 1,4-dioxane under microwave for 4 min 10 sec using anhydrous potassium carbonate as a catalyst⁴. When 1,4-dioxane was evaporated, crude solid mass was obtained, it was crystallised from

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**Study of Morphology and Phytochemical Screening of *Ipomoea Carnea* Jacq. of
Convolvulaceae Growing in West-Vidarbha.**

Mrs. Vaishali N. Badgujar,

Asst. Prof. Dept. of Botany, Shri R.L.T. College of
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Dr. S.P. Rothe,

Professor Dept. of Botany Shri Shivaji Science
College, Akola

In West- Vidarbha, Ipomoea carnea is a well known alien invasive species belonging to Convolvulaceae or bindweed family. It has a unique potential to survive in terrestrial as well as aquatic habitat. It has rich floristic diversity. The plant is harvested from the wild for the local use and possesses medicinal values due to presence of phytochemicals. Phytochemicals are non-nutritive plant chemicals that have protective digestive enzyme that break down glycoside bonds in chitin.

Keywords: Alien, Convolvulaceae, phytochemicals, Medicinal value.

Introduction

West Vidarbha comprises districts Akola, Amaravati, Buldhana, Washim and Yeotmal. Plants are critical to other life on this planet because they form the basis of all food webs. They have always played an important role in people's lives providing us with food, Shelter, medicine arts and a connection to the natural world plants can be used as a tool to empower and improve individuals communities and societies. In the past all the medicinal used were from the plants being man's only chemist for ages. Today a vast knowledge concerning therapeutic properties of different plants has accumulated (Kokate et al, 2005).

Phytochemicals are non nutritive plant chemicals that have protective or disease preventive properties. They are non essential nutrients meaning that they are not required by human being for sustaining life. There are more than thousand known phytochemicals. The non alkaloidal and non saponifiable fraction isolated from the leaves of *I. carnea* shows the depresser activity on Central Nervous system (Bhattacharya and Ray 1975) from the leaves of this species, agroclavin and dihydrolyserol were obtained. (Umar et. al. 1980) From latex of *Ipomoea carnea* was found a new Chinase, a digestive enzyme that break down glycoside bonds in Chitin (Patel et, al 2009; 2010) *Ipomoea carnea*, the pink morning glory is a species of family Convolvulaceae and is a unique plant which was introduced as an invasive plant from tropical America.

In India it has become a naturalised species invading the wetlands, canals, drains, banks, waste lands. The important character of the plant is that it can regenerate very fast from its part in dry as well as the moist surfaces. Due to this unique characters this plant is also from as beshram or Thetbar. Another property of the plant is that it can survive well in terrestrial surface as well as can withstand in waterlogged region or even water bodies the plant can propagate both vegetatively by stems which show rooting within a few days and sexually by seeds and has rapid growth rate (Bhalerao 1985). The hairs or trichomes are found to be very prominent which is one of the important Characteristic of the family Convolvulaceae. The present paper deals with the morphological and phytochemical screening.

Botanical Classification of (*Ipomoea carnea*) Jacq

Kingdom – Plantae

Subkingdom - Tracheophyta

Division – Spermatophyta



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PHYTOCHEMICAL INVESTIGATION AND ETHNOMEDICINAL STUDY OF WILD VEGETABLE:AMARANTHUS SPINOSUS L.**V.N. Badgujar**

Dept. of Botany, Shri R.L.T. College. of Science, Akola

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ABSTRACT

India has rich biodiversity of plants, inspite of having dry deciduous type of forest. Forest have provided tribal's with enough material from natural wealth for use as traditional food and medicine. In Maharashtra, The tribal's of Katepurana Sanctuary are Andh, Halba, Pawra, Gond, Korku etc. The diversity in the wild vegetables not only give variation in diet but also provide nutritional diversity. Wild vegetables refer to the species which are not cultivated at large scale commercially. They are grown on waste land by tribal communities or collected from their natural habitat, yields etc and used as a source of food income. Developing countries like India where food industry, malnourishment, poverty is more, potential of Wild vegetable in providing food nutrition, source of income and lively- hood in rural area plays important role. The present study concerns with the study of Ethnomedicinal and Phytochemical constituents of *Amaranthus spinosus* L. and detected saponin, carbohydrate, tannin, protein, glycoside, flavonoid and phenol as phytoconstituents.

Keywords: Ethnomedicinal, Tribal, Diversity, phytochemicals, phytoconstituents.

Introduction

Herbal medicines possess a great demand in both developed and developing countries as a source of primary health care owing to their attributes having wide biological and medicinal activities, high safety margins and lesser costs. People living in rural areas of India depend largely in the herbal medicines for the treatment.

“Wild edible plants” are wild plants with one or more parts that can be used for food if gathered at the appropriate stage of growth, and properly prepared. Wild edible plants could be weeds growing in urban areas to native plants growing in deep wilderness. Since pre-historic times, man has known to have identified the plants useful for their food from the natural stands. Man has the intelligence edge over other animals and hence is able to screen the edible and poisonous plant parts by the process of trial and error method. Wild edible plants play a major role in supplying food for poor communities mainly for tribals and rural people, since it is freely available within the natural habitats and they have knowledge on how to gather and prepare food items from these wild plant resources. Wild plants, besides from being used by poor communities, are commonly used today as supplement for healthy diets in even the most developed region of the world.

Amaranthus spinosus is an annual herb with multi branch smooth herbaceous, annual growing to 2'ft Stems and leaves are smooth and hairless sometimes shiny in appearance. Leaves ovate to rhombic-ovate, elliptic, lanceolate-oblong, or lanceolate, blades 1-12 cm long, 0.89-6 cm wide, smooth, leaf stalk 1-9 cm long. Flowers green, in axillary clusters in the lower part of the plant and in unbranched or branched spikes in the upper part, the lower clusters entirely without stamens as are the lower flowers of the spikes, the upper flowers in the spikes staminate. It belongs to family Amaranthaceae is most commonly used as wild vegetables and has enormous medicinal and Ethenomedicinal values which impart major role in nutrition. This shows the importance of plants in the health care system. Traditional use of medicine is recognized as a way to learn about potential future medicines.

Materials and Methods

In order to study diversity of *Amaranthus spinosus* and ethnomedicinal plants properties use as traditional medicine, a survey was carried out. The information on medicinal uses of indigenous people has been described after gathering information from experiences, herbal medicinal practitioners of ethnic group who are having knowledge of traditional healing. The informants belongs to Gond, Bhill, Halba,

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Tricky Situation in Maximum Power Transfer Theorem in Special Case of an Amplifier

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Abstract

The maximum power transfer theorem is a very useful tool in applied electronics and electronic engineering. It has wide range of applications in amplifier. Its concept is as follows:

When a load is connected across a voltage source or across output of an amplifier, particular amount of power is transferred to the load. The amount of power being transferred depends on the value of the load resistance (RL). Its value is always unique, for that particular source. To adjust the maximum transfer of power from source to the load, the value of the load resistance and the value of internal resistance (Ri) of the source must be equal.

Introduction

In electrical engineering, the maximum power transfer theorem states that, to obtain maximum external power from a source with a finite internal resistance, the resistance of the load must equal the resistance of the source as viewed from its output terminals.

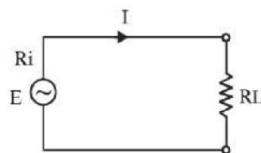


Fig:1.3 a

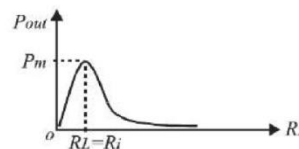


Fig:1.3 b

Suppose a voltage source (E) having internal resistance (R_i) and a load resistor (R_L) are connected in parallel, as shown in Fig: 1.3a. The current flowing through the circuit can be given as –

$$I = \frac{E}{R_L + R_i}$$

Power delivered to the load is given by –

$$P = I \cdot R_L = \left(\frac{E}{R_L + R_i} \right)^2 \cdot R_L \dots \dots (1)$$

Tricky Conditions

This theorem gives the impedance conditions in AC circuit for maximum power transfer to a load. It states that in an active AC network consisting of source with internal impedance Z_S which is connected to a load Z_L , the maximum power transfer occurs from source to load when the load impedance is equal to the complex conjugate of source impedance Z_S .

Consider the below circuit consisting of Thevenin's voltage source with series Thevenin's equivalent resistance (which are actually replacing the complex part of the circuit) connected across the complex load.

From the above figure, Let $Z_L = R_L + jX_L$ and $Z_{TH} = R_{TH} + jX_{TH}$ then the current through the circuit is given as:

$$I = \frac{V_{TH}}{Z_{TH} + Z_L}$$

By substituting for given impedance

$$I = \frac{V_{TH}}{R_{TH} + jX_{TH} + R_L + jX_L}$$

$$I = \frac{V_{TH}}{(R_L + R_{TH}) + j \cdot (X_L + X_{TH})}$$

Power delivered to the load is $P_L = I^2 \cdot R_L$



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that educational policy would enhance India's economy, scientific and technical sectors. It was widely discussed at the national and state level and in this discussion, the state of Maharashtra also showed its views.

Among the goals that were put forward in the National Education Policy, 1986 –

- To create a cultured personality of the person.
- To preserve the spiritual and moral values of person.
- Creating a scientific outlook
- Creating an attitude of diligence in expressing.
- Crating respects for secularism and nation.

Among with these different approaches, the Commission recommends education for the development of individuals. In view of the purpose of the Commission, it is seen that the person has tried to provide value education. Religious education, Character education and Moral education have used in the past. In the national policy of 1986, the term Value education is used.

Conclusion :

The article presented discusses the historical background of value education. In which Vedic Period, Buddhist Period, Medieval Period, British Period, Various Commissions and Value education etc. have been discussed.

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Autooptimize: Google Friendly Techniques To Optimize A Website With Aggregate Js, Minify Css, Cache Scripts & Styles

Yash Vidyasagar

Student, M.Sc. I Year, Fergusson College, Pune

R. D. Chaudhari

Assistant Professor, Department of Electronics,
Shri R.L.T. College of Science, Akola

ABSTRACT

The Google friendly approach to increasing the ranking of the website is currently the hottest issue being exercised on the net. The techniques of optimizing your site are of course critical. The basic need is to aggregate JS, minify the CSS (no in lining), cache scripts and styles, injects CSS in the page head by default but can also inline critical CSS and defer the aggregated full CSS, moves and defers scripts to the footer and minifies HTML. The best practices are: optimisation of images with lazy-loading, optimizing Google Fonts, asynchronising non-aggregated JavaScript, removing the CMS core emoji crust and many more. We have practically experimented on these techniques and found that the performance of the website, particularly for the search giant Google, is just great. Even when already on HTTP/2! There are many types of utilities, plugins, etc. available on the net, but the best plugin that we found is the Autooptimize. It has extensive API available to enable you to tailor to each and every site's specific needs.

INTRODUCTION

The Autooptimize plugin concatenates all

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DETERMINATION OF SUN PROTECTION FACTOR OF ECOFRIENDLY FORMULATED SUNSCREEN LOTION**P.T. Agrawal**P.G. Department of Chemistry, Shri R.L.T. College of Science, Akola, (M.S.), India
poonamagrawal2575@rediffmail.com**Abstract**

The present research demonstrate the Ecofriendly formulation of sunscreen lotion containing biologically synthesized nanoparticles in it and to compare its effectiveness with the sunscreen lotion without silver nanoparticles and other sunscreen lotion available in the market.

Key words: Silver Nanoparticles, Ecofriendly formulated sunscreen lotion. SPF Value.

Introduction

Nanotechnology is growing rapidly it has a vast application in biomedicine food and Engineering due to the small particles size of nanoparticles and greater availability of surface area. Some important characteristics of nanoparticles made its application more advantageous such as biocompatibility, high productivity and safety and its cost effectiveness¹. Silver nanoparticles show wide Varsity of application in dermatology. Moreover the sunscreen lotion prepared by chemical compounds is very costly and less effective to the high temperature. In view of this an attempt has been made to synthesized Ecofriendly sunscreen lotion containing plants extract and to these biologically² prepared silver nanoparticles was added to it to increase its effectiveness.

Experimental

UV-visible Spectra is measured using UV Spectrophotometer by using model Single Beam UV-Visible Spectrophotometer with software(BI/CI/SP/SB-S-03) of Bio Era make. Size of silver nanoparticles was calculated by using XRD.

Method and Material**Formulation of Ecofriendly sunscreen Lotion**

Sunscreen lotion is prepared by using extract of different biological material in the following proportion.

Biological Synthesis of Silver Nanoparticles from Silver Nitrate solution³

Silver nanoparticles were synthesized from silver nitrate solution. 500 gm Mushroom was first dried and mushroom extract was collected. This mushroom extract was added to the 10ml of 0.1M AgNO₃ solution. After few second the color of silver nitrate solution was change and synthesized silver Nanoparticles were separated.

Formulation mixed Ecofriendly of Silver nanoparticles silver nanoparticles

This separated AgNPs were blended with Ecofriendly sunscreen lotion. And the solution was kept for 24 Hrs.

Calculation of Sun Protection Factor^{4,5}:

Sun protection factor is calculated by the following formula

SPF = minimal erythema dose in sunscreen protected skin/ minimal erythema dose in non Sunscreen-protected skin.

Minimal erythemal dose is defined as the lowest time interval or dosage of UV light irradiation sufficient to produce a minimal, perceptible erythema on unprotected skin. The highest the SPF, the more effective is the product in preventing sunburn.

SPF (Spectrophotometry) = $CF \times \sum EE(\lambda) \times I(\lambda) \times Abs(\lambda)$

Where EE = erythermal effect spectrum, I = Solar intensity spectrum; Abs= Absorbance of sunscreen product; CF = Correction Factor=10. The value of EF X I are constant

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A FACILE SYNTHESIS AND CHARACTERIZATION OF LACTOSYLATED FORMAMIDINES NANOPARTICLES

Poonam T. Agrawal

P.G. Department of Chemistry, Shri R.L.T. College of Science, Akola-444001 (M.S.)

Abstract:

In view of application of Nanoparticles and desulfurized compounds of carbohydrates in industrial and medicinal research, we here by report the synthesized series of 1-Hepta -O-benzoyl - β -D-lactopyranosyl-3H/aryl formamidines nanoparticles and are characterized by IR, NMR and X-ray diffractions.

Index Terms: Dithiobiurets, Formamidides, Nanoparticles and characterization.

Introduction:

Desulfurization is the removal of sulfur or sulfur compounds (as from coal or flue gas), mostly from fuels. The most commonly required desulfurization process is natural gas, but it is also required for flue gas, coal and oil.

Sulfur in crude oil, natural gas, and natural gas liquids (LNG) may take many forms, including hydrogen sulfide (H₂S), carbon disulfide (CS₂), sulfur oxide

(S₂O₂) and the whole family of mercaptans. Raney nickel typically used in the reduction of compounds with multiple bonds, such as alkynes, alkenes, nitriles, olefins, aromatics and carbonyl containing compounds. Raney nickel is a spongy nickel, a fine grained solid composed of nickel derived from a nickel-aluminium alloy. Several grades are available, most are used as air-stable slurries. Raney nickel is used as a reagent and as a catalyst in organic chemistry.

Similarly In view of this application¹ of lactosyl compounds and Nanoparticles in this we have synthesis to investigate the chemistry of this new compound with reference to their application.

Nanostructure materials are attracting a great deal of attention because of their potential for achieving specific processes and selectivity, especially in biological and pharmaceutical applications^{2,3}. Recent studies have demonstrated that especially formulated nanoparticles have good antibacterial activity^{4,5}.

Experimental:

UV-visible Spectra is measured using UV Spectrophotometer by using model Single Beam UV-Visible Spectrophotometer with software(BI/CI/SP/SB-S-03)of Bio Era make.. IR spectra were recorded on Perkin-Elmer spectrum RXI FTIR spectrophotometer (4000-450 cm⁻¹). ¹H NMR was recorded in CDCl₃ on Bruker DRX-300 spectrometer operating at 300 MHz.

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Comparative Study of Antimicrobial Activity of lactosylated form amides bulk solution with its nanoparticles

Poonam T. Agrawal

P.G. Department of Chemistry, Shri R.L.T. College of Science, Akola-444001 (M.S.)

Abstract:

By observing biological application of Nanoparticles and desulphurized compounds of carbohydrates in industrial and medicinal research, it was found interesting to carry out the Antimicrobial activity of newly synthesized series of 1-Hepta-O-benzoyl- β -D-lactopyranosyl-3H/aryl formamides nanoparticles and compare it with its bulk solution.

Key words: Lactosylated Formamides, Nanoparticles and Antimicrobial activity.

Introduction:

Nanostructure materials are attracting a great deal of attention because of their potential for achieving specific processes and selectivity, especially in biological and pharmaceutical applications^{1,2}. Recent studies have demonstrated that especially formulated nanoparticles have good antibacterial activity^{3,4}.

Similarly In view of this application⁵ of lactosyl compounds and Nanoparticles in this we have synthesis to investigate the chemistry of this new compound with reference to their application.

Desulfurization is the removal of sulfur or sulfur compounds (as from coal or flue gas), mostly from fuels. The most commonly required desulfurization process is natural gas, but it is also required for flue gas, coal and oil. Sulfur in crude oil, natural gas, process gas and natural gas liquids (LNG) may take many forms, including hydrogen sulfide (H₂S), carbonyl sulfide (COS), sulfur oxide (Sox) and the whole family of mercaptans.

Experimental:

UV-visible Spectra is measured using UV Spectrophotometer by using model Single Beam UV-Visible Spectrophotometer with software (BI/CI/SP/SB-S-03) of Bio Era make.. IR spectra were recorded on Perkin-Elmer spectrum RXI FTIR spectrophotometer (4000-450 cm⁻¹). ¹H NMR was recorded in CDCl₃ on Bruker DRX-300 spectrometer operating at 300 MHz.

a) Synthesis of hepta-O-benzoyl- α -D-lactosyl bromide:

The finally powdered lactose octabenzoate (0.03M, 21.0g) was added gradually to the brominating agent. After the addition the flask was kept for 2hr at room temperature. Then the reaction mixture with chloroform (130ml) then the mixture was shaken vigorously for about 15 min. The resultant mixture was poured into ice cold water. The chloroform layer was then separated. It was washed several with aqueous sodium bicarbonate to remove excess of acetic acid followed by aqueous sodium metabisulphite to remove excess of bromine and finally 2-3 times with water. To the chloroform addition of petroleum

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A Novel Synthesis And Characterization Of Nanoparticles Of Maltosylated Formamidides**Poonam T. Agrawal**P.G. Department of Chemistry, Shri R.L.T. College of Science,
Akola-444001 (M.S.)**Abstract:**

Nanoparticles and desulphurized compounds of carbohydrates shows increasing importance in industrial and medicinal research, we here by report the synthesized series of 1-Hepta -O-benzoyl -β-D-maltopyranosyl-3H/aryl formamidides nanoparticles and are characterized by IR, NMR and X-ray diffractions.

Index Terms: Dithiobiurets, Formamidides, Nanoparticles and characterization.

Introduction:

Sulfur in crude oil, natural gas, process gas and natural gas liquids (LNG) may take many forms, including hydrogen sulfide (H₂S), carbonyl sulfide (COS), sulfur oxide (SO_x) and the whole family of mercaptans. Raney nickel typically used in the reduction of compounds with multiple bonds, such as alkynes, alkenes, nitriles, dienes, aromatics and carbonyl containing compounds. Raney nickel is a spongy nickel, is a fine grained solid composed of mostly of nickel derived from a nickel- aluminium alloy. Several grades pyrophoric, most are used as air-stable slurries. Raney nickel is used as a reagent and as a catalyst in organic chemistry.

Desulfurization is the removal of sulfur or sulfur compounds (as from coal or flue gas), mostly from fuels. The most commonly required desulfurization process is natural gas, but it is also required for flue gas, coal and oil.

Similarly In view of this application¹ of maltosyl compounds and Nanoparticles in this we have synthesis to investigate the chemistry of this new compound with reference to their application.

Nanostructure materials are attracting a great deal of attention because of their potential for achieving specific processes and selectivity, especially in biological and pharmaceutical applications^{2,3}. Recent studies have demonstrated that especially formulated nanoparticles have good antibacterial activity^{4,5}.

Experimental:

UV-visible Spectra is measured using UV Spectrophotometer by using model Single Beam UV-Visible Spectrophotometer with software (BI/CI/SP/SB-S-03) of Bio Era make. IR spectra were recorded on Perkin-Elmer spectrum RXI FTIR spectrophotometer (4000-450 cm⁻¹). ¹H NMR was recorded in CDCl₃ on Bruker DRX-300 spectrometer operating at 300 MHz.

a) Synthesis of hepta-O-benzoyl-α-D-maltosyl bromide:

The finally powdered maltose octabenzate (0.03M, 21.0g) was added gradually to the brominating agent. After the addition the flask was kept for 2hr at room temperature. Then the reaction mixture with chloroform (130ml) then the mixture was shaken vigorously for about 15 min. The resultant mixture was poured into ice cold water. The chloroform layer was then separated. It was washed several with aqueous sodium bicarbonate to remove excess of acetic acid followed by aqueous sodium metabisulphite to remove excess of bromine and finally 2-3 times with water. To the chloroform addition of petroleum ether afforded a solid (16.5 gm). This solid was expected hepta-O-benzoyl-α-D-maltosyl bromide (yield 77%). It was purified by dissolving it in minimum quantity of chloroform and reprecipitating it with petroleum ether, m.p. 168^oC.

b) Preparation of lead thiocyanate :

Lead thiocyanate was prepared by mixing aqueous solution of lead nitrate and ammonium thiocyanate. The white granular lead thiocyanate was filtered washed with distilled water and dried at 50^o C.

c) Preparation of hepta-O-benzoyl-β-D-maltosyl isothiocyanate⁶ :

To a suspension of hepta-O-benzoyl-α-D-maltosyl bromide (21 gm, 0.03M) in sodium dried xylene (80ml) was added lead thiocyanate (6gm, 0.03M). The reaction mixture was then treated for microwave synthesis for about 3 min. This solution was then cooled and liberated lead bromide was removed by



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Innovative Research in Library Field

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Abstract
The process of translating an idea or invention into a good or service that creates value or for which customers will pay is called an innovation; an idea must be applicable at an economical cost and must satisfy a specific need. It involves deliberate application of information, imagination and initiative in deriving greater or different values from resources, and includes all processes by which new ideas are generated and converted into useful products. In libraries, innovation often results when ideas are applied by the Librarian in order to further satisfy the needs and expectations of the users.

Introduction
Despite representing more than 80% of occupation and more than half of user expenditures in the SAARC countries services have received little attention from the innovation community within professional institutes. While management specialists continue involved in innovation, much of their focus has been upon library services. Some management intellectuals have described services innovations as determination of users' needs and how effectively and efficiently their needs can be fulfilled in different innovative tools by the service provider. The subject, Service Innovation represents a major gap in the innovation literature, a gap which this paper addresses. Service Innovation in library services can improve the effectiveness of library knowledge management which ultimately helps not only to the students but also to the faculties, research scholars of various institutions as well.
"Service Innovation may be defined as

the use and improvement of various technologies to provide better and services to the users within a reasonable for the development of the users as well a society as a whole." In today's world, a system is not a job where only one person is appointed to handle all the activities of library but it has become a job with a variety of activities handled by many professionals Librarian, Librarian Administrator, Content Developer, Content Designer, Content Manager, Web Site operator, Data Entry operators etc. provide effective and efficient services to interested people. Libraries also require service innovations so that it can fulfil the needs of users. To understand the nuanced distinction between the physical services provided by library and the library services by Web 2.0, necessary to explain these two terms in detail for a better understanding to the readers.

Library Innovations:

- Innovation is a complex process creation, distribution and usage of novelties
- Innovation is a complex process creation, distribution and usage of novelties

Order to enable library development as a social institute and enhancement of library Performance

- Library innovation is a system of new ideas proposed by creatively thinking professionals or by a team

Current technology trends in libraries
Previously we've looked at future technologies in libraries. This week guest writer John Garland, digital librarian and independent consultant, helps us look at how libraries are using technology to improve services for customers today. Innovative libraries are using digital tools to:

- Library innovation is a system of new ideas proposed by creatively thinking professionals or by a team

Innovation is a complex process creation, distribution and usage of novelties in order to enable library development as a social institute and enhancement of library Performance

Library innovation is a system of new ideas proposed by creatively

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Innovations in Library Automation and Information Science

Miss Priyanka S. Jaiswal,

Research Scholars, Shri R.L.T College Of Science,
Akola

Mangesh Ubale.

Librarian, Shri R.L.T College Of Science, Akola

Abstracts:

The main purpose of this study is to assess self-estimated overall Information science and library automation. These same disruptive forces are acting on the academic library. Although many have called for a transformation in the library, there is a relatively minimal amount of discussion regarding what the transformation entails. Library automation, Information science is reference, articles, Journals, etc. It is also refers to use of computer to keep tracks of all the books that are added, issue, returned in library. Library automation is the part of management system in information technology era. This system ensure to handling proper book in library by the process of library automation.

Information Science is related to all discipline in knowledge branch. Such as social science, pure science. It is mostly related to library science. Library science is likely to information science. Information is useable. When is use or process, New information is generate by it. Information is generating in data, information, and knowledge. Information Science means processing of information. Library and Information science works like this. In this paper state that innovation of Library automation and information science in all discipline.

Introduction:

Library automation will play a vital role in library management system. Library automation stated in single term is the application of computers and services in the performance of different library operations and function. Technological advance and market demands required the vendors of library automation system to develop new generation of powerful integrated system. There is no need to an annual maintains to open source Library automation software. Libraries, which have completed their RECON projects can transfer their large bibliographic database to the new integrated system and Library automation all their operations. Library users education is need to use the library automation database effectively.

Library automation is a part of management system that is library automation facilities to better utilization library collection, library services, libraries technology work and all possible work in library housekeeping operation. Library automation is a technology that reducing manual execration, duplication of all possible works in library. Library automation concept use in library for right reader, right place, right time, give appropriate information. In this reason this concept came in library science sector. Library automation is a single term that collaborate all work by machine.

It is important to know Library automation concept that widely use in libraries and it is critical and expensive process so if we want to apply it and information Science is related to library Science. Therefore, it is important to know deeply.

Definition

Information Sciences: Information science is an interrelated science that deals with the properties and behaviour of information and control the for and use of information for processing, storage, management and other subject.

Library Automation : Library automation is the application of automatic and semiautomatic date processing machines to performs traditional library house keeping actives such as acquisition, circulation, cataloguing and reference and serials control.

Information Science and Library automation

Information Science concept use in all subject fields. It is related to handling of information, use utilization and processing of information. library automation is on part of in this processes. Information Science could have faster, accuracy to come automation facility. So Automation is a technique which is use in information Science to better utilization information processing and information services. Library and



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Ranganathan's Five Laws and its Impact to the Technological Innovations of Library and Information Sciences

Mangesh Ramesh Ubale
Shri RLT College of Science, Akola

Abstract

This paper analytically reviews the five basement laws appear in the field of Library and Information Science (LIS) that, introduced by Dr. S.R. Ranganathan, who was the first class Indian library scientist, and his laws theoretical impacts to the technological enhancements of the field of Library and Information Science (LIS). Technology transitions from conventional age to Digital age, and individual impacts on element of Ranganathan's laws for that were analytically revived throughout the available literature. Finally, concluded that, most of the technological innovations available at the field of Library and Information Science (LIs). Have based Ranganathan's five laws, and his five laws are still on live of the library and information science domain.

1. Introduction

1.1 Recent Developments of LIS Public Domain

In 1900s, the libraries were began to more popular among general public, after liberzed them from royal prerogatives, who ruled world before 1900s and transferred the management of the libraries into the progressive philosophers called librarians

During this renaissance period, many researches and developments taken place toward information organizing and distributing, formulating standards for librarianship and form a better library management system. These were devilishly affected to the revolutionary development in the field of Library and Information science.

In 1960s dada communication via cables (World Wide Web &Internet) was implemented and it affected to the massive change at the telecommunication industry. Information could be able to send one place to another very fast as packet data, and this technology gradually impacted to the field of LIS to store information and send to another party very quickly on requests.

Present era called as "Information era" Therefore, information is considered as an important tool in every aspect of human life and very recently it has become the fifth need of human life. Today people are searching information from mobile devices which have connected to the super speed 4G internet. The shapes of the libraries also have become an invisible mode (virtual library). Many cloud based information clusters are waiting until users are requested information. Finally information has become a most important need of the human life.

1.1.1 What is Technological Innovations?

Technological innovations comprise new products and processes and significant technological changes of products and processes. There is no doubt that technology has had a lasting impact on libraries. Once thought to be going the way of traditional bookstores, libraries have rebounded and are thriving in a technology fuelled world. With the help of innovation, re-imagination and vision, libraries are embracing new technologies while creating dynamic community centres filled with life

1.1.2 S.R. Ranganathan & Five Laws of LIS

Dr. Shiyali Ramamrita Ranganathan considered the father of library science in India cover certain facets of library and information science. He was a university librarian and professor of library science at Benares Hindu University (1945–47) and professor of library science at the University of Delhi (1947– 55). The last appointment made him director of the first Indian school of librarianship to offer higher degrees. He was president of the Indian Library Association from 1944 to 1953. In 1957 he was elected an honorary member of the International Federation for Information and Documentation (FID) and was made a vice-president for life of the Library Association of Great Britain. As well as he was the author of many LIS text books and founder of Colon Classification system [9]. In 1931, he introduced the five laws to LIS, and most of the contemporaries were accepted those laws as the basic fundamentals of the library management system. These laws are as



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On Equinormal Proximity Space and Uniformly Continuous Uniform Space

Dr. S. B. Tadam & Dr. S. M. Padhye
Department of Mathematics, Shri R.L.T. College of Science, Akola.

Abstract: In this paper we obtain the characterization of uniformly continuous pseudo metric spaces in terms of the associated equinormal proximity spaces. The precise result is the following.

If (X, d) is a pseudo metric space and $\delta = \delta(d)$ is the associated proximity on X , then (X, d) is uniformly continuous if and only if (X, δ) is equinormal proximity space.

We also characterize equinormality of proximity space associated with normal uniform space in terms of proximity of continuous mapping. Precisely the following is proved.

If (X, \mathcal{U}) is a normal uniform space and δ is the associated proximity on X then (X, δ) is equinormal proximity space iff every continuous real valued function on X is a proximity mapping. Here the proximity δ_1 on \mathbb{R} is defined as $A\delta_1 B \Leftrightarrow d(A, B) = \inf\{|x - y| : x \in A, y \in B\} = 0$.

Also we obtain the sufficient conditions for a uniform space to define equinormal proximity. The precise results are as follows.

Let (X, \mathcal{U}) be a uniform space and δ be the associated proximity on X . If for any two non empty disjoint closed sets at least one is compact, then (X, δ) is equinormal.

For a normal uniform space (X, \mathcal{U}) and the associated proximity δ , if (X, \mathcal{U}) is uniformly continuous space then (X, δ) is equinormal.

Key words: Uniformly continuous space, Proximity space, Equinormal Proximity space and Proximity mapping.

1. Characterization of uniformly continuous pseudo metric spaces in terms in terms of proximity :

Definition 1.1:

Equinormal proximity space: A proximity space (X, δ) is equinormal iff $A\delta B \Leftrightarrow \bar{A} \cap \bar{B} \neq \emptyset$.

Theorem 1.2:

Suppose (X, d) is a pseudo metric space. Then (X, d) is uniformly continuous space if and only if $\bar{A} \cap \bar{B} = \emptyset \Leftrightarrow d(A, B) > 0$.

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Qualitative Phytochemical analysis and Pharmacological Studies of *Salvia officinalis* (Linn.)

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ABSTRACT

The use of plants as medicine is as old as human civilization. People of all ages in both developing and developed countries use plants in an attempt to care various diseases and to get relief from physical sufferings. Natural products are a source for a bioactive compounds and have potential for developing some novel therapeutic agents. Hence in the present study pharmacological activity, traditional benefits and phytochemical analysis of *Salvia officinalis* (Linn.) confirms the presence of various phytochemicals like saponin, terpenoids, sterioids, flavonoids, tannins, quinones and alkaloids. The result suggests that, this plant have a great potential for curing various ailments and can be source of useful drugs.

Keywords: *Salvia officinalis*, phytochemical screening, pharmacological activities, traditional uses.

INTRODUCTION

Medicinal plants have been used from centuries as remedy for human diseases because they contain the compounds of therapeutic values. The plant kingdom has proven to be the most useful in the treatment of various diseases and they have provides an important source of all the words pharmaceuticals. The most important bioactive constituents of plants are steroids, terpenoids, carotenoids, flavonoids, alkaloids, tannins and glycosides. Plants in a facet of life have served a valuable starting material for drug development. (Singh et. al. 2003). *Salvia officinalis* (Linn.) (Lamiaceae) commonly known as Sage. This plant has been recognized world wide as a multipurpose plant. It is, evergreen subshrub, with woody stems, grayish leaves and blue to purplish throughout the world, it has long history of medicinal and culinary uses and in modern times as an ornamental garden plant. The common name Sage is also used for a number of related and unrelated species. Sutton (2004).

MATERIAL AND METHODS

The plant material were collected from the Akola region and identified taxonomically by using standard floras (Cook 1967, Kambale and Pradhan, 1988, Naik, 1998). The fresh leaves of the plants *Salvia officinalis* (Linn.) were

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Preliminary Phytochemical Analysis And Pharmacological Studies of *Gloriosa superba* (L.)

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Assistant Professor, Department of Botany,
Shri R.L.T. College of Science, Akola, India

Abstract :-

The use of plants as medicine is as old as human civilization. People of all ages in both developing and developed countries use plants in an attempt to care various diseases and to get relief from physical sufferings. Natural products are a source for a bioactive compound and have potential for developing some novel therapeutic agents. Hence in the present study pharmacological activity, traditional benefits and phytochemical analysis of *Gloriosa superba* (L.) confirms the presence of various phytochemicals like saponin, terpenoids, steroids, flavonoids, tannins, quinones and alkaloids. The result suggests that, this plant have a great potential for curing various ailments and can be source of useful drugs.

Key Words : *Gloriosa superba* (L), phytochemical screening, pharmacological activities, traditional uses.

Introduction :-

Medicinal plants have been used from centuries as remedy for human diseases because they contain the compounds of therapeutic values. The plant kingdom has proven to be the most useful in the treatment of various diseases and they have provides an important source of all the words pharmaceuticals. The most important bioactive constituents of plants are steroids, terpenoids, carotenoids, flavonoids, alkaloids, tannins and glycosides. Plants in a facet of life have served a valuable starting material for drug development. (Singh V.K. et. al. 2003). *Gloriosa superba* (L), (Colchicaceae) commonly known as flame lily. This plant grows in many types of habitat, including tropical jungles forest thickets, woodlands, grasslands and sand dunes. The species is perennial herb growing from a fleshy rhizome. The showy flowers has six tepals each up to 5 to 7.6centimeters long they are generally bright red to orange at maturity sometimes yellowish bases m It is, evergreen subshrub, with woody stems, grayish leaves and blue to purplish throughout the the quite wavy. (Thorp 1998).

Material and Methods :

The plant material were collected from the Akola region and identified taxonomically by using standard floras (Cook 1967, Kathikeyan, Kambale & Pradhan, Naik). The seeds of the plant *Gloriosa superba* (L), were air dried under the shade. The dried seeds of the plant are crushed to obtain powder. These powdered samples are then stored in air tight polythene bags protected from sunlight until used. The organic solvent like petroleum ether, alcohol, chloroform, acetone, benzene & aqueous extracts of each sample was prepared by soaking as 1 : 10 ratio that is 3 gm of powder sample in 30 ml of organic solvents and distilled water for 18 hr. The extracts are then filtered using whatman filter paper, and used for phytochemical study.

Phytochemical Screening :

Chemical test were carried out on the organic solvents & aqueous extract and on the powdered specimens using standard procedure to identified the constituents as described by Harborne (1973), Edeoga et. al. (2005) and Krishnaiah et. al. (2009).

Test for Alkaloids :

To the 2-3 ml of filtrate, 1 ml of dil HCL and 1 lager's reagent was added and shake well. Yellow precipitate was formed showing the presence of alkaloids.

Test for Flavonoids :

To the small quantity of extract lead acetate solution was added. Formation of yellow precipitate showed the presence of flavonoids.

Test for Steroids :

To 2 ml of extract of chloroform & 2 ml of conc. H₂SO₄ was added. The solution was shaken well. As a result, chloroform layer turned red and acid layer showed greenish yellow fluorescence.

Test for Tannin :

On addition of 5% FeCl₃ solution to the extract deep blue black colour appeared.

Test for Saponin :

To 1 ml extract 20 ml distilled water has added and shake well in measuring cylinder. Then 1 cm layer of foam was formed.



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KIDNEY STONE TREATMENT MEDICINAL PLANT & THEIR PHYTOCHEMICAL STUDY

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ABSTRACT

Plants have been used traditionally in local people for treatment of kidney stone. The plant root extract identified eg serve as major source of active ingredients and products of secondary metabolites eg. Alkaloids and phenolics etc used in curing disease. The phytochemical study of *Abutilon indicum* (L.) was evaluated to ascertain some of the secondary metabolites that exhibit medicinal properties. The results of phytochemical screening of ethanol crude root extract of *Abutilon indicum* (L.) revealed the presence of alkaloid, tannins, saponins and flavonoids. These metabolites observed by various technique like solvent extraction ultrasonicator, rotavapour, thin layer chromatography column separation and HPTLC technique. Plants as medicine is as old as human civilization. People of all ages in both developing and developed countries use plants in an attempt to care various diseases and to get relief from physical sufferings. Natural products are a source for a bioactive compounds and have potential for developing some novel therapeutic agents.

Keywords : secondary metabolites, kidney stone, rotavapour, phytochemical screening, traditional uses.

1) Introduction

Medicinal plants have been used from centuries as remedy for human diseases because they contain the compounds of therapeutic values. The most important bioactive constituents of plants are steroids, terpenoids, carotenoids, flavonoids, alkaloids, tannins and glycosides. Plants in a facet of life have served a valuable starting material for drug development. (Singh V.K. et. al. 2003). *Abutilon indicum* (L.) is a small shrub in the family Malvaceae, native to tropic and subtropical regions and sometime cultivated as an ornamental. It is found in Katepurna forest Dist-Akola. This plant is often used as a medicinal plant and its roots extract used against kidney stone (Matlwaska 2002). In traditional medicine, *A. indicum* various parts of the plant are used as a demulcent, aphrodisiacs, leprosy, ulcers, headaches, gonorrhoea and bladder infection. The root extract is wonderful drugs against the kidney stone (Nishanta2002). The plant is very much used in Siddha medicine. The roots, bark, flowers, leaves and seeds are all used for medicinal purposes by tribals. The flowers are used to increase semen in men (Ramachandran). The present study is to review the overall information on the taxonomical classification, morphology, distribution, traditional uses, phytochemical

constituents and recent scientific investigation of *Abutilon indicum* (L.)

2) Material and Methods

2.1) Plant material : The plant material were collected from the Katepurna forest Dist. Akola region and identified taxonomically by using standard floras. (Cook 1967, Kathikeyan, Kambale & Pradhan, Naik). The fresh leaves of the plants *Abutilon indicum* (L.) were air dried under the shade. The dried leaves of the plant are crushed to obtain powder.

2.2) Preparation of extracts : These powdered samples are then stored in air tight polythene bags protected from sunlight until used. Ethanol extract keep in ultrasonicator for half an hour to mix all chemical constituents in ethanol solvent was subjected to successive extraction in a soxhlet extractor using ethanol and water. The extract were filtered and concentrated under rota vapour at room temperature to obtain extract as solid residues.

2.3) Primary Phytochemical Screening : Chemical test were carried out on the organic solvents & aqueous extract and on the powdered specimens using standard procedure, to identified the constituents as described by Harborne (1973), Edeoga et. al. (2005) and Krishnaiah et. al. (2009).

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ONE STEP SYNTHESIS OF ARYL-ACRIDINES USING AROMATIC ACID

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³Department of Chemistry, HPT and RYK Science College, Nashik.

Abstract : One step preparation of aryl-acridines has been reported using barium chloride as a catalyst under microwave condition. The cyclization reaction involving mixture of diphenyl amine and aromatic acid under solvent free condition using barium chloride as a catalyst leads to formation of 9-aryl-acridine. Formation of title compounds was checked by TLC and confirmed by IR, ¹H-NMR Mass spectrometry.

Keywords : Barium chloride, microwave method, acridines.

I. INTRODUCTION

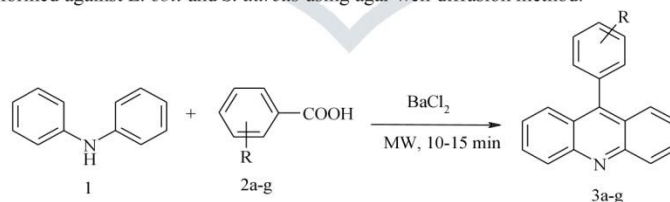
Barium chloride is an ionic water-soluble salt mostly used inexpensive, commercially available catalysts that can be easily separated and reused[1]. The use of barium dichloride as a Lewis acid catalyst in the synthesis of substituted coumarins via Pechmann cyclocondensation proved the catalytic efficiency under thermal and solvent-free conditions[2]. The extensive investigation was done by exploring one pot Biginelli reaction using barium chloride under different solvents. The high yield, mild and solvent-free reaction conditions explains the synthetic utility in accord with green chemistry criteria[3].

Microwave technique for one-pot cyclocondensation provides a number of advantages in synthesis of a series of novel five and six member ring containing nitrogen and in cyclization 1,3 dicarbonyl compounds with compound of nucleophilic character at atmospheric pressure in open vessel[4]. High density microwave irradiation has matured into a reliable and useful methodology for accelerating time consuming reactions[5]. Acridine is widely exploited pharmacophore in synthetic chemistry having practical application in the medicinal sciences. From the extensive literature survey it has been found that acridine and their derivatives exhibit anti-inflammatory, anti-tumour, antimalarial and anticancer activities[6-8]. The use of acridine nucleus as a vector leads to numerous clinical trials for DNA-targeting drugs studies is well known application and studies on acridine derivatives have been published recently, focusing on their therapeutics properties against cancer, parasites and bacteria[9-11].

Keeping in view of biological significance, Here-in we report an efficient MW synthesis of 9-aryl-acridines using BaCl₂ as a catalyst under microwave condition.

II. EXPERIMENTAL

Melting points were determined on a digital melting point apparatus (Veego, VMP-D) and are uncorrected. All chemicals used were of AR grade. All MW irradiation experiments were carried out in synthetic microwave oven with continuous irradiation of power 120W. Purity of title compounds checked by TLC till single spot is observed. The IR spectra were recorded on Agilent Cary 630 FTIR spectrophotometer using KBr disc. ¹H-NMR spectra were obtained on a Bruker-Avance-600 MHz spectrophotometer in CDCl₃ using tetramethyl silane as internal standard. Mass spectral measurements were carried out by EI method on a Jeol, JMC-300 spectrometer at 70 eV. Antimicrobial screening of title compounds was performed against *E. coli* and *S. aureus* using agar well diffusion method.



Scheme 1: 9- Substituted-aryl-acridines, 3a-g

9-phenyl-acridines, 3a

9-phenyl-acridine (3a) was prepared by irradiating the mixture of diphenyl amine and benzoic acid using BaCl₂ as a catalyst under microwave condition for 10-15 min., progress of reactions monitored by TLC, crude solid was recrystallized from absolute alcohol in cold condition and identified as 9-phenyl-acridine (3a).

Similarly 9-aryl-acridines (3b-g) were prepared by irradiating the mixture of diphenyl amine (1) and various aromatic acid (2b-g) using BaCl₂ as a catalyst under microwave condition.

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COMPARATIVE STUDY OF SYNTHESIS OF 9-ARYL-ACRIDINES USING IODINE AS CATALYST**P. Kawle**P.G.Department of Chemistry, Shri RLT College of Science, Akola444 001, Maharashtra, India
pravink280685@rediffmail.com**ABSTRACT**

A series of 9-substituted aryl-acridines have been synthesized by interaction of diphenyl amine and various aromatic acids/ aldehydes using iodine as a recyclable catalyst under microwave condition and evaluated for antimicrobial activity. The formation of title compounds were confirmed by TLC till to get single spot on silica plate and characterised by IR, ¹H-NMR and Mass spectrometry. All the compounds were screened for their antimicrobial activity against selected microorganisms *E. coli* and *S. aureus*.

Keywords: Microwave heating method, iodine, acridines.

Introduction

Microwave technique for one-pot cyclocondensations provides a number of advantages in synthesis of a series of novel five and six member ring containing nitrogen and in cyclization 1,3 dicarbonyl compounds with compound of nucleophilic character at atmospheric pressure in open vessel (Lindstrom et al., 2001). High density microwave irradiation has matured into a reliable and useful methodology for accelerating time consuming reactions (Gronnow et al., 2005). Numerous advantages of iodine as a catalyst have proved its effectiveness in synthetic chemistry under different methodology such as classical heating, microwave heating, ultrasonic induced or simple mechanochemical stirring method (Samajdaret al., 2001). The transformation of functional group from one to other using iodine as a catalyst has attracted attention of chemists since economical, efficient and ecofriendly alternative to transition metal Ni, Pd, etc in organic synthesis (Renet al., 2013). The protection and deprotection of aldehyde and ketone via acetals, ketals can also be performed successfully with molecular iodine as a catalyst in acetone (Banik, 2014).

Acridine is widely exploited moiety in synthetic chemistry having practical application in the pharmaceutical sciences. From the extensive literature survey it has been found that acridines exhibit anti-tumour (Srivastava et al., 2004), anti-inflammatory (Elslager et al., 1969), antimalarial and anticancer activities (Mayer et

al., 1963). The acridine nucleus utilised as a vector leads to numerous clinical trials for DNA-targeting drugs studies is well known application. Research studies on acridine derivatives have been published recently, focusing on their therapeutics properties against cancer (Antonini, 2004), parasites (Denny, 2004) and bacteria (Kelland, 2005). Keeping in view of biological significance, here-in we report a 9-substituted aryl-acridines have been synthesized using iodine as a recyclable catalyst under microwave condition and evaluated for antimicrobial activity against selected microorganisms.

Materials and Methods

Melting points were determined on a Thiels apparatus and are uncorrected. All chemicals used were of AR grade and purchased from Sigma Aldrich. Purity of title compounds checked by TLC till single spot is observed employing petroleum ether and ethyl acetate (2:3) as eluent. The IR spectra (4000-400 cm⁻¹) were recorded on Agilent Cary 630 FTIR spectrophotometer using KBr disc. The ¹H-NMR spectra were obtained on a Bruker, Avance-600 MHz spectrophotometer in CDCl₃ as a solvent using tetramethylsilane (TMS) as an internal standard. Mass spectral measurements were carried out by EI method on Jeol, JMC-300 spectrometer at 70 eV. Antimicrobial screening of title compounds was performed against *E. coli* and *S. aureus* using agar well diffusion

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Barium Chloride Catalysed Synthesis Of Acridine/Tetrahydro Acridine Derivatives Under Microwave Heating

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Abstract

Single step syntheses of acridine derivatives have been reported under microwave heating at room temperature. The oxidative cyclization of diphenyl amine and aromatic ketone/ aromatic acid under solvent free condition leads to formation of 9-aryl-acridine using barium chloride as a catalyst. The title compounds were characterised by IR, ¹H-NMR and Mass spectrometry.

Keywords: Barium chloride, microwave method, acridines.

Introduction

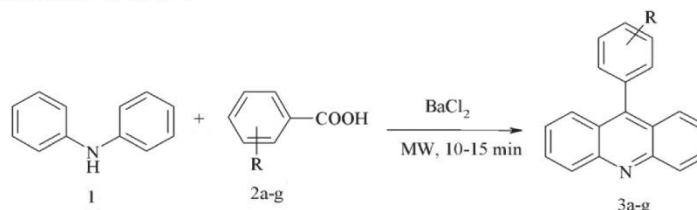
Barium chloride is an ionic water-soluble salt mostly used inexpensive, commercially available catalysts that can be easily separated and reused[1]. The use of barium dichloride as a Lewis acid catalyst in the synthesis of substituted coumarins via Pechmann-cyclocondensation proved the catalytic efficiency under thermal and solvent-free conditions[2]. The extensive investigation was done by exploring one pot Biginelli reaction using barium chloride under different solvents. The high yield, mild and solvent-free reaction conditions explains the synthetic utility in accord with green chemistry criteria[3].

Microwave technique for one-pot cyclocondensation provides a number of advantages in synthesis of a series of novel five and six member ring containing nitrogen and in cyclization 1,3 dicarbonyl compounds with compound of nucleophilic character at atmospheric pressure in open vessel[4]. High density microwave irradiation has matured into a reliable and useful methodology for accelerating time consuming reactions[5]. Acridine is widely exploited pharmacophore in synthetic chemistry having practical application in the medicinal sciences. From the extensive literature survey it has been found that acridine and their derivatives exhibit anti-inflammatory, anti-tumour, antimalarial and anticancer activities[6-8]. The use of acridine nucleus as a vector leads to numerous clinical trials for DNA-targeting drugs studies is well known application and studies on acridine derivatives have been published recently, focusing on their therapeutics properties against cancer, parasites and bacteria[9-11].

Keeping in view of biological significance, Here-in we report an efficient MW synthesis of 9-aryl-acridines and 9-alkyl/aryl-9-aryl-tetra hydro-acridines using BaCl₂ as a catalyst under microwave condition.

Material And Method

All MW irradiation experiments were carried out in synthetic microwave oven with continuous irradiation of power 120W. Purity of title compounds checked by TLC till single spot is observed. Melting points were determined on a digital melting point apparatus (Veego, VMP-D) and are uncorrected. All chemicals used were of AR grade. The IR spectra were recorded on Agilent Cary 630 FTIR spectrophotometer using KBr disc. ¹H-NMR spectra were obtained on a Bruker-Avance-600 MHz spectrophotometer in CDCl₃ using tetramethyl silane as internal standard. Mass spectral measurements were carried out by EI method on a Jeol, JMC-300 spectrometer at 70 eV.



Scheme 1: 9-Substituted-aryl-acridines, 3a-g



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**Effect Of Folic Acid Antagonist Methotrexate (MTX) on Testis of
Funambulus Pennanti (Wroughton)**

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Shri R.L.T. College of Science, Akola, Maharashtra, India.

Abstract

Methotrexate (MTX) is an effective agent in treatment of cancer, is one of the most versatile antineoplastic agents in spite of severe toxicity problems. The toxic effect of the Methotrexate on testis have been studied by intramuscularly injection of low dose of 3 mg/kg BW/per day and 6 mg/kg BW/day for 15 days to adult male squirrel (Funambulus pennanti) during breeding period. For comparing the effects the saline treated vehicle was injected same amount of saline and was maintained for the same duration. Toxic effect of MTX on the testis was their smallness in size sometimes irregularity in general contour, noticeable thickness of tunica albuginea, irregular appearance of spermatid arteries supplying blood to testis, in both the doses. Since MTX crosses the blood testis barrier, it induces significant reduction in the size of the tubules. From the foregoing it is concluded that Methotrexate has antigonadotrophic, antiandrogenic and antispermatogenic properties which are dose and duration dependent besides being toxic, therefore certainly causing reduction in the fertility rate.

Key words: Methotrexate, toxicity, antifertility

Introduction

Methotrexate is structurally related to dihydrofolate (the natural substrate for dihydrofolate reductase) that catalyzes the reduction of dihydrofolate to tetrahydrofolate and is a potent inhibitor of dihydrofolate reductase (DHFR). The inhibition of DHFR leads to an accumulation of dihydrofolate which is unable to act as substrate for any of the reaction converting tetrahydrofolate to its cofactor derivatives and, therefore, its accumulation is associated with depletion of the pool of the reduced folate cofactors. Methotrexate (Rheumatrex) is a medicine that is used to treat Rheumatoid arthritis (RA), psoriatic arthritis, Reiter's syndrome and other conditions. Aside from its antineoplastic activity, Methotrexate has also been used with benefit in the therapy of common skin disease psoriasis (McDonald, 1981). Additionally Methotrexate inhibits cell mediated immune reaction and is employed as an immunosuppressive agent, for example, in allogenic bone marrow and organ transplantation and for the treatment of dermatomyositis, rheumatoid arthritis, Wegener granulomatosis and Crohn's disease (Messmann and Allegra, 2001; Feagan *et al.*, 1995). Methotrexate was formerly known as amethopterin, is an antimetabolite drug used in treatment of cancer and autoimmune diseases.

Material and Method

In all three sets of experiments using low and high-doses of Methotrexate (MTX) were performed for the present study for the duration of 15 days (Tables 1 & 2).

Animals were sacrificed using chloroform 24 hours after the last day of each experiment. Immediately the testis was excised and used for histological studies.

Table 1: Experimental Design for Low Dose Methotrexate treatment

Number of animals and sex	Treatment	Dose mg/kg BW	Route	Duration
3 males (Experimental)	Methotrexate	3 mg daily	I.M.	15 days
3 males (Control)	Saline	E.V.	I.M.	15 days

Table 2: Experimental Design for High Dose Methotrexate treatment

Number of animals and sex	Treatment	Dose mg/kg BW	Route	Duration
3 males (Experimental)	Methotrexate	6 mg daily	I.M.	15 days
3 males (Control)	Saline	E.V.	I.M.	15 days

Abbreviations: E. V. = Equal volume, I. M. = Intra muscular, B W = Body weight

Observation and Results



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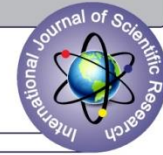
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EFFECT OF FOLLIC ACID ANTAGONIST METHOTREXATE (MTX) ON THE LEVEL OF TESTOSTERONE OF *FUNAMBULUS PENNANTI* (WROUGHTON)

Biological Science

S. R. Kohchale

Asst. Professor, Department of Zoology, Shri R.L.T. College of Science, Akola, Maharashtra, India.

ABSTRACT

Effect of Methotrexate on the level of testosterone have been studied by intramuscularly injecting low dose of 3 mg/kg BW/ per day and 6 mg/kg BW/ day for 15 days to adult male squirrel (*Funambulus pennanti*) during the breeding period January. For comparing the effects saline treated vehicle was injected same amount of saline and were maintained for the same duration. Level of testosterone was determined by Enzyme Linked Fluorescent Assay (ELFA), significant decrease in the testosterone level after high dose treatment and insignificant decrease after low dose treatment observed. From the foregoing it is concluded that Methotrexate has adverse effect on spermatogenesis which are dose and duration dependent besides being toxic, therefore certainly causing reduction in the fertility rate.

KEYWORDS

Methotrexate, Testosterone, ELFA, Antifertility

INTRODUCTION

Methotrexate (Rheumatrex) is a medicine that is used to treat Rheumatoid arthritis (RA), psoriatic arthritis, Reiter's syndrome and other conditions. Aside from its antineoplastic activity, Methotrexate has also been used with benefit in the therapy of common skin disease psoriasis (McDonald, 1981). Additionally Methotrexate inhibits cell mediated immune reaction and is employed as an immunosuppressive agent, for example, in allogenic bone marrow and organ transplantation and for the treatment of dermatomyositis, rheumatoid arthritis, Wegener granulomatosis and Crohn's disease (Messmann and Allegra, 2001; Feagan *et al.*, 1995). Methotrexate was formerly known as amethopterin, is an antimetabolite drug used in treatment of cancer and autoimmune diseases.

MATERIAL AND METHODS

Enzyme Linked Fluorescent Assay (ELFA) For The Measurement Of Serum Testosterone

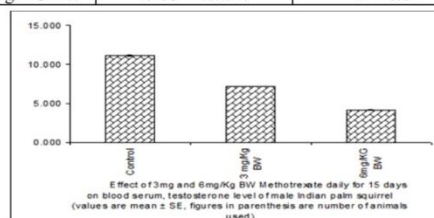
For the determination of testosterone level in blood, squirrels were anesthetized by ether and 2ml of blood was drawn by cardiac puncture with 2ml sterile syringe. The blood was allowed to clot at room temperature for half an hour. The clotted blood was sent to NRPL Pathology laboratory, Nagpur for further processing (Delahunt, 1993).

Observation and results

The low dose group showed insignificant decrease but the high dose treatment resulted into significant decrease in Testosterone concentration compared to control values (Table-1 and fig. 1 bar diagram).

Table and Graph : 1. Effect of 3mg and 6mg/Kg BW Methotrexate daily for 15 days on blood serum, testosterone level of male Indian palm squirrel (values are mean ± SE, figures in parenthesis are number of animals used)

Treatment	Mean Value Testosterone	P vale
Control	11.147 ± 0.0867	
3 mg/Kg BW	7.137 ± 0.0088	P < 0.001
6mg/KG BW	4.153 ± 0.0027	P < 0.01



DISCUSSION

Determination of testosterone values is very important during the study of male reproduction. Weight, sizes and cytologic structure of testis and accessory reproductive organs and the glands, sperm motility, its viability, morphology and the count, the enzymes the

substrates and the mitotic activities of accessory reproductive glands and their secretory activity etc. all depend upon the level of testosterone in the blood.

Even though for the present work the values of testosterone are measured by very sophisticated technique of Enzyme Linked Fluorescent Assay (ELFA) where an enzyme immunoassay competition method with a final fluorescent detection is used as a principal and is also a more rapid way of determination of hormonal values, a correlation of its biological activities with the different parameters like body weight, organ weight, histological observations of testis, epididymis, seminal vesicle and prostate has been studied.

An overall decrease in the circulating testosterone by ELFA was observed for both the doses of MTX as described by earlier workers.

A number of previous workers have observed a decrease in the values of Testosterone after the administration of various doses of MTX (Sussman *et al.*, 1980; Blatt *et al.*, 1981; Shamberger *et al.*, 1981a, b; Kohler *et al.*, 1986b and Badri 2001). These authors have stated that administration of MTX significantly increases the metabolic clearance rate of testosterone due to an increase in the testosterone A ring reductase activity or probably due to the increase in hepatic A steroid reductase activity or causes suppression of gonadotrophin (LH) secretion and therefore decrease in testosterone level (Shamberger *et al.*, 1981a,b and Kohler *et al.*, 1986b) or according to Narrod and Narrod 1977; Lendon *et al.*, 1978; Shamberger *et al.*, 1981a, b; Hensle *et al.*, 1984 and Saxena *et al.*, 2004, the fall in the blood testosterone concentration could be a direct inhibitory effect of MTX on Leydig cell steroidogenesis or displacement of sex steroid binding protein or as suggested by Kohler *et al.*, 1986 b and Badri *et al.*, 2001, the reduced plasma level of testosterone may be an enzymic defect since the specific activities of 3-β and 17-β hydroxy steroid dehydrogenase were markedly diminished.

In the present work level hepatic steroid A ring reductase activity has not been studied, however, atrophy and reduction in the number of Leydig cells suggest that MTX has direct inhibitory effect on steroidogenesis or the production rate of testosterone from the Leydig cell and therefore on the gonadotrophin (LH) secretion rate which controls the biosynthesis of testosterone from the Leydig cells.

Significant decrease in the testosterone level after high dose treatment, and insignificant decrease after low dose treatment has also been supported by general appearance of the animal, their sluggish behavior, the skinny appearance, due to body and organ weight loss, testicular atrophy, damage to all spermatogenic elements, distortion of tunica propria, damage to Leydig cells, impairment as well as arrest of spermatogenesis resulting into severe reduction of sperms- a condition of oligozoospermia, damage to all cells type of epididymis, abundance of clear cells, limpness of steriocilia, similarly the accessory sex glands which are said to be dependent upon androgen showed severe atrophy in their architecture as well as their secretory activities.



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EFFECT OF FOLLIC ACID ANTAGONIST METHOTREXATE (MTX) ON TESTIS AND ACCESSORY GLANDS OF *FUNAMBULUS PENNANTI* (WROUGHTON)

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ABSTRACT

Effect of Methotrexate on reproductive organ and glands of Funambulus pennanti has been studied by intramuscularly injecting low dose of 3 mg/kg BW/ per day and 6 mg/kg BW/ day for 15 days to adult male squirrel (Funambulus pennanti) during the breeding period. For comparing the effects saline treated vehicle was injected same amount of saline and were maintained for the same duration. After treating weight of testis and reproductive accessory glands (Seminal vesicle, prostate gland and epididymis) measured. It is concluded that Methotrexate has adverse effect on weight of reproductive and accessory organs which are dose and duration dependent besides being toxic, therefore certainly causing reduction in the fertility rate.

Keywords: Methotrexate, Organ weight, Antifertility.

Introduction

Methotrexate (Rheumatrex) is a medicine that is used to treat Rheumatoid arthritis (RA), psoriatic arthritis, Reiter's syndrome and other conditions. Aside from its antineoplastic activity, Methotrexate has also been used with benefit in the therapy of common skin disease psoriasis (McDonald, 1981). Additionally Methotrexate inhibits cell mediated immune reaction and is employed as an immunosuppressive agent, for example, in allogenic bone marrow and organ transplantation and for the treatment of dermatomyositis, rheumatoid arthritis, Wegener granulomatosis and Crohn's disease (Messmann and Allegra, 2001; Feagan *et al.*, 1995). Methotrexate was formerly known as amethopterin, is an antimetabolite drug used in treatment of cancer and autoimmune diseases.

Material and Methods

Testis, epididymis, seminal vesicle and prostate of all the experimental and control animals were weighed separately on an electric balance and a data was maintained.

Observation and Results

Vehicle Treated Control

During active breeding, the weight of the testis varied from 0.430 to 0.450 gms. The epididymis weight varied from 0.060 to 0.080 gms. The seminal vesicle weight varied from 0.210 to 0.240 gms and prostate weight varied from 0.300 to 0.310gms (Table 4 and fig. 38 bar diagram).

Low Dose Treatment (3mg/kgBW MTX for 15 days)

All animals treated with 3mg/kgBW/day showed decrease in organ weight as compared to control animals (Table-1 and fig.1 bar diagram). Similarly there was reduction in the size of testis.

High Dose Treatment (6mg/Kgbw/Day MTX for 15 Days)

6 mg/kgBW/day for 15 days showed pronounced decrease in organ weight as compared to control and low dose animals (Table-1 and fig.1 bar diagram).

Table - 1 Effect of 3mg and 6mg/Kg BW Methotrexate daily for 15 days on testicular, epididymal, seminal vesicle and prostate weights of male Indian palm squirrel (values are mean \pm SE, figures in parenthesis are number of animals used)

Treatment	Mean Value			
	Testicular Wt.	Epididymal Wt.	Seminal Vesicle Wt.	Prostate Wt.
Control	0.433 \pm 0.0053	0.382 \pm 0.0050	0.220 \pm 0.0036	0.297 \pm 0.0039
3 mg/Kg BW	0.426 \pm 0.0032	0.357 \pm 0.0069	0.213 \pm 0.0035	0.278 \pm 0.0015
6mg/KG BW	0.417 \pm 0.0004	0.347 \pm 0.0034	0.204 \pm 0.0035	0.262 \pm 0.0003
P value	P < 0.001	P < 0.5	P < 0.5	P < 0.005

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**SYNTHESIS AND IN VITRO ANTIMICROBIAL ACTIVITY OF SUGAR HYDRAZINO
BENZOTHIOZOLYL THIOCARBAMIDE**

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ABSTRACT

Benzothiazoles are bicyclic ring system with multiple applications. The synthesis of novel glycosides derivatives and investigation of their chemical and biological behaviour have gained more importance in recent decades. Serial of 1-tetra-O-benzoyl-β-D-glucosyl-3-(2)-hydrazino-1, 3-substituted benzothiazolyl thiocarbamide has been synthesized by the interaction of two pharmacophores, tetra-O-benzoyl-β-D-glucosyl isothiocyanates and substituted 2-hydrazino-1,3-benzothiazoles in acetone medium. The reaction mixture was kept at room temp for 24 hrs. Acetone is evaporated then product is recrystallised by petroleum ether (60-80%). Benz-fused compounds have been employed in the synthesis of various compounds which show very potential pharmacological activities. Carbohydrate is the key element in variety of biological phenomena and its N-linked sugar derivatives also exhibit wide range of medicinal activities. Keeping in this view, when one biological active molecule is linked to another, the resultant molecule generally has increased potency. The identities of these newly synthesised 1-tetra-O-benzoyl-β-D-glucosyl-3-(2)-hydrazino-1, 3-substituted benzothiazolyl thiocarbamide have been established on the basis of usual chemical transformations and IR, ¹H NMR and Mass spectral studies. The antibacterial and antifungal activities of also reported. Some of these derivatives exhibit significant antimicrobial activity. These compounds show appreciable activity towards these microorganisms like Escherichia coli, Proteus vulgaris, Staphylococcus aureus, Salmonella typhimurium, Pseudomonas aeruginosa, Aspergillus Niger and Candida albicans.

Keyword: 2-hydrazino-1,3 benzothiazole, substituted benzothiazolyl thiocarbamide, tetra-O-benzoyl-β-D-glucosyl isothiocyanates, Biological studies.

Introduction

In spite of tremendous advance made in modern medicine, there are still a large number of ailments for which suitable drugs are yet to be found. Today, there is a need to develop safer drug for the treatment of pain. Hydrazino benzothiazole and isatin derivatives are an important class of organic heterocycles because of their potential activities are reported to be effective in CNS disorders such as convulsion¹ and depressions². Indole and benzothiazoles its analogs constitute the active class of the compounds possessing wide spectrum of antimicrobial³, anthelmintic⁴, analgesic⁵, anti-inflammatory⁶ and anti-tuberculosis⁷ activities. Benzothiazoles constitute an important class of compounds. In recent years heterocyclic compound analogues and derivatives have attracted strong interest due to their useful biological and pharmacological properties. Benzothiazole, a multifaceted nucleus, has been under research for the last two decades. Being a heterocyclic compound, benzothiazole finds use in research as a starting material for the synthesis of larger, usually bioactive structures. Its aromaticity makes it relatively stable, although as a

heterocycle, it has reactive sites which allow for functionalization. From the literature survey, it has been found that extensive work has been reported on 2-substituted benzothiazole derivatives in past and evaluated for different activities like antibacterial⁸, anticancer⁹, antiviral¹⁰, antitumor¹¹, anticonvulsant¹², neuroprotective¹³, a topical carbonic anhydrase inhibitor and an antihypoxic. Taking this into view, and in continuation of our search for biologically potential benzothiazole derivatives, a certain new derivatives were synthesized taking benzothiazole as the basic moiety. Different benzothiazoles react with hydrazine and this hydrazino benzothiazoles then focused to fuse with N-lactosylated compound¹⁴. Hence, in present work, different benzothiazoles react with hydrazine and this hydrazino benzothiazoles then focused to fuse with N-glucosylated compound.

Results and discussion

Herein, we report the synthesis of various 1-tetra-O-benzoyl-β-D-glucosyl-3-(2)-hydrazino-1, 3-substituted benzothiazolyl thiocarbamide **III(a-d)** by interaction of tetra-O-benzoyl-β-D-

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SYNTHESIS, STRUCTURAL STUDY AND ANTIMICROBIAL EVALUATION OF BIOLOGICALLY IMPORTANT 1-TETRA-O-BENZOYL-B-D-GLOCOSYL-3-ARYL-2-PHENYL THIOCARBAMIDE 2-S-BENZYL-ISOTHIOCARBAMIDE

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Abstract

Carbohydrates are a major class of organic compounds occurring in nature. They include such familiar substances as sugar, glucose, starch, cellulose etc., which are all very important for the maintenance of life in plants and animals. Heterocyclic compounds are widely distributed in nature and are essential to life in various ways. Isothiocyanates are important intermediates belonging to the family of compounds known as heterocumulenes. Isothiocyanates are versatile synthetic intermediates in organic chemistry due to their availability and their tendency to undergo nucleophilic addition and cycloadditions¹⁻³

Series of novel 1-Tetra-O-Benzoyl-β-D-Glucosyl-3-aryl-2-phenyl thiocarbamide 2-S-benzyl-isothiocarbamide was prepared by the interaction of the of 1-Tetra-O-Benzoyl- β -D Glucosyl-3-aryl-2-S-benzyl-isothiocarbamide and Phenyl thiocarbamide in benzene medium. The Reaction was refluxed for 3hr in benzene medium. After completion of the reaction, the reaction mixture was brought to room temperature and the solvent removed under reduced pressure to obtain residue. This residue was triturated several times with petroleum ether (60-80°C) to afford a pale yellow solid. Product was purified from chloroform-petroleum ether. These compounds were screened for their antibacterial activities against *Escherichia coli*, *Staphylococcus aureus*. These compounds show appreciable activity towards these microorganisms.

Keyword: Phenyl Thiocarbamide substituted S-Benzyl isothiocarbamide, Phenyl isothiocyanate, and Biological studies.

1. Introduction:

Sugar isothiocyanate and their thiourea and thiocarbamide derivatives exhibits wide range of pharmacological activities⁴⁻⁷ like antimicrobial, antiviral and antitumor. Isothiocyanates are important intermediates belonging to the family of compounds known as heterocumulenes. Isothiocyanates are versatile synthetic intermediates in organic chemistry due to their availability and their tendency to undergo nucleophilic addition and cycloadditions. Thiourea and its derivatives are a group of compounds possessing a wide spectrum of biological activities such as anticonvulsant, herbicidal and it is versatile reagent in organic synthesis. Also thiomaltosides are an important constitute of carbohydrate chemistry.

2. Experimental

2.1 Material and Methods

All chemicals were research grade. Melting points determined are uncorrected. IR spectra were recorded in KBr on a FT-IR Perkin-Elmer RXI (4000-450cm⁻¹) spectrophotometer. ¹H NMR measurements were performed on a Bruker DRX-300 (300 MHz FT NMR) NMR spectrometer in CDCl₃ solution with TMS as internal reference. The Mass spectra were recorded on a THERMO Finnigan LCQ Advantage max ion trap Mass spectrometer. Thin layer chromatography (TLC) was performed on silica Gel G and spots were visualized by iodine vapour. The compounds describe in this paper were first time synthesized by the multistep reaction protocol.

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Synthesis, Spectral Studies And Screening Of 1-Phenyl-3-(2)-Hydrazino-1,3 -Substituted Benzothiazolyl Thiocarbamides

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Abstract:-

Benzothiazole is one of the most important heterocyclic compound, a weak base, having varied biological activities and still of great scientific interest nowadays. They are widely found in bioorganic and medicinal chemistry with application in drug discovery. Benzothiazole is a privileged bicyclic ring system. Due to its potent and significant biological activities, it has great pharmaceutical importance; hence, synthesis of this compound is of considerable interest. The small and simple benzothiazole nucleus if present in compounds involved in research aimed at evaluating new products that possess interesting biological activities. Keeping in this view, when one biological active molecule is linked to another, the resultant molecule generally has increased potency.

Hence for the first time, in present work, we have interacted two pharmacophores, phenyl isothiocyanate and substituted 2-hydrazino-1,3-benzothiazoles in acetone medium to yield 1-Phenyl-3-(2)-Hydrazino-1,3-Substituted Benzothiazolyl thiocarbamides. 1-Phenyl-3-(2)-Hydrazino-1,3-Substituted Benzothiazolyl thiocarbamides have been established on the basis of usual chemical transformations and IR, ¹H NMR and Mass spectral studies. The antibacterial activities of also reported. Some of these derivatives exhibit significant antimicrobial activity.

Keyword: 2-hydrazino-1,3 benzothiazole, substituted benzothiazolyl thiocarbamide, phenyl isothiocyanate, Biological studies.

Introduction:

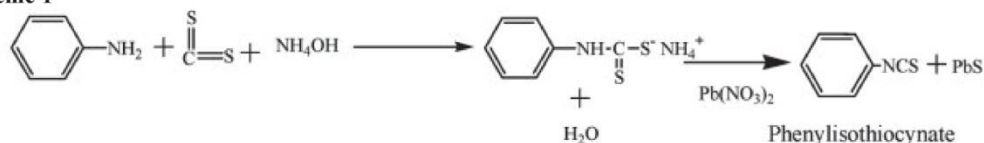
Benzothiazoles are bicyclic ring system with multiple applications. A number of 2-aminobenzothiazoles were intensively studied, as in medicinal chemistry^{1,2} and reported cytotoxic on cancer cells³. Benzothiazole moieties are part of compounds showing numerous biological activities such as antimicrobial⁴⁻⁸, anticancer⁹⁻¹³, anthelmintic¹⁴, and anti-diabetic¹⁵ activities. They have also found application in industry as antioxidants, vulcanization accelerators. Various benzothiazoles such as 2-aryl benzothiazole received much attention due to the unique structure and its uses as radioactive amyloid imaging agents and anticancer agents. In this review, we have discussed in brief about some commonly developed benzothiazole derivatives and various structural alterations conducted on benzothiazole ring and preferential specificities imparted in their biological responses. Hydrazino benzothiazole and isatin derivatives are an important class of organic heterocycles because of their potential activities are reported to be effective in CNS disorders such as convulsion and depressions. Indole and benzothiazoles its analogs constitute the active class of the compounds possessing wide spectrum of antimicrobial, anthelmintic, analgesic, anti-inflammatory, and tuberculosis activities

Results and discussion

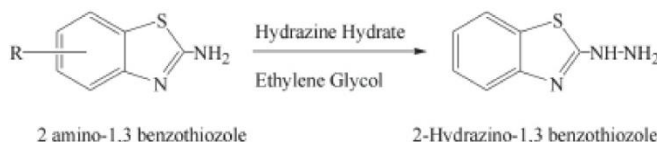
Herein, we report the synthesis of various 1-Phenyl-3-(2)-Hydrazino-1,3-Substituted Benzothiazolyl thiocarbamides **III(a-g)** by interaction of Phenyl isothiocyanate (**I**) and substituted 2-hydrazino-1,3-benzothiazole **II(a-g)** in acetone medium. All products were crystallized from ethanol before recording the physical data (Table-1). The purity of compounds was checked by TLC. The spectral analysis¹⁵⁻¹⁷ IR, ¹H NMR and Mass spectra of the product were observed. Optical rotation of the product was also recorded. **III (a-g)**

Scheme for synthesis shown as follows:

Scheme 1



Scheme 2





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Synthesis, structural studies and screening for antimicrobial activity of *N*-glucosylated bisdithiazolidines [1, 4-Bis (3- tetra-*O*-acetyl β -D-glucopyranosylimino-5-aryl-1, 2, 4-dithiazolidin-4'yl)-benzene.]

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Abstract— *N*-Glucosylated bisdithiazolidines [1, 4-Bis (3- tetra-*O*-acetyl β -D-glucopyranosylimino-5-aryl-1,2,4-dithiazolidin-4'yl)-benzene.] have been prepared by the interaction of 1,4-(3,3'-bis-tetra-*O*-acetyl β -D-glucopyranosyl-thiocarbamido)benzene (1) and *N*-aryl-*S*-chloro isothiocarbamoyl chloride (2). The intermediate 1,4-(3,3'-bis-tetra-*O*-acetyl β -D-glucopyranosyl-thiocarbamido)benzene was prepared by refluxing tetra-*O*-acetyl β -D-glucopyranosyl isothiocyanate with *p*-phenylene diamine in chloroform. The synthesized compounds were characterized by analytical, IR, NMR and mass spectral studies and were screened for their antibacterial and antifungal activities.

Keywords— *N*-Glucosylated bisdithiazolidines, 1, 4-(3,3'-bis-tetra-*O*-acetyl β -D-glucopyranosyl-thiocarbamido)benzene.

1. INTRODUCTION

The disulphide (-S-S-) linkage in dithiazolidines is considered responsible for its varied biological and physiological activities¹⁻¹³. Dithiazolidines are also reported as heterocyclic inhibitors for prevention of mild steel corrosion¹⁴. Looking at the importance of dithiazolidines, we are reporting the synthesis, structural and biological studies of *N*-Glucosylated bisdithiazolidines [1,4-Bis (3- tetra-*O*-acetyl β -D-glucopyranosylimino-5-aryl-1,2,4-dithiazolidin-4'yl)-benzene.] .

2. Experimental:

Melting points determined by using electro thermal apparatus are uncorrected. FT-IR spectra were recorded using KBr disk on Perkin Elmer FT-IR KBR spectrophotometer.

¹H NMR spectra were recorded on Bruker avance-II 400 NMR spectrometer at 400 MHz. The spectra were recorded using TMS as internal standard and chemical shifts were reported relative to it in parts of chromatography on Merck Silica Gel 60 F₂₅₄ plates with detection by UV light and spots were visualized by iodine vapours. The compounds were screened for their antibacterial and antifungal activities by the agar diffusion method.

I) Preparation of the intermediate 1,4-(3,3'-bis-tetra-*O*-acetyl β -D-glucopyranosyl-thiocarbamido)benzene (1):

The 1,4-(3,3'-bis-tetra-*O*-acetyl β -D-glucopyranosyl-thiocarbamido)benzene was prepared by the reaction of 2,3,4,6 tetra-*O*-acetyl β -D-glucopyranosyl isothiocyanate (TAGNCS)¹⁵⁻¹⁷ 1.9450 g (0.0050mole) and *p*-phenylene diamine 0.27g (0.0025mole) by refluxing them for 4 hours in chloroform. After the completion of reaction, the reaction mixture was cooled, the solvent was distilled off to give granular solid (1). It was crystallized from ethanol to afford cream coloured crystals. Yield 95 %, mp 175°C.

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STUDY ON ZOOPLANKTON DIVERSITY OF FRESH WATER LAKE OF KONDESHWAR NEAR AMRAVATI, MAHARASHTRA

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Abstract: The aquatic ecosystem is very important ecosystem in the world which occupies maximum area where the animals residing in it are always under the trace due to continuous changes in the aquatic environment resulting into change in its physio-chemical parameters. The zooplankton- the important ecological indicator of fresh water bodies serve as a major component of aquatic food chain. They also help to maintain proper equilibrium between biotic and abiotic components of the aquatic ecosystem. The present investigation deals with the study of zooplankton diversity of Kondeshwar Lake, near Amravati. The work was carried out for one year i.e. December 2011 to November 2012. The zooplankton diversity of lake water was represented by 5 different groups i.e. protozoa, rotifera, cladocera, copepoda and ostracoda. zooplankton species were recorded from the kondeshwar lake. The maximum species of rotifers was noted indicates the polluted nature of lake due to the anthropogenic activities.

Key words: Zooplankton , Kondeshwar Lake, Diversity.

INTRODUCTION

The aquatic ecosystem is very important ecosystem in the world which covers maximum area where the animals residing in it are always under the trace due to rapid changes in the aquatic environment resulting into change in its physio-chemical parameters, Lampert & Sommer (1997). The zooplankton are small, microscopic animals that lives in water column of almost all water bodies and acts as primary and secondary links in the food chain of all aquatic ecosystem. These zooplankton are very important components of fauna of freshwater bodies. The occurrence and richness of zooplankton depends on its productivity which in turn is influenced by abiotic factors and the level of nutrients. The freshwater zooplankton form an important group as most of them feed upon and incorporate the primary producers into their bodies and make themselves available to higher organisms in food chain Michael(1973); Santos-Wisniewski *et al.* (2006)). With the global loss of many species everyday as a result of pollution and habitat Moreover, zooplankton communities are sensitive to human activities and that is why their study may be useful to know of long-term changes in lake ecosystems, as these communities are highly sensitive to environment fluctuations Ferrara, Vagaggini, & Margaritora, (2002); Preston & Rusak,(2010). it has been reported by several studies that zooplankton can serve as an indicator of changes in trophic dynamics and the ecological state of lakes related to changes in nutrient loading and climate ,Caroni & Irvine(2010). Hence, current study was undertaken to investigate the impact of human disturbance in zooplankton diversity in the kondeshwar lake at Amravati, Maharashtra. The study area of the present study is shown by using satellite image and indicated as Fig 1.

Fig.1: Satellite image of Kondeshwar Lake



MATERIALS AND METHODS

The present study was carried out on Kondeshwar lake which is located in the middle of dense forest surrounded by hills, shrubs, mix heighted trees and agricultural land. It is situated near an ancient elephant temple known as Kondeshwar temple, dedicated to Lord Shiva. The water samples were collected for a period of 1 year from December 2011 to November 2012 at three different sites in order to assess the fauna prevailing in this water body. The surface water samples were taken from the study site once in a month between 8.30 am to 10.30 am in wide mouth plastic bottles. The spot parameters like pH, Humidity, Water temperature, Air temperature was recorded at sampling spot by using Thermometer and Pocket digital pH meter and other physicochemical parameters like TDS, Dissolved oxygen, etc were estimated as per standard methods

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**Alterations In Some Haematological Parameters And serum Proteins
During Addiction To Opioid Drug Contramal****R. L. Rahatgaonkar**Department of Zoology,
Shri RL.T college of Science, Akola

The male albino mice were made addicted to opium by administrating (im) smaller doses of opioid drug "Contramal" daily for 60 days. After 60 days the mice were sacrificed for investigations pertaining to serum protein profile and haematological alterations. Significant increase in α_2 and γ globulins was recorded indicating nephrotoxic and hepatotoxic effect of opium after long term addiction

Introduction

Recent speculations have suggested that haematological tests are important diagnostic tools which may be equally valuable as indicators of disease or stress due to drug reactions or toxicants or pollutants. The blood plays an integrated and inevitable part in all immune systems (Lachmann and Peters, 1986; Sadhana *et al.*, 1987; Haedikarin, 2000) Haematological parameters are related to the responses of the organisms to the changing physiological conditions and hence can be used to know the healthy state and tolerance capacity of the animals (Briton, 1963 and Johri *et al.*, 1990). Further, haematological changes obtained during toxicological studies.

Anaemia due to decreased level of hemoglobin content or decreased number of erythrocytes, increase on lymphocytes and neutrophils in nephrosis and liver necrosis are well known haematological alterations (Dacie and Lewis, 1977; Singh *et al.*, 1984 Gupta *et al.*, 1986)

An opioid analgesic drugs which interferes with functioning of cells involved in immune response as this drug is known to cause injury to bone marrow cells. Anaemia associated with decreased erythrocytes, hemoglobin percentage and haematocrit value has also been recorded to occur in response to drug addiction (Mello, 1987)

Because of the above rather contradictory results in the haematological literature and histo-pathological lesions obtained it was thought to study the chronic effects of contramal with special reference to serum protein profile and haematological alterations in the albino mice.

Materials and Methods

The present investigations were carried out on the male Swiss albino mice weighing about 30 ± 2 g. The mice were obtained from the animal house of P.D. Medical college, Amravati. They were maintained under standard laboratory conditions and fed with pellet diet. (Lipton, India) and water *ad libitum*. Proper care was taken to avoid any infection and only healthy mice were used for experimental purpose.

The mice divided into two groups. Group I was treated as control and it comprised of 10 male and 10 female mice, administered (im) with 0.2ml distilled water, as a vehicle daily once up to 60 days. The Group II was an experimental group, comprised of 10 males and 10 females mice. Only male mice were administered (Im) with 0.05 mg/kg dose of contramal daily once up to 60 days.

Contramal (tramadol Hydrochloride, 100 mg) was purchased from S G Pharma, Baroda, India. The chemical name of the drug is (1 RS)-2-(dimethylamino methyl)-1-(4-methoxyphenyl)cyclohexanol-hydrochloride.

After 30 and 60 days of the drug administration the male mice of both the groups i.e. control as well as experimental, venous blood from the orbital sinus of each mice was drawn with the help of a corning thin glass capillary. 0.5 ml blood was collected in heparinized glass was taken into eppendorf tube to separate the serum. After blood collection the male mice was sacrificed with cervical dislocation.

The haemoglobin (g %) was recorded by the method of Sahil's acid haematin and RBC count, total leucocytes count, differential leucocytes count was calculated by the method of Neubauer's chamber (Dacie and Lewis, 1977) The serum protein profile was recorded by using PAGE and scanned on Systronic Densitometer (Type 201)

The results are reported as mean \pm SE (n =6) and statistical analysis was done by student 't' test (Fischer, 1950)

Observations and results

No mortality was observed during the experimental period in all the mice administered (im) with the vehicle and contramal separately. The data showing the changes in some blood parameters of male albino mice after intramuscular administration of contramal for 60 days has been summarized in table (I). The intramuscular



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**MORPHOLOGY AND VIABILITY OF POLLEN GRAINS FROM
GOSSYPIUM VARIETIES****A.A. Sangole¹ and J.A. Tidke²**
anjalisangolc05@gmail.com¹Department of Botany, Shri. R.L.T. College Science, Akola, Maharashtra, India²Laboratory of Reproductive Biology of Angiosperms, Department of Botany,
Sant Gadge Baba, Amravati University, Amravati, Maharashtra India**ABSTRACT**

The characterization and viability of pollen grains are useful tools in breeding programs. The objective of this study was to describe the morphological patterns and viability of pollen grain from selected varieties of *Gossypium* spp. Pollen morphological observation were made using light and scanning electron microscope, where as the viability was performed by in vitro germination and histochemical analysis (2,3,5 triphenyltetrazolium chloride). In-vitro pollen germination was carried out in different media such as sucrose, boric acid, calcium nitrate and magnesium sulphate with 10%, 20%, 30%, 40%, and 50% concentrations. Selected varieties shows the same shape, type and no alteration in ornamentation pattern. In vitro pollen germination shows that maximum in sucrose solution of 30% and 40% concentration in all varieties. The histochemical analysis overestimated pollen viability when compared with the in vitro results. The results is investigated that breeding of *Gossypium* varieties by increasing to understanding of their morphology and pollen viability.

Keywords: in vitro germination, histochemistry, scanning electron microscopy, *Gossypium* varieties, pollen tube.

Introduction

The genus *Gossypium*, to which cotton belongs, contains a number of species. Some authorities include many different varieties and forms under a few species, though others draw the species lines closer. For proper classification of the genus *Gossypium*, the difference and similarities between the several species comprising the genus must be recognized. The study of form and structure of cotton plants, therefore, is of fundamental importance (Balls, 1919; Brown, 1938; Hayward, 1938 and Hector, 1936). In cotton there are approximately 10,000 pollen grains in a flower. The mature pollen is three nucleate (Cannon, 1903; Balls, 1905; Denham, 1924 and Beal, 1928). The pollen grain of upland (4n) and Indian (2n) varieties are the smallest. The morphological characters of pollen grains or spores are embodied in the exine and are important criteria in consideration of the taxonomy and inter-relationships of plants at various taxonomic levels. Moreover, knowledge of the exine morphology of various sporomorphs is of primary importance. Pollen grains and spores are reproductive propagules of diagnostic value of virtue of the characters embodied in the exine (Erdtman, 1952). The pollen grain can also be useful tool in

evolutionary consideration has been demonstrated by Wodehouse (1935).

Pollen histochemical analysis are carried out for the following reasons i) possible relation between the pollen content and the mode of pollination ii) study of pollinator foraging behavior, nutritional demands, pollination mode, pollen content and iii) composition in relation to phylogeny (Dafni, 1992). Lipids and starch are important constituents of the pollen grains to establish the relations with flower foragers.

Viability means ability to live; but pollen viability is the ability of pollen to complete post-pollination events and to effect fertilization. In the old literature the terms pollen viability and pollen sterility were used interchangeably (Shivanna and Rangaswamy, 1992). As viability refers to the ability of pollen to deliver functional gametes to the embryo sac, the most authentic test to viability would be to assess the fertilization capacity of the pollen as measured by fruit and seed set following controlled pollination (Heslop-Harrison and Shivanna 1984 and Shivanna and Rangaswamy, 1992).

Number of pollen grains viable to germinate at the time of germination after their deposition on stigma is an important event in the process

The screenshot shows the Web of Science Master Journal List interface. At the top, there are navigation links: Master Journal List, Search Journals, Match Manuscript, Downloads, and Help Center. A search bar contains the ISSN 2319-4979, and a 'Search' button is visible. Below the search bar, the results show 'Found 1 results (Page 1)'. The search results section is titled 'Exact Match Found' and displays the following information:

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Aeromycological Investigation of Indoor Environment of College Laboratories**Shailendra Madavi***
and Anjali SangoleDepartment of Botany,
Shri R.L.T. College of Science, Akola (MS)**Abstract-**

Laboratories are major working areas of science colleges. They are being sterilized for better, contamination free environment time to time. Still these areas get contaminated due to airborne microorganisms. The major contaminants of the laboratory are aeromycoflora. Thus, the present investigation explores the aeromycoflora of indoor environment of Shri R.L.T. College of Science, Akola (MS). The study was undertaken at the beginning of monsoon i.e. from June to August. For this, 5 petri-dishes with Potato Dextrose Agar (PDA) media were kept open in each laboratory for 1 hour. After incubation period fungi were isolated and identified. Total 22 species belonging to 16 genera were isolated. Most dominant class was Ascomycetes, while Zygomycetes, Oomycetes and Deuteromycetes were quite less in number. Most dominant genera were *Aspergillus*, *Rhizopus* and *Penicillium*.

Key words- Aeromycoflora, Indoor Environment, laboratories, fungi.

Introduction-

College is the place where students not only explore the knowledge of world but also, learn how to live in society. They study various theoretical as well as practical courses. But, the actual knowledge they get by practical experiments. These experiments are performed in laboratories. The laboratories are the rooms which are equipped with different instruments and used for various scientific experiments, testing and teaching. These laboratories are provided with sophisticated environment. But, still these laboratories get contaminated due to airborne microorganisms. The major contaminants of laboratories are aeromycoflora. Fungal spores constitute a significant fraction of bioaerosol and they are often much more numerous than other airborne bioparticulate matters. Airborne microfungus propagules are found in large numbers in indoor and outdoor environments and are widely distributed in nature in general. Some of them have the potentiality to cause allergies, spoilage of foods and many other adverse health effects, namely, bronchial asthma, allergic rhinitis and atopic dermatitis (Burge and Rogers, 2000; Terui et al., 2000; Akiyama, 2001). Since diverse fungal species constitute the major components of airborne flora are the major cause of respiratory ailment of humans, causing allergies, asthma and plant diseases and as well as important agents of degradation of cellulosic and non-cellulosic material in indoor closed environment, thus there is a great need for understanding, aerobiological studies from indoor environment of different laboratories where number of students work.

So, present investigation was undertaken in Botany, Chemistry, Microbiology and Zoology department laboratories of Shri R. L. T. College of Science, Akola. Akola city is the district headquarter situated in the middle east of Maharashtra state. The average rainfall in this district is 750 mm to 1000 mm. and the average temperature is 30^oC. In Akola city, Shri R. L. T. College of Science is one of the reputed science college, where thousands of students studies every year. So, the present investigation undertaken to understand relationship of aeromycoflora and health related issue.

Material and Methods-

The aeromycoflora of four laboratories was isolated by Culture Plate Exposure method (Lanjewar and Sharma, 2014). For this, petri dishes containing potato dextrose agar (PDA) were exposed for 10 min. in Botany, Chemistry, Microbiology and Zoology laboratory during three monsoon months i.e. from June to August in different corners of the laboratories. The exposed petri dishes were incubated at 27^oC for 3-5 days. The appeared colonies on agar plates were recorded and species were identified by microscopic and morphological characters using compound microscope.

Result and Discussion-

The present investigation was undertaken in four laboratories namely, Botany, Chemistry, Microbiology and Zoology laboratories of Shri R. L. T. College of Science, Akola. This investigation shows that, use of Culture Plate Expose method is one of the good method to isolate aeromycoflora. During this investigation, total 1269 fungal colonies were reported. From these colonies total 22 species belonging to 16 genera were identified (Table-1).

The most dominant division was Deuteromycota with 12 genera followed by Ascomycota with 6 genera. Zygomycota and Oomycota had least number of genera i.e. 2 and 1 genera respectively. One unidentified sterile hyphae also reported. No genera of Basidiomycota was reported from any plate (Graph -1).



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Comparative Phytochemical Screening Of Leaves Of *Peltophorum Pterocarpum* And *Tephrosia Purpurea*

Anjali Sangole, Shailendra Madavi

Department of Botany Shri. R.L.T. College of science Akola (MS)

Abstract:

Flower of pletophorum pterocarpum and Tephrosia purpurea ,have been used for several purposes such as medicine, food and garnishing . The present study investigated on phytochemical analysis of leaves of Peltophorum pterocarpum and Tephrosia purpurea was carried out. Peltophorum p.and Tephrosia p. is belongs to family Fabaceae and has been widely used for therapeutic applications of the many diseases. The phytochemical study of various extracts of leaves of Peltophorum pterocarpum and Tephrosia purpurea revels the presence or absence of phytochemical components such as Tannin, Saponin, Flavonoid, Phenol, Alkaloid was carried out.

Keywords: Phytochemical analysis, Tannin, Saponin, Flavonoid, Phenol, Alkaloid

Introduction :

World Health Organization had reported that nearly 65-80% of world's population in developing countries depends on the traditional medicine for their primary health care and treatment of various diseases. Herbal medicine is the oldest form of health care. Many drugs commonly used today are of herbal origin. Medicinal plants are rich so of novel drugs that forms the ingredients in traditional system, modern medicines, pharmaceutical intermediates and lead compounds in synthetic drugs {4}. Many plants are a good source of herbal medicine and natural products for many therapeutic application. The bioactive natural sources which are extracted from medicinal plants which shows many used and no side effects. In addition to therapeutic applications of medicinal plants, they are also a great source of chemical constituents which could be act as newer leads and guide for modern drug design and development [8]. Different parts of this tree are used to treat many diseases like stomatitis, insomnia, skin diseases, constipation, ringworm and its flower extract is known to be a good sleep inducer and used in insomnia treatment [1-6]. In recent times focus on plant research has increased all over the world and a large body of evidence has collected to show immense potential of medicinal plants used in various traditional systems [7] including treatment against hepatocellular carcinoma [3]. In addition to therapeutic applications of medicinal plants, they are also a great source of chemical constituents which could be act as newer leads and guide for modern drug design and development.[6] The plants consist of very important class of phytoconstituents such as alkaloids, flavonoids, steroids, glycosides, terpenes, tannins and phenolic compounds, which were used treatment of various diseases.[2] It is well known that there is a strong correlation between the phytoconstituents and their bioactivity towards the diseases is potential tool for the design and synthesis of new bioactive compounds with specific activities for treatment of various diseases.[5] Therefore, it is highly desirable to investigate preliminary phytochemical screening of plants in order to discover and develop novel bioactive therapeutic drugs with improved efficacy.

Material and Methods

Collection and extraction of medicinal plants

The sample of these two plants was studied and was collected from Akola in month of November 2018. The leaves of plants were dried in normal temperature and were made coarse power. The powder was extracted with 600 ml of methanol using soxhlet apparatus till exhaustion for about 48 h. The methanol extract was concentrated under vacuum at 40 °C to get the residues

Phytochemicals	<i>Peltophorum pterocarpum</i>	<i>Tephrosia purpurea</i>
Alkanoids	+	+
Flavonoids	+	+
Phenols	+	+
Saponin	-	+
Steroids	+	+
Tannins	+	+



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A Novel Studies of Synthesis of Nanoparticle of Some Maltosyl thiobiurets and Their XRD, SEM and Microbial Studies

Ashish G. Sarap

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Abstract:

The chemistry of thiourea of carbohydrate is extensively elaborated and well documented. The use of microwave irradiation in organic synthesis has become increasingly popular within the pharmaceutical and academic arenas, because it is a new enabling technology for drug discovery and development. A huge number of research papers have appeared over the last decades on the application of microwave technology in organic synthesis. By taking advantage of this efficient source of energy, These compounds arouse interest as potential biologically active substances and versatile intermediates for preparing various derivatives. They have been found useful in the treatment of hypertension, as appetite suppressant and as a potential anti oxidant cardio protective agent. Chemistry of sugar isocyanate with special reference to their utility as intermediate in the synthesis of nitrogen and sulphur containing open chain and cyclic compound. Several lactosyl thiobiurets derivatives has been prepared by condensation of hepta-O-acetyl-B-D-maltosyl isocyanate with various aryl thiocarbamides by microwave method. The identities of newly synthesis compounds have been established on the basis of usual chemical transformation and IR, NMR, Mass spectral studies.

Keywords: *Hepta-O-acetyl-B-D-maltosyl isocyanate, Aryl thiocarbamides, maltosyl thiobiurets.*

Introduction:-

In recent years, the electromagnetic energy in the range of microwaves have gained special attention as regards the most various fields of utilization such as the alimentary (domestic ovens), analytical (small ovens devoted to the mineralization), and that one of bio-medical applications¹. In the field of organic synthetic chemistry, a certain delay has been suffered either in the base research for the clear improvements which can lead to higher yields of cleaner products, minor energy consumption, and environmental compatibility. This delay can, however be rapidly reduced by use of electromagnetic energy caused by microwaves. Thus microwave energy can be used and is been used as an activating agent in chemistry for the synthesis of a large variety of compound. Numerous organic reaction assisted by microwave heating have been explained in various article and book^{2,3}. These concern the acylation and alkylation reaction, aromatic nucleophilic substitution, condensation, cycloaddition, protection, deprotection reaction, esterification and transesterification, heterocyclisation, rearrangement, organometallic reaction, oxidation and reduction⁴.

Microwave-assisted organic synthesis (MAOS) has been known since 1986⁵. This non-conventional synthetic method has shown broad applications as a very efficient way to accelerate the course of many organic reactions, producing high yields, higher selectivity and lower quantities of side products consequently easier work-up and purification of the products. MAOS is considered as a green technology, principally since many organic reactions can be carried out in solvent-free conditions⁶.

However, a limited numbers of these reaction regard so for the carbohydrate chemistry, and since carbohydrate play an important role in vast array of biological processes, and particularly there are many advantages for example in carbohydrate based drug such as low toxicity and immunogenicity the interest in their preparation is very high, another example may be taken of sugar isothiocyanate and isocyanate which are among the most versatile synthetic intermediate in carbohydrate chemistry. They play a pivotal role in the preparation of a broad series of functional group such as amide, isonitrile, carbodimide and *N*-thiocarbonyl oxidation dyes⁷ for printing the padding animal and vegetable fibers by standard oxidation dyeing method. Many of them have also shown antitumor and tuberculostatic activities⁸. *N*-glucosylated compound may be broadly classified into two ways. The first in which glucosyl group is attached to the nitrogen of non-cyclic compound or the exocyclic nitrogen. For example nucleic ring while the second in which glucosyl group is attached to the nitrogen of noncyclic compound or the exocyclic nitrogen. For example nucleosides represent the first category while glucosyl amines, glucosylureides, glycosylthioureides belong to second category.



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A MICROWAVE ASSISTED SYNTHESIS OF 1-TETRA-O-ACETYL-B-D-GLUCOSYL-3-ARYL-CARBAMIDE AND THEIR COMPARATIVE STUDIES

A.G. Sarap

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ABSTRACT

The use of microwave irradiation in organic synthesis has become increasingly popular within the pharmaceutical and academic arenas, because it is a new enabling technology for drug discovery and development. A huge number of research papers have appeared over the last decades on the application of microwave technology in organic synthesis. The chemistry of thiourea of carbohydrate is extensively elaborated and well documented. By taking advantage of this efficient source of energy, These compounds arouse interest as potential biologically active substances and versatile intermediates for preparing various derivatives. They have been found useful in the treatment of hypertension, as appetite suppressant and as a potential anti oxidant cardio protective agent. Several glucosyl carbamide derivatives has been prepare by condensation of tetra-O-acetyl-B-D-glucosyl isocyanate with various aryl thiocarbamides by microwave method. The identites of newly synthesis co,mponents have been established on the basis of usual chemical transformation and IR, NMR, Mass spectral.

Keywords: *Tetra-O-acetyl-B-D-glucosyl isocyanate, Aryl thiocarbamides, glucosyl carbamides*

Introduction

Microwave technology has been applied beneficially into a number of organic reactions. The microwave assisted hydrolysis of esters is well-known but the regioselective hydrolysis of esters at the anomeric position in sugars under this condition has not been described.

Microwave assisted organic synthesis has become an important tool to medicinal chemists for rapid organic synthesis. A huge number of research papers have appeared over the last decades on the application of microwave technology in organic synthesis.¹ Some of the major advantages include spectacular decrease in reaction time, improved conversions, clean product formation and wide scope for the development of new reaction conditions.

The use of polymer-supported reagents and scavengers is a powerful technique for expedited synthesis and purification.² Rapid transformations using microwave technology has shifted the bottleneck from synthesis to the work-up and purification step. Therefore, chemists are increasingly looking for an expedited synthesis and purification strategy that would combine the use of microwave heating with polymer-assisted solution-phase organic synthesis. This overview³ covers the recent literature on the significant new

applications of polymer-supported reagents and scavengers using microwave heating.

Carbohydrates derivatives have been extensively investigated including synthesis, characterization and biological activity. Partly due to the facts that many natural occurring saccharides and synthesized analogues exhibit various and potent biological activities and they have been widely employed as agrochemicals and pharmaceuticals⁴⁻⁷.

Carbohydrates exist in a large elemental as well as stereochemical variety, as they are built up from monosaccharides of various kinds, forming diverse branched or linear oligomers as well as different class of poly-saccharides. Carbohydrates possess large numbers of functionalities, at least one carbonyl and several hydroxyl functions per monosaccharides and often carry further kinds of functional groups. They are compounds with several stereocenter and thus the carbohydrate group consists of a large numbers of stereoisomers. Synthetic carbohydrate chemistry, as a result of the structural complexity of carbohydrates is a challenging field for organic chemist. The initial carbohydrate chemistry deals with the structure of carbohydrate and solved basic question of the stereochemistry problem connected with it. This was mainly due to Emil Fischer, who solved all these basic questions, by the end of nineteenth century. Later in the 1960's all main

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SYNTHESIS OF 1-ARYL – 5 - TETRA – O – ACETYL – B – GLUCOSYL – 2 - S – BENZYL – 2, ISOTHIABIURETS**Ashish G. Sarap****Shri R. L. T. College of Science, Akola-444 001****Maharashtra, India.****E-mail: sarap.aashish1@gmail.com****ABSTRACT:**

Several 1-aryl – 5 - tetra – O – acetyl – β – glucosyl – 2 - S – benzyl – 2, isothiabiurets have been prepared by the interaction of aryl – S – benzyl isothiocarbamides and tetra – O – acetyl - β – glucosyl isocyanate. The structures of the newly synthesized compounds have been established on the basis of usual chemical transformations and IR, NMR and Mass spectral studies.


Keywords: *N* - glucosides, aryl – S – benzyl isothiocarbamides, glucosyl isocyanate, isothiabiurets.

INTRODUCTION:

Glycosyl Carbamides and Glycosyl thiocarbamides have great pharmacological and biochemical aspects¹. Many of these derivatives have been found to possess wide applications in industry as Carbohydrate based detergent² and in medicine as anticancer agent³ and antifungal agents⁴.

Glucosyl isocyanate and isothiocyanate⁵, likewise other glycosyl isocyanates has a significant role in synthetic Carbohydrate Chemistry. Many compounds have been synthesized by the use of glycosyl isocyanate, for example, galactosyl isocyanide⁶, galactosyl amino derivatives⁷ and other heterocycles⁸. But there is no report on the synthesis of isothiabiurets having a β - glucosyl substituent. On the basis of knowledge gained on the work done on *N*-glucosylated isomonothio and dithiabiurets⁹⁻¹⁰, it was quite interesting to synthesize some new *N*-glucosylated thioamides.

In the present Communication, we report the synthesis of 1-aryl – 5 – tetra – O – acetyl – β – glucosyl -2-S-benzyl- 2, isothiabiurets by the interaction of tetra – O – acetyl – β - glucosyl isocyanate and aryl-S-benzyl isothiocarbamides. All the products obtained have been crystallized from alcohol. IR spectra of the products show characteristic absorption of prominent peaks, ¹H NMR spectra shows characteristic peaks due to N-H, acetyl and glycosidic protons, while the ESI Mass spectra shows peaks due to acetogalactose unit¹¹⁻¹³.



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Avoid Duplicated Space For Same Files Specially On Social Media

Mr. Ram B. Ghayalkar

Assistant Professor

Shri R. L. T. College of Science Akola

Abstract:

Now a days everyone smart phone holder using with whatsapp like social apps so plenty of images/videos/documents are stores every day in our mobile phones ultimately space gets reduce time to time and that is the biggest problem to manage these files. In this paper presents proposed solution to avoid this duplication of data for storing of memory space in mobile phones. Here presents a framework that will work on to avoid duplication of data.

Key Words: Social Apps, image/video processing, memory management, mobile computing.

Introduction:

Now we may say that the place of desktop computer is taken by mobiles, people are more familiar with smart phone than computer systems. And now there are various application i.e apps are also available for variety of functions and services on mobile phones. Some Social media site/apps(whatsapp) provide manual mechanism to select or download media file.

For avoiding duplicated files i.e images, videos, documents pdf etc. Basically there are two technologies comes:

i) Identification of duplicated files:

For identification of any files, different feature extraction and classification techniques as well as some meta-data used to identify identical files.

ii) Technique used to avoid duplication.

For reducing duplicated memory space, file compression techniques used.

Literature Review:

Nowadays WhatsApp became very popular for sending messages, chatting sharing picture of videos etc. News or any post that spread very quickly whether it is constructive or destructive.[1]

As per the survey, the maximum percentage of WhatsApp users are from age group from 26 to 35 and the minimum percentages are from senior citizen. WhatsApp provides a facility to send different types of messages like text, images, video, audio, and others. Author reported that text messages are used more as compared to other types of messages [2].

The very fast and rapid increasing use of mobile devices encourages the information system community to design efficient and easy communication solutions. Rather than just messaging applications IMAs, specially WhatsApp, provide users with new and simple communication experience. However, the limited space for storing of mobile devices might negatively impact the user experience of these services.[3]

Low storage space is the most important issue. In this paper author solved the issue of low space due to image duplication of file by the used hash function (MD5), Huffman code is use to generating unique code for each and every image and save this huffman code in image in the index file and use it to avoid of a duplicate from device's storage. [4]

the notion of authorized data de-duplication was proposed to protect the data security by including differential privileges of users in the duplicate check, presented several new de-duplication constructions supporting authorized duplicate check in hybrid cloud architecture, in which the duplicate-check tokens of files are generated by the private cloud server with private keys. Security analysis demonstrates that our schemes are secure in terms of insider and outsider attacks specified in the proposed security model.[5]

In this paper, Author presented a novel approach to realize cipher text policy attribute-based storage system support secure de-duplication. Storage system is built under a hybrid cloud architecture, where a private cloud manipulates the computation and a public cloud manages the storage. If the proof is valid, the private cloud runs a tag matching algorithm to see whether the same data underlying the cipher text has been stored. If



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Review on Social Media Sentimental/ Opinion Analysis

Mr. Ram B. Ghayalkar¹

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Abstract:

After introducing of social media sites, information is quite faster transferring from one place to other easily, but with this there are some pros and cons. Sometimes wrong information of rumors spread very fast as well as people sending their views or opinion about person, any product etc, so here opinion or sentimental analysis plays very important role. In this paper research review of sentimental/ opinion data analysis is used to identify and analysis of comments or opinions of different people from different sites for person, issues, events, topics and their attributes or some business review which will then useful in decision making.

Keywords: Information retrieval, sentiment analysis, opinion mining, data mining

Introduction:

Sentiment analysis or opinion mining is the computational study of people’s opinions, attitudes, appraisals, and emotions toward entities, individual person, issues, events, topics and their attributes. “What other people are thinking” is always an essential piece of information during the decision-making process in business intelligence.

For example, In businesses there is importance of public or consumer opinion about product or services.

Now use of social media in everywhere (i.e., reviews, forum discussions, blogs and social networks) on the internet, individuals and organizations are increasingly use of public opinions in these media for their decision making.

It is a very important method in today’s world where our maximum work is carried on internet be it communication, reading news, blogs placing reviews about a company, product/software or person. So it becomes very important to detect the exact meaning of the sentence written or else it may lead to disastrous (in many cases completely opposite) understanding of the issue. The essential issues in sentiment analysis are to identify how sentiments are expressed in texts and whether the expressions indicate affirmative (favorable) or negative (unfavorable) perspective toward the subject.[3][4]

Opinion Mining or Sentiment analysis involves creating a system to explore user’s opinions made in blog posts, comments, reviews or tweets, about the product, policy or a topic [6].

Components of Opinion Mining

There are mainly three components of Opinion Mining [7]:

- **Opinion Holder/ source:** Opinion holder is the holder of a particular opinion; it may be a person or an organization that holds the opinion. In the case of blogs and reviews, opinion holders are those persons who write these reviews or blogs.
- **Opinion Object:** Opinion object is an object on which the opinion holder is expressing the opinion.
- **Opinion Orientation:** Opinion orientation of an opinion on an object determines whether the opinion of an opinion holder about an object is positive, negative or neutral.

There are two main types of opinions: *regular opinions* and *comparative opinions*.

Different Levels/ Classification of Sentiment Analysis

In general, sentiment analysis has been investigated mainly at three levels [5].

- **Document level:** At this level is to classify whether a complete opinion document expresses a positive or negative sentiment.
- **Sentence level:** At this level the sentences and determines whether each sentence expressed a positive, negative, or neutral opinion.

Objective sentences - that express factual information from sentences

Subjective sentences - that express subjective views and opinions.

- **Entity and Aspect level:** Aspect level performs fine-grained analysis. Aspect level was earlier called feature level or feature-based opinion mining and summarization.

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Potentiodynamically Synthesis And Characterization Of Polyaniline Thin Films.

Prashant P. Gedam

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RUSA – Centre For Advanced Sensor Technology,
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Abstract :

In the present investigation, we study the electrochemical behavior of polyaniline thin films (PANITFs) which is synthesized by cyclic voltametry on platinum working electrode in three electrode system. During deposition of PANITFs various process parameter viz. concentration of monomer, dopant and scan rate of the cycle were optimized. The surface morphology was characterized by scanning probe technique viz. Atomic Force Microscopy (AFM) shows the thin films of PANI were grown on platinum working electrode.

Keywords : polyaniline thin film, cyclic voltametry, Atomic Force Microscopy.

Introduction:

World is going to developed tremendously due to liberalization, privatization and globalization but at the same time we have to face the some adverse effect of environment on living being. Therefore the researchers from various fields are tryig to developed new materials which is helpful to nurture our nature for our future. Therefore scientist fascinated towards the conducting polymers i.e. polypyrrole [1 - 2], polyaniline [3 - 4] and polythiophene [5] due to its tunable conductivity, low power consumption and ease of synthesis [6 - 9]. Conducting polymer films is synthesize by chemical oxidative polymerization technique [10] with the necessity of good oxidizing agent which can produced a thick films and required very large reaction time to carry out the process. Thin films of conducting polymer is synthesized by electrochemical route [11] which provide short duration of time to carry out the process without oxidizing agents.

Therefore in present investigation keeping the idea of electrochemical polymerization technique PANI thin films were synthesized potentiostatically and deposited on platinum working electrode (vs Ag/AgCl reference electrode). The topographical image of PANI thin film is recorded by Atomic Force Microscopy (Park XE 7). The electrochemical characterization performed by utilizing CH 600C electrochemical work station. A three electrode cell containing platinum plates of dimensions 20 * 5 *0.5 mm³ were used as working & counter electrodes and saturated Ag/AgCl used as reference electrode. In the preparation of electrolyte, aniline monomer distilled twice prior to used and stored in cold environment were purchase from Sigma Aldrich. The reagent used as hydrochloric acid (HCl) of laboratory grade. . In the electrolyte preparation 1 M of HCL is added drop wise with continuous stirring in 0.5 M of aniline for half an hour. This solution was used for electrochemical deposition of PANI thin films on platinum working electrode at room temperature.

Result And Discussion:

PANI thin films were synthesis by cyclic voltametry by sweeping the potential between -1.0 to + 1.0 V for a 10 successive cycles at a scan rate of 50 mV/s. electrochemical polymerization of PANI involves two stage. In first stage PANI grown on the bare electrode shows a compact granular layer. In second stage PANI further grown on the form of granular layer and finally form loosely bound open structure. It is seen that the first oxidation peak is at a potential of 0.3 V can attributed to the formation of emeraldine from lucoemeraldine, wheras the oxidation peak 0.9 V is related to the formation of pernigraniline from emeraldine. Beside, the oxidation process of other impurities was also found at the potential of 0.6 V. reverse reduction process occurs with a peak potential beyond 0.8 V and with a formation of lucoemeraldine from emeraldine and at a potential of 0.2 V is the formation of emeraldine from pernigraniline [12]. The modification in the topographic surface of the substrate after deposition of PANI thin film on working electrode is confirmed by Atomic Force Microscopy (AFM). The AFM topographical image shows the deposition of PANI on the electrode due to the increase surface area of sample.



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**Screening And Evaluation Of Silver Nanoparticles Producing
Bacteria From Lonar Lake, India**

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Department of Microbiology,
Shri. R. L. T. College of Science, Akola

Abstract –

Lonar lake is known for unique microbial diversity, which is located at Deccan Plateau of West-central of India. Water and sediment sample from lake were collected and screened for presence of silver nanoparticle synthesis. All isolates were grown and analyzed on Horikoshi medium B. The antibacterial activity of these crude silver nanoparticles produced by alkaliphilic bacteria were studied against pathogenic bacteria such as Staphylococcus aureus and Escherichia coli. The zone of inhibition shown by isolates code no. W1A, W1B, W1C, and W2B against S. aureus and E. coli was in the range of 20 mm to 28 mm. The zone of inhibition shown by silver nanoparticles is significant in comparison with traditional antibacterial agents.

Introduction –

Lonar Lake (Lonar Crater, Lonar Sarovar) is a notified National Geo-heritage Monument. It is a alkaline lake located at Lonar in Buldhana District, Maharashtra, India. It was created due to a meteor impact during the Pleistocene Epoch (Antony et al., 2010; Kanekar et al., 2012). A British Officer, C J.E Alexander identified it in 1823. Lonar Crater is filled with saline water and the uniqueness of water is its salinity and high alkalinity (Fredriksson et al., 1973). Alkalinity environments show diverse flora of alkaliphilic microbial culture growing at pH 8-10 and some at high salt concentration.

Nanotechnology has become one of the most promising technologies applied in all areas of science. Currently there is growing need to develop an environment friendly nanoparticles synthesis that does not use toxic chemicals in the process of its synthesis. The microbial mediated biological synthesis of metallic nanoparticles has recently been recognized as a promising source for mining nanoparticles. The microbial recovery of precious metals with the formation of their nanoparticles is a green alternative to the conventional method (Gandhi & Khan, 2016).

Materials and methods –

A) Enrichment, Isolation and identification of bacterial isolates – A total three samples (two water and 1 sediment) were collected from different sites of Lonar lake. Enrichment of the cultures were out on Horikoshi media A, B and C respectively (Horikoshi K, 1999). After enrichment, the well isolated and differentiated colonies were transferred on respective medium slants and cultures were maintained as stocks. Isolated Bacillus species were identified by cultural, morphological, biochemical tests.

B) Synthesis, Characterization and Antibacterial activity of crude silver nanoparticles (AgNPs) – Total 8 isolates collected from Lonar lake were sub-cultured in test tube containing 10 mL of nutrient broth containing 3.5 mM AgNO₃. The inoculated broth incubated at dark condition at room temperature for 15 days. After incubation period upon visual observation, the culture incubated in presence of silver nitrate. Along with these the control experiment was also run without AgNO₃. The biosynthesized silver nanoparticles from bacteria isolated from Lonar lake were screened against one Gram – positive and one Gram - negative bacteria such as S. aureus and E. coli respectively. The method used for antibacterial potential was well diffusion method on nutrient agar. Zone of inhibition showed by silver nanoparticles against pathogenic bacteria were measured.

Result and Discussion

In the present study, total three samples comprising of two water and one sediment were collected from different sites of alkaline Lonar Lake, India. In the winter season December 2018. From these samples 8 morphologically different colonies were isolated. Out of these 8 isolates 4 isolates produce significant amount of silver nanoparticles. After synthesis of Agnp's supernatant used for the antibacterial activity.

Table 1 - Zone of inhibition against <i>S.aureus</i> & <i>E. coli</i>					
Sr No.	Culture code	Zone of inhibition showed by Bacterial suspension (mm)		Zone of inhibition showed by Bacterial AgNPs (mm)	
		against <i>S.aureus</i>	against <i>E. coli</i>	Against <i>S.aureus</i>	against <i>E. coli</i>
1	W1A	No zone	No zone	28 mm	20 mm
2	W1B	No zone	No zone	28 mm	20 mm



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SYNTHESIS AND EVALUATION OF ANTIBACTERIAL ACTIVITIES OF BIOGENIC SILVER NANOPARTICLES FROM BACTERIAL ISOLATES OF LONAR LAKE**S.C. Bawane and H.S. Malpani***

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ABSTRACT

Lonar lake is a unique ecosystem formed by meteorite impact, which is located at Deccan Plateau of West-central of India. In the present study, water and sediment sample were collected from different sites of Lonar Lake. All these samples were streak on Horikoshi media B, cultures were maintained as stocks. The pure bacterial isolates were grown in nutrient medium containing $AgNO_3$ substrate for the biosynthesis of silver nanoparticles. The antibacterial activity of these crude silver nanoparticles produced by alkaliphilic bacteria were studied against pathogenic bacteria such as *Staphylococcus aureus* and *Escherichia coli*. The zone of inhibition shown by isolates code no. W1A, W1B, W1C, and W2B against *S. aureus* was found to be 28 mm, 28 mm, 25 mm and 25 mm, and against *E. coli* all 4 isolates shown 20 mm of zone each. The zone of inhibition shown by silver nanoparticles is significant in comparison with traditional antibacterial agents. The 16S rRNA sequencing of these bacterial isolates were carried out. After the 16S rRNA sequencing the studied isolate code W2B, W2C, W1B, W1C were confirmed as *Bacillus cohnii* strain D7048, *Bacillus cohnii* strain GUFBSS253-2, *Bacillus polygami*, *Bacillus sibiralis*, respectively.

Keywords - Biogenic silver nanoparticles, antibacterial activity, Lonar lake.

Introduction

Lonar lake is a unique ecosystem formed by meteorite impact, which is located at Deccan Plateau of West-central of India. Lonar Crater is filled with saline water and the uniqueness of water is its salinity and high alkalinity[1]. Lonar lake harbors diverse microorganisms having potential to produce various biologically active compounds which have potential of pharmaceutical and biotechnological application[2].

Metal nanoparticles produced by nanotechnology have received global attention due to their extensive applications in the biomedical and physiochemical fields [3]. Metals shows antimicrobial potential against the pathogenic microorganisms. The ability of microorganisms to reduce the inorganic metal has opened up an exciting eco-friendly approach towards development of green nanotechnology. The microbial recovery of precious metals with the formation of their nanoparticles is a green alternative to the conventional method[4]. Although silver nanoparticles are widely used in a variety of commercial products. There have been several studies that describe the in vitro toxicity of silver nanoparticles to a variety of different organs, including the lung, liver, skin, brain,

and reproductive organs [5]. Antibiotic resistance is burning problem all over the globe and these bacterial AgNPs shows strong antibacterial activity against pathogenic bacteria [6].

Lonar lake is wonder jewel of the earth. We are blessed to have Lonar crater in our country especially in Maharashtra. Microbiologist have found variety of microorganisms like silver nanoparticles producing bacteria, magnetic bacteria in the lake. The biosynthesis of silver nanoparticles from bacteria which is used as antibacterial agent is cost effective and environmental friendly process.

Materials and methods

A) Enrichment, Isolation and identification of bacterial isolates – Two water and 1 sediment were collected from different sites of Lonar lake. Horikoshi medium A, B & C were used for enrichment of the cultures[7]. Isolated *Bacillus* species were identified by cultural, morphological, biochemical tests. From these three sample morphologically different bacterial isolates were isolated. The bacteria isolated from water were designated as water sample 1 and water sample 2, for water sample 1-W1A, W1B, W1C, for water sample 2 - W2A, W2B, W2C and bacteria isolated from sediment designated as SA and SB.

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PREVALENCE OF BACTERIAL PATHOGENS IN HOSPITAL AIR OF OPERATION THEATRES AND INTENSIVE CARE UNITS AND THREAT OF MDR NOSOCOMIAL INFECTIONS.

Dr. Harish Malpani¹

¹Department of Microbiology, Shri RLT College of Science Akola(MS)

ABSTRACT

Hospitals are the places where people get admitted for remedy for disease or disorder they are suffering for. But is also an environment where infected persons and immuno-compromised individuals congregate. Hospital air quality is important determinant of health of patients. Pathogenic bacteria if present in hospital air then it leads to various hospital acquired infection. Crowded conditions within the hospital and many other factors lead to nosocomial infections. Increasing antibiotic resistance also increases the severity of nosocomial infections. In samples collected from 15 randomly selected hospitals, *K. Pneumoniae* (32.7% and 36.1%), *P. mirabilis* (27.4% and 33.3%), and *S. aureus* (22.1% and 25%) were highest in air samples of ICUs and OTs, respectively. Out of 149 bacterial isolates, 26.17% were found to be resistant to all 12 studied antibiotics (MAR index 1.0). *K. pneumoniae* and *S. aureus* were found to acquire more antibiotic resistance than other studied bacteria and could obscure nosocomial infections.

Key words: - Nosocomial infection, MDR, Hospital air flora,

INTRODUCTION

A hospital is a health care institution providing patient treatment by specialized staff and equipment. Hospitals often but not always, provide for inpatient care or longer-term patient stays. Healthcare is one of India's largest sectors in terms of revenue and employment and the sector is rapidly expanding. The private sector accounts for more than 80% of total healthcare spending in India. Unless there is a decline in the combined federal and state government deficit, which currently stands at roughly 9%, the opportunity for significantly higher public health spending will be limited.⁸

With the large health service infrastructure in India, today the central issue appears to be the quality of its functioning. One of the major concerns of lack of quality culture is often responsible for the adverse effect on the health of hospital visitors as well as of the hospital staff. The chief problem is the possibility of nosocomial infections. Many factors promote infection among hospitalized patients decreased immunity among patients; the increasing variety of medical procedures and invasive techniques create potential routes of infection and the transmission of drug-resistant bacteria among crowded hospital populations, where poor infection control practices may facilitate transmission. Health care setting is an environment where both infected persons and persons at

increased risk of infection congregate.⁴ Patients with infections or carriers of pathogenic microorganisms admitted to hospital are potential sources of infection for patients and staff. Crowded conditions within the hospital, frequent transfers of patients from one unit to another and concentration of patients highly susceptible to infection in one area all contribute to the development of nosocomial infections⁴.

The widespread use of antimicrobials for therapy or prophylaxis is the major determinant of resistance. In some cases Antimicrobial agents are becoming less effective because of resistance. As an antimicrobial agent becomes widely used, the bacteria resistant to this drug eventually emerge and may spread in the health care setting. Increasing antibiotic resistance also increases severity of nosocomial infections. The emergence and spread of resistance are also threatening to create species resistant to all currently available antimicrobial agents. Approximately 20 % of *Klebsiella pneumoniae* infections and 31% of *Enterobacter* species infections in intensive care unit in United States now involve strains not susceptible to higher generation antibiotics⁶.


MATERIALS AND METHODS

In the present study, fifteen most populated hospitals of Akola city, Maharashtra were randomly selected. All the hospitals were given a code in order to hide their identity. Air samples from intensive care units (ICU)

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Evaluation of phytochemical constituents and In-vitro regeneration of *Angelonia angustifolia* (L.): A rich source of secondary metabolites.

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ABSTRACT

In this study, evaluation for the phytoconstituents was carried out. The protocol for callus induction and regeneration in *Angelonia angustifolia* L. was standardized. Young apical leaves and nodes were used as explants for callus induction on Ms Medium containing 2, 4-D and Kinetin, 2, 4-D and BAP, IAA and BAP and IBA and Kinetin in different concentrations. The maximum percentage of callusing was observed on the medium supplemented with 0.5mg/L IBA and 0.5mg/ Kinetin was found to be 100% for leaf & 100% for node explants. The calli in most of the cultures were whitish green and soft in nature. Initiation of shooting of *Angelonia angustifolia* established from leaf explants on MS medium supplemented with combination of hormones IAA 0.4 mg/L & IBA 0.4 mg/L. This study was aimed to develop standard protocol for callus induction, protocol for organogenesis & standardization of media and growth hormonal concentrations, which may helps in conservation and cultivation of this species. This plant is also the ware house of secondary metabolites and therefore callus will be the source of extraction of these many secondary metabolites for the therapeutic drugs.

Keywords: *In-vitro*, Regeneration, Organogenesis, Phytochemicals, *Angelonia angustifolia*..



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Diversity Of Different Butterfly Species In Akola Region, M.S., India

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Abstract

Lepidoptera is an order of insect that includes butterflies and Moth about 180,000 Species of the Lepidoptera are described, in 126 families and 46 Super families, 10% of the total described species of living organism. Among insect, butterflies are the most beautiful and colourful creatures on the earth. Butterflies are very sensitive group to environment and are directly affected by changes in the habitats, atmospheric temperature, and weather conditions. They can be good indicators of environment changes. The present study was started comparatively to examine the diversity of butterflies from Akola city and Natural habitat around Akola. Collected butterflies were photographed. Morphological characters were noted down. Further identification with the help of field guides was done. The total of 20 species of butterflies belonging to five families were recorded during the study period from both the parts of study area. Most of the species were noticeably absent in the disturbed and human impacted sites and there was no occurrence of unique species in moderately disturbed areas comparable to those of less disturbed wild areas.

Key-words: *Butterflies, environment, morphological, habitat, human impacted.*

Introduction

Lepidoptera is an order of insect that includes butterflies and Moth about 180,000 Species of the Lepidoptera are described, in 126 families and 46 Super families, 10% of the total described species of living organism. The Lepidoptera show many variations of the basic body structure that have evolved to gain advantage in life style and distribution. The word Lepidoptera derives from the Latin word for “Scaly wing” and from the Ancient Greek (lepis) meaning scale and (pteron) meaning wing sometimes the term Rhopalocera is used to group the species that are butterflies. Lepidoptera are morphologically distinguished from other orders principally by the presence of scales on the external part of the body and appendages, especially the wings. The scales are modified, flattened “hairs” and give butterflies and moths their wide variety of colours and patterns. Butterflies play an important role in the natural ecosystem as pollinators and as food in the food chain; conversely their larvae are considered very problematic to vegetation in agriculture, as their main source of food is often live plant matter.

Among insect, butterflies are the most beautiful and colourful creatures on the earth, have a great aesthetic value and are called the flying jewels or winged jewels of nature. Butterflies are generally regarded as one of the best and most taxonomically studied groups of insects. The butterflies are a very important unit of ecosystem due to the inter-relationship with plants diversity (Kunte, 2000). Butterflies are very sensitive group to environment and are directly affected by changes in the habitats, atmospheric temperature, and weather conditions. They can be good indicators of environment changes (Tiple et al., 2006). In Central India, the butterfly diversity was reported earlier by Forsayeth (1884) and Betham (1890, 1891). The present study was started comparatively to examine the diversity of butterflies from Akola city and Natural habitat around Akola, since there was no known published checklist of butterflies in the study area.

Methodology:

The study area was divided into two phases as, the natural and green area with trees and flowering plants for nectar and food availability around Akola and the 2nd phase was urban area, the Akola city. The collection of specimens was done from the different habitats of the Akola city as well as natural habitat around Akola city like farms from Patur village, Katepurna Sanctuary, PDKV University and the lakes, dams and rivers during the monsoon and post monsoon seasons. During the study period January 2019 and December 2019 the collection of butterflies belonging to the different families were done. Butterflies were collected from the different Akola regions. Identification of the butterflies observed was mostly made directly in the field. Collection of butterflies will be carried out by visual search in the study area. Specimens were collected with



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Quantification of Urea And Uric Acid in Silkworm *Bombyx Mori* During Grasserie Infection

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Abstract

Grasserie is one of the most serious diseases of silkworms, though occurs throughout the year, its intensity varied with seasons. The pathogenic infections induce biochemical alterations including nitrogenous waste like, Urea and Uric acid in larval tissues. Here we estimated urea and uric acid in non-infected, healthy silkworms and the silkworm infected with Grasserie. At early infection with Grasserie the amount of urea in silkworm midgut tissues was recorded as 6.38 mg % as compared to control healthy 7.34 mg%. While in late infection the amount of urea was 6.78 mg% as compared to non infected control 7.54 mg %. Uric acid in Midgut tissue of silkworm infected with Grasserie in early infection showed non-significant changes, (1.94 mg%) as compared to healthy control was (2.72 mg %). While in late Grasserie infection the amount of uric acids was 1.33mg% and was significant as compared to healthy control in late infection as 2.22mg %. The investigation of chemical changes in body tissues is an appropriate system for studying effects of pathogenic disease. The understanding and identifying these tissue biochemical changes will be very important for discussing many biological stresses. The biochemical responses in silkworm against pathogenic diseases could facilitate the control of agricultural pests.

Key words: Silkworm, midgut, Grasserie, biochemical, alterations.

Introduction:

Though silkworm, *Bombyx mori* is a purely domesticated insect since 4,500 years but like other domesticated animals it is a quite delicate venture and might be easily susceptible to a number of diseases, most of which develops seasonally (Govindan and Devaiah, 1998 and Prasad, 1999). Grasserie is one of the most serious diseases of silkworms, though occurs throughout the year, its intensity varied with seasons. The pathogenic infections induce biochemical alterations including nitrogenous waste like Urea and Uric acid in larval tissues. Study of changes in levels of biomolecular constituents in the body therefore is very important, to get information on the changes in physiological aspects of the quantification of major biomolecules, specifically proteins, carbohydrates, lipids, free amino acids, urea, and uric acids and of the enzymes in the haemolymph and body tissues of a diseased insect are therefore prerequisite for the understanding of the physio-molecular mechanism behind the host pathogen interaction.

Methodology:

The work involved the study of the silkworm larvae with the pathogens of Grasserie and their physiological effects with reference to quantitative changes in major biomolecules urea and uric acid in healthy and Grasserie infected midgut tissue were studied. The quantification was made in the fifth instar larvae, beginning from the newly molted stage (day one) and continued till the 6th day of the instar. The larval period was divided into two chronologically identified state as early experimental stage on day one and late experimental stage on day six of 5th instar. The midgut tissue of the all early and late experimental silkworm were then used to prepare tissue homogenates (20% w/v) in 50 M Tris-HCl buffer (pH 7.0) in a homogenizer. For quantification of major biomolecules and enzyme profile in the midgut tissue, the homogenate was centrifuged at 10,000 rpm and 4°C for 30 minutes. Supernatant was collected and used for quantification of all the major biomolecules and enzymes. So was transferred to new tubes and kept at -20°C until the commencement of experiments.

Considering the benefits of automated analyzers with their internal standards and controls in quantification of Urea and Uric acid, an ELICO Clinical chemistry analyzer CI 162 and prescribed assay kits were used for the quantification. (Hamdah et al., 2010) (Mahesha et al., 2013),



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Variation in Catalase Activity in the Silk Worm, *Bombyx Mori* During, Infection with Bacterial Flacherie

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ABSTRACT

The silkworm is a caterpillar of the domesticated silk moth, *Bombyx mori*. It is a well known economically significant insect as it is a producer of valuable silk. Bacterial Flacherie is a syndrome associated with bacterial Infection, which is the major cause for the affected production of silk in India. Bacterial Flacherie is caused primarily by *Serratiamarcesens*, *Streptococcus sp*, and *Staphylococcus sp* of bacteria. In the present study healthy and bacterial Flacherie infected mulberry silkworm larvae were collected from the local sericulture units, carried and reared in the laboratory. The analysis for the intensity of catalase activity in both controlled and Flacherie infected larval samples were done. We reported, decrease Catalase activity in larvae suffering from Flacherie in comparison with control ones. The observed variation in Catalase activity can be measured of marker for identification of local mulberry silkworm Crops infected with Flacherie pathogen.

KEY WORDS: Bombyx Mori, Catalase, Flacherie, Serretia, Streptococcus, Staphylococcus.

INTRODUCTION

From last 4,500 years, Silkworm, *Bombyx mori* is known as domesticated insect but like other domesticated animals it is also easily susceptible to a number of diseases, results in great economic loss. Diseases like Grasserie and Flacherie are regular and fluctuate season wise in Maharashtra. It is the high temperature and dry climatic conditions of the region, which are conducive to the occurrence of these infections. In *Bombyx mori*, the worms become infected by both bacteria and viruses resulting in bacterial Flacherie and viral. Both Viral and Bacterial Flacherie are frequent and tend to develop in the hot and humid summer and autumn seasons (Lu Yup-Lian and Liu-Fuan, 1991 Mahesha et.al., 2009: Mahalingam et.al., 2010: Mahesha et.al., 2013: Li et.al., 2018).

The prominent pathogens are Streptococci species and Staphylococci species which are responsible for bacterial Flacherie; along with there are *Streptococcus faecalis*, *Streptococcus faecium* as well as *Bacillus thuringiensis*. The bacteria usually go in through mouth along with the contaminated food into the gut and penetrate mid gut wall and make their way to body tissue and haemolymph. Once attacked the bacteria progressively multiplies in the host system causing specific metabolic changes together with related biochemical alteration in the affected body tissues. Such infections are reported to induce variety of biomolecular and physiological changes in insect tissues (Maratignoni, 1964: Shigematsu, 1969). Earlier studies (Kadoya et.al., 1984: Adolkar, 1990: Aboul-Ela, et al., 1991: Gillespie et al., 1997: Doreswamy, et al., 2004: Manohar Reddy 2004: Mahesha et.al., 2009: Mahalingam et.al., 2010: Mahesha et.al., 2013: Recently, Li et.al., 2018 too reported that infected diseases causing great many effects on bimolecular and physiological functioning of the diseased larvae of silkworm they also emphasized the importance of study of these diseases especially the effects are related to, the biochemical composition of body tissues, fluids and enzyme systems. Among antioxidant enzymes, Catalase (EC 1.11.1.6, CAT) is a ubiquitous antioxidant enzyme catalyses the breakdown of hydrogen peroxide into water and oxygen (Switala and Loewen, 2002).

Several organisms in addition to oxidative stress releases catalase to defend themselves against attacks by hydrogen peroxide which forms the host's immune system. Earlier studies demonstrated that a Catalase-deficient mutant infective organism was more susceptible than its wild-type strain to the oxidative stress promoted by H₂O₂ and immune cell attacks (which involve H₂O₂). Thus it may prove helpful in analysing the activity of Catalase of a pathogen,

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Editors Communique

Have we tamed the coronavirus? May be yes,
as pandemics do not die, they can only be faded !

Science and technology has made it possible, in the shortest span of time, it has shown that with firm determination and international cooperation, we can win over the onslaughts of even the worst of the pandemics. COVID-19 is perhaps fading over now, due to our coordinated efforts worldwide. Though we have lost millions, in the two year period, partly due to the mishandling of the viral attacks and somewhat by our own follies and carelessness. Anyway lessons learnt from the past, always make us more stronger and determined. Let us now not relax and work on a better mode, as all is still not well yet. The almost taming of the virus and its cousins have indicated some of the concealed failures, on which we have to focus now. We have to be more vigilant, and even a bit of laxity can spoil the good work done. On societal and governmental parts, utmost care and caution is required on a long term basis.

On behalf of *Bioscience Biotechnology Research Communications*, we falter at words to express our deep sense of solitude and grief on the catastrophic events of the world wide pandemic, spanning over two years now. We pray for the strength to bear this universal calamity and come up with long lasting fortitude to eradicate it soon.

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Sharique A. Ali, PhD

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A Generalized Approach to Male Genital System in Two Spider Species of Genus Neoscona

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ABSTRACT

In the present study, we highlight the male genital system of two locally available species of Neoscona spider. The male genital system in Neoscona spider consist of one pair of very large testes and convoluted vase deferentia which become thicker near the genital opening and fused distally to form the ductus ejaculatories. The genital tract is located ventrally in the ophisthosoma and the testes extend as far as to the spinning apparatus. Parts of testes and the vasa deferentia are bordered ventrally by the ampullate silk glands. The genital system is surrounded by extensions of the midgut gland. Exploring genital structures contribute to future phylogenetic studies as well as will stimulate much needed evolutionary studies of genital organization in spiders.

Keywords *Generalized Approach, Male Genital System, Spider Species, Genus Neoscona*

The order Araneae is large group of animals which is commonly known as spiders. Araneae is subdivided into the ancient Mesothelae (segmented abdomen) and the derived Opisthothelae (unsegmented body). Opisthothelae can be subdivided into two lines, the paraphyletic Mygalomorphae and all true spiders, the Araneomorphae. Araneomorphae makeup 90% of all spiders. Araneomorphae can be divided into a small group, the Haplogyne, and a much larger group, the Entelegyne. Haplogyne have simple reproductive organs (Burger *et al.*, 2006). Entelegyne spiders have more complex reproductive organs (Coddington, 2005) Spiders are web producing and eight legged. Spiders are worldwide distributed except Antarctica, sea and air. Spiders can be easily found in small area, spiders

are of different sizes, colors with different habitat. The pioneering contribution on the taxonomy of Indian spiders is that of European arachnologist (Stoliczka, 1869).

The anatomy of spiders includes many characteristics shared with other arachnids. These characteristics include bodies divided into two segments, eight jointed legs, no wings or antennae, the presence of chelicerae and pedipalps, simple eyes, and an exoskeleton, which is periodically shed. All spiders are capable of producing silk of various types, which many species use to build webs to ensnare prey. Most spiders possess venom, which is injected into prey (or defensively, when the spider feels threatened) through the fangs of the chelicerae. Male spiders have specialized pedipalps that are used to transfer sperm to the female during mating. Many species of spiders exhibit a great deal of sexual dimorphism.

Spiders have separate sexes. Aside from a few exceptions (the water spider *Argyroneta*; Schütz and Taborsky, 2005), the females are larger than the males. Spider reproduction is characterized by many special traits (Eberhard, 2004). For example, spider males evolved a singular method of transferring sperm into the female by exploitation of pedipalps which are modified into secondary copulatory organs. These so called palpal organs are not innervated and lack sense organs as well as muscles possible consequences of this unique genital morphology were recently discussed in a review paper by Eberhard and Huber (2010). The complexity of the palpal organ can reach from straightforward (pyriform) kind as in mygalomorph spiders to extremely organized forms as in most



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Genetic Analysis of Ticks from Livestock of Akola District Maharashtra India

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ABSTRACT

DNA from seven isolates of ixodid ticks was collected from the livestock in and around Akola District Maharashtra India, and was analyzed by RAPD using PCR. Selected three casual primers were used for the study of genetic analysis among different isolates of ixodid ticks. A high degree of genetic polymorphism with a unlike pattern of RAPD profiles for each tick isolate was identified with all these random primers. This variability was also established by similarity coefficient values and dendrogram which were perform using mean RAPD profiles for all the primers between different isolates of ticks. The conclusion suggest existence of a complex genotypic diversity of the ixodid tick in Akola district, first time.

KEY WORDS: TICKS, RANDOM PRIMERS, RAPD, GENETIC VARIABILITY of IXODID TICK, AKOLA.

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Editors Communique

Have we tamed the coronavirus? May be yes,
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Science and technology has made it possible, in the shortest span of time, it has shown that with firm determination and international cooperation, we can win over the onslaughts of even the worst of the pandemics. COVID-19 is perhaps fading over now, due to our coordinated efforts worldwide. Though we have lost millions, in the two year period, partly due to the mishandling of the viral attacks and somewhat by our own follies and carelessness. Anyway lessons learnt from the past, always make us more stronger and determined. Let us now not relax and work on a better mode, as all is still not well yet. The almost taming of the virus and its cousins have indicated some of the concealed failures, on which we have to focus now. We have to be more vigilant, and even a bit of laxity can spoil the good work done. On societal and governmental parts, utmost care and caution is required on a long term basis.

On behalf of *Bioscience Biotechnology Research Communications*, we falter at words to express our deep sense of solitude and grief on the catastrophic events of the world wide pandemic, spanning over two years now. We pray for the strength to bear this universal calamity and come up with long lasting fortitude to eradicate it soon.

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Quality publication is one of the ways to keep science alive, and good journals have a leading role to play in shaping science for humanity! As teachers, we have great responsibilities, we have to advocate our students to accomplish and show them the path to test their mettle in hard times to excel, especially in the post COVID 19 era. Science and its advocates will rise more to the occasion and will soon provide succor to the already grief stricken humanity.

Sharique A. Ali, PhD

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CHROMOSOMAL STUDY OF TWO ARANEAE: ARANEIDAE SPIDERS FROM AKOLA MAHARASHTRA

KEY WORDS: Araneae, Karyotype, Akola, acrocentric chromosomes, Cyrtophora, Neoscona

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ABSTRACT

Spiders (Araneae) appear to be the best studied order, of the class Arachnida concerning Chromosomal aspects. They exhibit great diversity in diploid chromosome numbers. Compared with others Araneidae spiders, chromosomes of the Araneae: spider are less studied. In this study, chromosomes of two Araneidae spiders *Cyrtophora citricola* (Forskål, 1775) and *Neoscona theisi* (Walckenaer, 1841) were observed and studied based on the samples collected from Akola region. The chromosome diploid number and the sex chromosomal system in both the spider species found $2n=(22+X_1X_2X_3)$ and $2n=(22+X_1X_2)$ respectively. Both the spider species shows telocentric chromosomes.

INTRODUCTION

Chromosomal characters have been widely used in studies of the taxonomy and population genetics of spiders. Concepts of spider karyotype evolution are based mostly on advanced and most diversified clade, the entelegyne lineage of araneomorph spiders. Araneidae, a family of the suborder Araneomorphae, comprises 176 genera distributed worldwide (world spider catalogue, 2019). In India it is represented by 28 genera and 163 species (Seema keshwani, et al., 2012). Araneae is one of the best studied order of the class Arachnida concerning cytogenetic study. The 823 (~1.7%) species of the 47,272 taxonomically known spiders are cytogenetically studied from all over the world. The notable features of karyotype is the predominance of unusual multiple X chromosome systems such as $X_1X_2/X_1X_2X_3$ often assigned as X_1X_20 , where indicates the absence of Y chromosome (Kral et al., 2006). The $X_1X_2X_30$, $X_1X_2X_3X_40$ and $X0$ derived from the original sex chromosome system X_1X_20 . Karyotype study of spiders is useful for determination of the cytogenetic relationship regarding evolution among the species.

The chromosomes shows G-bands that are rich with Adenine and thymine (A-T) gives dark band and the heterochromatic region of chromosome are rich with Guanine and Cytosine (G-C) gives light band and stained with Giemsa stain. most of the G-bands of chromosome are located from centromere to the telomere in both the spider species studied. All the chromosomes in spider species showed different banding pattern. Little attention has been paid to the Spiders with reference to their chromosomal study so far, particularly due to their ugliness and anchoretic lifestyle. Hence the present study is carried out to explore chromosomes and genetic aspects in neoscona spiders abundantly found in study area. Here the spider smooth muscle of cephalothoraxes region were harvested and used for the explants culture system. The cells were used to obtain karyotype of the spider species. The homologous chromosome shows similar banding pattern that helped to obtain karyotype in both the spider species. The outcome of the present study will be of use to prepare the database of chromosomal pattern in spiders from India.

MATERIALS AND METHODS

Spiders were collected for the present study in and around Akola district during February 2014 to January 2018. For cytogenetic preparation, the method of Webb et al., (1978), described for embryos, was followed with some modification.

The female spider was disinfected with the 70% ethyl alcohol for 5 minutes. The spider was dissected and muscles tissues were removed out from cephalothorax region by using SSC sodium citrate pH 7. The tissue was washed 2-3 times in the RPMI medium to remove fat bodies. The tissue was taken into few drops of media and broken with sterile bled to get single cells. This cell suspension containing very small tissues explants were transferred to the culture T25 cm² flasks by using sterile dropper and spread over the surface of the culture flasks. Then feeded with 0.5 ml of RPMI medium and transferred to CO₂ incubator at 37°C for 1-2 days. After 1-2 days the cells were feeded with 5 ml of fresh growth medium. For karyotype preparation 0.1 ml of colchicine was added to the flask 1 hr before harvesting of the cells. Then the 1.5 – 2 ml of trypsin EDTA 1 X 100 was added to the culture flask and kept it for incubation for 2 mins. The cells in the flask were aspirated gently with the help of pipette and transferred the solution to the centrifuge tube. The solution was centrifuged at 800-1000 rpm for 8 mins. The supernatant was discarded and pellet was broken by tapping gently with fingers. The hypotonic solution was added into the tube. The tightly covered tubes were kept into the water bath at 37°C for 15 mins. Then the 8-10 drops of fixative was added and mixed gently. Again added 3 ml of fixative and mixed gently. Then again the tube was centrifuged at 800 rpm for 10 mins. The supernatant was discarded and again 5 ml of fixative added and centrifuged at 800 rpm for 10 mins. The process was replaced thrice until the clear pellet was not obtained. Finally the tubes were tightly closed and kept into the refrigerator 25 mins. The cell suspension was dropped onto clean slides in such a way that the drops should not be overlapped, air-dried and stained with Giemsa 3% for 10-15 min then rinsed in distilled water to remove excess Giemsa stain. The best metaphase pictures were photographed with a digital camera system attached to the microscope. The chromosome groups were determined on the slides and their films were photographed. For G-banding, the slides were treated with PBS for 15 min at room temperature. After slides were rinsed distilled water, the slides were treated with 0.1 % trypsin for 1 min. Slides were air dried and stained with 3 % Giemsa. Finally the slides were prepared by mounting with DPX for chromosome counts and karyotyping.

The karyotypes were constructed by pairing chromosomes by using size, banding pattern and centromere position from

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Exploitation of Zinc Oxide nanoparticles as a Humidity Sensors

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Abstract

Zinc oxide nanoparticles were readily synthesized through Co- Precipitation method and dipped in Aluminium chloride (AlCl₃) for 1 & 2 min. Zinc Acetate used as a precursor for preparation. In this present work, samples were prepared by spin coating technique in the form of thin films. The ZnO Nanoparticles were characterized by using X-Ray diffraction and humidity sensing, hysteresis characteristic, electrical dc conductivity, Arrhenius plot and activation energy of nanoparticles material studied.

Keywords : ZnO, nanoparticles, co-precipitation, humidity sensors, electrical dc conductivity.

Introduction

Nanotechnology has quite high impact in developing new classes of materials with enhanced functionality and a wide range of applications [1]. The properties of ZnO include its wide band gap (3.37eV), high exciton binding energy (60meV) [2,4]. Other favourable aspects of ZnO are that it is non-toxic, cheap, relative abundant source materials and chemically stable. [3-6]. ZnO probably has the richest family of nanostructures, 1-D ZnO nanorods are potentially useful for various nano devices such as light emitting diode (LEDs), chemical sensors, solar cells, and piezoelectric devices, because of their high aspect ratio and large surface area to volume ratio ensure high efficiency and sensitivity in this applications. Furthermore, ZnO is bio-safe and biocompatible and may be used for biomedical applications without coating [4-8]. In the present work, ZnO Nano-material dipped under Aluminum chloride (AlCl₃) solution at different time, samples were tested for humidity sensing properties.

Experimental

In the present work, synthesis and structural characterization of ZnO nanoparticles by using liquid phase method with large surface area in short reaction time at room temperature and this method is the simplest, cost effective, eco-friendly method. It is also probed for its effect on nanocrystalline size structure via XRD studies of ZnO nanoparticles. [6]

- **Method of Preparation**

Zinc Oxide nanostructure was synthesized by using co-precipitation method. In order to prepare, 2 g of Zinc Acetate Dihydrate and 8 g of Sodium Hydroxide were weighted using a weighting balance. Then, 10 ml and 15 ml of distilled water were measured by a measuring cylinder. After that, 2 g of zinc acetate dihydrate was dissolved with a 15 ml of distilled water and 8 g of sodium hydroxide was dissolved in a 10 ml of distilled water. The solutions were stirred with a constant stirring for about five minutes each. After well mixed, sodium hydroxide solution was poured to the solution containing zinc acetate with a constant stirring by magnetic stirrer for about five minutes. Then, a burette was filled with 100 ml of ethanol and titrate drop wise to the solution containing both sodium hydroxide solution and zinc acetate. After the reaction, white precipitate was formed. [5]

- **Dipping Method:**

Aluminium chloride (AlCl₃) is the main compound of Aluminium and chlorine. The compound is often cited as a Lewis acid. In the dipping method, we have used Aluminium chloride for the dipping method. We first prepare 0.01 M solution of Aluminium chloride making up 100 ml by pouring 0.013 mg.

As we prepared the 0.01M solution of AlCl₃ then we dipped the thick film of Zinc Oxide for different time parameters. We take 1, 2 minutes dipping and after firing these slides for 1 hour at 500°C finally the two thick films slides for different dipping time is prepared and one thick film taken for pure [7,8]. Series of a sample in which ZnO nanomaterial films were dipped in Aluminium Chloride for different dipping time for 0, 1, 2 minutes samples namely ZS-0, ZS-1, ZS-2 respectively.



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Study of SnO₂ doped Polypyrrole Nanocomposites for AC Conductivity and Dielectric properties**T S Wasnik**Department of Physics, Vidya Bharati Mahavidyalaya,
Camp, C.K.Naidu Road, Amravati, M.S.**R M Agrawal**Department of Physics, Shri RLT College of Science,
Civil Line Road, Akola, M.S.**Abstract**

Nanocomposites of Polypyrrole and Stannic Oxide (SnO₂-PPy) were synthesized by in-situ polymerization in different weight percentages using oxidation method. The structural properties of prepared sample was studied by using X-ray diffraction. The surface Morphology of prepared sample were studied by field emission scanning electron micrograph (FE-SEM). The AC conductivity and Dielectric properties of SnO₂-PPy nanocomposite of various compositions were investigated at different temperatures and frequencies (100Hz–1MHz). It shows that the dielectric constant decreased with increase in frequency and temperature. As the concentration SnO₂ nano particles increases in PPy the AC conductivity increased with frequency. Activation energy for conduction has been also determined. Activation energy of PS3 (60 % ppy + 40 % SnO₂) was maximum among the samples and it is 0.1062 eV, it has increased with increase in frequency and SnO₂ nanoparticles concentration.

Keywords: Polypyrrole, Stannic Oxide; Dielectric constant, AC conductivity

Introduction

Recently, the conducting polymers shows the great importance as this exhibit unique properties such as optical, electrical, thermal and chemical etc. Among these polymers, polythiophene, Polypyrrole (Ppy) received more attention due to its high conductivity and thermal stability [1-3]. Polypyrrole (Ppy) is one of the most striking polymers due to its special transport properties, facile synthesis, higher conductivity and good environmental stability. Polypyrrole has various advantages and applications in batteries, electronic devices, optical switching devices, functional electrodes, sensors etc.[4]. Tin oxide (SnO₂) has become the important functional material due to its large band gap and excellent optical and electrical properties. It can be used as transparent electrode in thin-film solar cells, liquid crystal displays, smart windows and anodes for lithium batteries [5-7]. The composite of SnO₂/polyaniline (PANI) by chemical deposition technique and found that the AC conductivity and dielectric properties was studied

Experimental

All the chemicals used in this study were of GR grade purchased from Sd-fine, India (purity 99.99%). In preparation of SnO₂, 2g (0.1 M) of stannous chloride dehydrate (SnCl₂·2H₂O) is dissolved in 100 ml water. After complete dissolution, about 4 ml ammonia solution is added to above aqueous solution with magnetic stirring. Stirring is continued for 20 minutes. White gel precipitate is immediately formed. It is allowed to settle for 12 h. Then it is filtered and washed with water 2-3 times by using de-ionized water. The obtained precipitate were mixed with 0.27g carbon black powder (charcoal activated). The obtained mixer is kept in vacuum oven at 70°C for 24 h to obtain a dried powder. Then this dry product was crushed into a fine powder by grinder. Now the obtained product of fine nanopowder of SnO₂ was calcinated at 700°C up to 6 h in the auto-controlled muffle furnace (Gayatri Scientific, Mumbai, India.) so that the impurities from products will be completely removed.

• Synthesis of Polypyrrole (PPy)

The Py monomer, anhydrous iron (III) chloride (FeCl₃) and methanol were used as received for synthesis of PPy. The solution of 7 ml methanol and 1.892 g FeCl₃ was first prepared in round bottom flask. Then 8.4 ml Py monomer was added to (FeCl₃ + methanol) solution with constant stirring in absence of light. The amount of Py monomer added to the solution (1/2.33 times of FeCl₃) was in such a way to get maximum yield. The resulting black precipitates are filtered and washed with copious amount of distilled water until the washings are clear. PPy so obtained is dried by keeping in oven at 600°C for 3 h. The synthesized material was characterized by using XRD, SEM.



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Study of DC Conductivity of Polyaniline Doped Zinc Oxide Nanocomposites

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Abstract

Polyaniline doped Zinc Oxide (PANI-ZnO) Nanocomposites were synthesized by chemical route method. PANI-ZnO Nanocomposites were found crystalline in nature, confirmed by X-Ray Diffraction (XRD). The DC conductivity of PANI-ZnO Nanocomposites were found to be increasing with respect to the temperature and with compared to the individual conductivity of PANI and ZnO

Keywords: PANI-ZnO, DC Conductivity, XRD.

Introduction

PANI, a conducting polymer, has increasing scientific and technological interests in the synthesis of a broad variety of promising materials due to its unique electrical and optical properties [1, 2]. PANI is widely used in the area of electrochemical materials, light-emitting diodes, biosensors, chemical sensors, and battery electrodes [3–5]. Recently, extensive research has been focused on the synthesis and potential applications in electronic devices to enhance the electrical properties of PANI [6]. PANI is one of the mostly studied conducting polymer because of its ease of polymerization, environmental stability and electrical conductivity. Recent studies are focused on the study of composites based on conducting PANI/metal nanoparticles for increased mechanical and electrical properties [7].

In this paper, PANI and its nanocomposites with ZnO nanorods were fabricated by in situ oxidative polymerization of aniline monomer with ammonium peroxydisulphate. All these composites have been analyzed using X-ray diffraction (XRD). The variation in *dc* conductivity of these composites was studied as a function of temperature and concentration.

Experimental

• **Preparation of PANI**

To prepare PANI, 0.2 M aniline hydrochloride and 0.25 M ammonium peroxydisulphate (APS) solutions were prepared in distilled water. Both solutions were left to cool for 1-2 h in refrigerator. Pre-cooled APS is added drop wise in aniline hydrochloride solution, maintained at a temperature in the range 0-4°C in an ice bath, stirred for 2 h for oxidization and left for 24 h at rest to polymerize in refrigerator. Next day PANI precipitate was collected on a filter paper and washed with the 200 ml of 1M HCl and acetone till the filtrate became colorless. PANI (emeraldine) hydrochloride powder was dried in air and then in vacuum at 45°C. Polyaniline prepared under these conditions was taken as standard sample.[8]

• **Preparation of PANI/ZnO composites**

The sample of PANI and zinc oxide composite was prepared by adding 0.1 M solution of 20 wt % of zinc oxide (dopant) to 0.2 M aniline hydrochloride (monomer) solution in distilled water. The solution was vigorously stirred for 1 h in order to keep the zinc oxide suspended in the solution. Also 0.25 M ammonium peroxydisulphate (APS) solution was prepared in distilled water. All the solutions were pre-cooled before mixing. The aqueous solution of APS (0.25 M) was added drop wise in the beaker containing the mixed solution of monomer and dopant, maintained at temperature in the range 0-4°C in an ice bath. Then this solution was stirred for 2 h for oxidization and left for 24 h at rest to polymerize in refrigerator. Next day precipitate of the composite of PANI/zinc oxide was collected on a filter paper and washed with the 200 ml of 1M HCl and acetone till the filtrate became colorless. Precipitate of the sample was dried in air and then in vacuum at 45°C. Following this procedure, five different samples of PANI/zinc oxide composites with 20, 40, 60 wt% of zinc oxide were prepared and named as PZ1, PZ2 and PZ3.

• **Preparation of sample:**

Sample code	Composition	Thickness(mm)
PZ1	80 % PANI+10 % ZnO	1.245
PZ2	60 % PANI+40%ZnO	1.379
PZ3	40 % PANI + 60% ZnO	1.441



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Humidity Sensing Properties of ZnO/SnO₂ Doped BaTiO₃ Screen Printed Thick Film Sensor

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Abstract

In this paper ZnO and BaTiO₃ nanoparticles was synthesized by a chemical precipitation method. Structural and compositional characterizations have been done by X-ray powder diffraction (XRD). Sensing material was made in the form of thick film. Surface morphologies of the samples were analyzed using Field Emission Scanning electron microscopy (FE-SEM) for thick film of different molecular weight ratio annealed at 600°C. Further, Water vapour or humidity sensing investigations of these sensing materials were done. Our result indicate that ZnO/SnO₂ doped BaTiO₃ in form of thick film for different molecular weight ratio was most sensitive for humidity in comparison to pristine material under same conditions. The hysteresis plot between increasing and decreasing the RH range of 30–90% Rh and vice versa. The samples resistance of sample BZ-2 decreases 10¹⁰ Ω to 10⁶ Ω in comparison with the pristine materials. The similar change was also observed in sensitivity. The results were re- producible up to ± 77% after 2 months of observations.

Key words: ZnO,SnO₂, BaTiO₃ nanocomposites, Humidity sensor.

Introduction

Humidity, the concentration of water molecules in air, affects various materials used in daily life and industrial processing of drugs, beverages, food, electronic goods etc. High and low humidity affects human beings adversely. Excessive high humidity causes corrosion in metallic components and failure of electronic as well as optical devices [1,2].Semiconducting oxides based humidity sensors has various advantages when compared to other types of humidity sensors, such as low cost, simple construction, small size etc in operating the environment. The metal oxide such as SnO₂ , ZnO, WO₃, TiO₂, BaTiO₃ etc the change in electrical conductivity depends upon the composition of the gas/humidity surrounding them. Therefore, they are used as popular and useful sensing materials for making inexpensive gas/humidity sensing devices [3].

In present study, nanocomposites of ZnO , and BaTiO₃based thick films were prepared by screen printing method and the humidity sensitive properties of the nanocomposites films were investigated and compared with those of the pure films. The variation of resistance was studied as a function of relative humidity.

Experimental

• **Synthesis of zinc oxide (ZnO)**

ZnO Nanoparticle were synthesized by solid state reaction method, using Zinc acetate dehydrate Zn(O₂CCH₃)₂(H₂O)₂, sodium hydroxide as starting materials . In preparation Zinc Oxide (ZnO) 0.2M Zinc Acetate dehydrates was dissolved in 100 ml deionised water was ground for 15 min and then mixed with 0.02 M solution of NaOH with the help of glass rod. The mixed and the solution were kept under constant magnetic stirring for 15 min. and then again it was ground for 30 min. The white precipitate product was formed at the bottom. Then abundant liquid was removed and the product was washed several times with the deionized water and methanol to remove by products. The final products was then filtered and it was kept in a vacuum oven at 80 °C for 4 hrs. so the moisture will removed from the final product. Then this dry product was calcinated at temperature 800 °C for 6 hrs. in the auto controlled muffle furnace (*Gayatri Scientific, Mumbai, India.*) so that the impurities from product will be completely removed and get a final product of ZnO nanoparticles.

• **Synthesis of tin oxide (SnO₂)**

In preparation of SnO₂, 2 g (0.1 M) of stannous chloride dehydrate (SnCl₂.2H₂O) is dissolved in 100 ml water. After complete dissolution, about 4 ml ammonia solution is added to above aqueous solution with magnetic stirring. Stirring is continued for 20 minutes. White gel precipitate is immediately formed. It is allowed to settle for 12 hrs. Then it is filtered and washed with water 2-3 times by using deionized water. The obtain precipitate were mixed with 0.27 g carbon black powder (charcoal activated). The obtained mixer is kept in vacuum oven at 70 °C for 24 hours so that the mixer gets completely in to dried powder. Then this dry product was crushed



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Study on DC Conductivity of PPy-ZnO Nanocomposites

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Abstract

In the present work, the nanocomposites of PPy-ZnO were prepared by chemical oxidative polymerization technique using an anhydrous ferric chloride (FeCl_3) as an oxidizing agent. The prepared samples were characterized via XRD and SEM (Scanning electron microscope) to determine the crystal size and porosity, respectively. Using, screen printing technique, thick films of the samples were fabricated. At room temperature and stepwise increasing temperature, dc conductivity of the samples had been measured and it was found that sample PZ2 has smallest average crystalline size 99.40 nm.

DC conductivity measurement showed nearly linear variation of $\ln(i)$ versus $\ln(V)$, exhibiting ohm's law being obeyed on logarithmic scale. Maximum value of current density, $1.261 \times 10^{-5} \text{ A/m}^2$ for PZ2 (70% PPy + 30%ZnO) sample was obtained from schottky plot, at 400 K. Thus PZ2 sample is best among the prepared samples and its activation energy recorded to be 0.1106 eV.

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HPLC purification technique: synthesis of unsymmetrical thiobarbituric acids



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ABSTRACT

Synthesis of thiobarbituric acids by the reaction of 1,3-disubstituted thioureas and malonic acid in acetyl chloride-acetic acid medium and synthesis of cyclized pyrimidin-7-one by the interaction of 1-(2-hydroxyethyl)-aryl thioureas, with malonic acid in *p*-tolyl sulphonic acid and acetyl chloride-acetic acid medium at room temperature stirring has been reported. The present protocol is highly eco-friendly alternative to existing methods, reduces the excess use of acetyl chloride and purity of all synthesized molecules checked with the help of reverse phase high performance liquid chromatography with photo diode array (PDA) detection at 254 nm with spectral characterization by ¹H, ¹³C NMR, and MS spectra.

1. Introduction

Currently, developments of synthetic methodology have great challenge for organic chemists because active methylene group containing compounds are versatile organic precursors with exceptional chemical reactivity. Organic solvent is play a significant role for the synthesis of such active molecule but utilization of huge amount of organic solvents have adverse effect on human health and environment due to emission of volatile organic compounds (VOCs) [1]. Environmental impact for the use of organic solvents in synthesis can be minimizing by replacing non-hazardous solvents [2, 3]. In this regard, use of unsafe solvents in synthesis can represent an issue of health and environmental hazards, hence safer solvent is good alternative for synthesis of organic compound. Therefore, safe synthetic methods under the principle of green chemistry [4, 5, 6, 7] have been used for organic synthesis. The inexpensive, non-hazardous and efficient synthetic approach in recent time is constantly challenged by expanding environmental concern [8], use of natural fruits, vegetables juice [9] also attracting to research groups. Such materials are examples of biocatalyst and carried out organic reactions like preparation of amides [10], triazole [11], Knoevenagel condensation [12], Biginelli reaction [13] etc.

TBAs have gained considerable attention and their biological scaffold such as antimicrobial, antitubercular [14, 15], antifungal [16], antitumor [17], antidiabetic and antibacterial activities [18]. TBAs are good building block to be use in varied organic transformations as precursor [19, 20, 21, 22]. Hence, large number of efforts are being made to find

out new routes and methodologies for the synthesis of TBAs [23, 24]. In earlier literature, synthesis of thiobarbituric acids by the reaction of malonic ester with urea in sodium alkoxide [25], malonic acid with thioureas in Amberlyst-15 [26], acetyl chloride [27, 28, 29, 30, 31, 32], POCl₃ [32], malonates with thiourea in potassium tert-butoxide [33] and methyl malonyl chloride with thiourea in dry 1,2-dichloroethane [34] have been reported.

Therefore, higher temperature, long reaction time and excessive use of organic solvent has major drawback of the reactions protocol. We wish to report herein very simple, highly expedient, modified and efficient technique for the synthesis of thiobarbituric acids by the reaction of 1,3-disubstituted thioureas and malonic acid with 1:2 proportion of acetyl chloride-acetic acid medium (Schemes 1 and 2).

2. Material and methods

2.1. General method

Melting points were taken in open capillary tubes and are uncorrected. Purity of all newly synthesized compounds checked by HPLC technique using Dionex Ultimate 3000 with PDA detection in reverse phase column phenyl 5 μm, 150 × 4.6 mm, at 254 nm. ¹H (400 MHz) NMR spectra were recorded on a Bruker Advance-II 400 spectrometer from CDCl₃ solution with TMS as an internal reference. Chemical shift are recorded as ppm on the δ scale and multiplicities are described as s (singlet), d (doublet), dd (doublet of doublet), ddd (doublet of doublet of

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Acid catalyzed Knoevenagel condensation of thiobarbituric acid and aldehyde at room temperature

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ABSTRACT

Knoevenagel reactions have been performed by the action of various unsymmetrical thiobarbituric acids containing activated methylene carbon and electron deficient center of aromatic aldehydes using small amount of acetic acid as initiator in ethanolic medium. The present protocol proceeded smoothly on room temperature stirring using ethyl alcohol as solvent with the help of initiator. The work-up procedure is very simple and products have been purified by simple recrystallization. Thus rendering the methodology is good and all synthesized molecules were characterized by ^1H , ^{13}C NMR, and MS spectra.

GRAPHICAL ABSTRACT



ARTICLE HISTORY

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KEYWORDS


Acetic acid catalyst;
aldehydes; Knoevenagel
products; TBAs

Introduction

The Knoevenagel reaction is a condensation between activated methylene carbon and carbonyl compounds in acidic or basic medium. The condensation is catalyzed by a weak base such as an amine and have powerful tool for carbon–carbon double bond formation strategy.^[1] In the past few decades, several Knoevenagel condensation reactions have been promoted under distinct catalysts.^[2,3] However few reports are most prominent on activated methylene carbon in water medium,^[4] or with organo-catalyst,^[5] and In(III) catalyzed using acetic anhydride as promoter.^[6] In fact, to increased electrophilicity or leaving-group ability of aldehydes in the presence of the acid additive could accelerate the Knoevenagel condensation which is further increased polar character due to carbon–carbon double bond network.

The Knoevenagel reaction is the most common synthetic strategy to produce electron deficient carbon–carbon double bond center. It has been widely employed in the preparation of benzylidene derivatives and important intermediates which is used in varied organic transformations. Therefore, alkylated and benzylidene derivatives of thiobarbituric acid have attracted attention of researchers toward medicinal chemistry,^[7–11]

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Aims and scope

Synthetic Communications is a world-leading journal publishing research exploring new methods, reagents, and other synthetic work pertaining to organic chemistry. Papers should provide enough experimental detail to aid chemists in replicating reported reactions. We publish original articles and short, focused review articles discussing topics within synthetic organic chemistry.

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The Role of Technology in Teaching and Learning English

Arun B. Khedkar

Asst. Prof. Shri RLT Science College, Akola

Abstract

20th century underwent a tremendous and unprecedented revolution in each and every sphere of life .Whether it is science , arts, literature, language, culture, or knowledge as a whole adding to the wealth of this planet which is Earth .Even education has become more dynamic, modern, pristine and more effective with the advancement in technology in it. In ancient times language was mostly taught and learnt with the traditional methods like imitation, observation, listening, reading and writing. However these techniques still have their prestigious place in inculcating effective language skills, especially the language like English which is a Global language .With the help of technology teaching and learning English has become easier than ever before. Many teachers prefer teaching English with the help of various technical tools as doing so they can save their time. The use of Language Labs, LCD, LED Projectors, smart phones, computers, laptops, translating machines, online and offline dictionaries, sound recorder, audio as well as video lectures, Technology significantly helps teacher to communicate his message far effectively, making learning English interesting as a international language. Learning English with DVDs, electronic dictionaries and T.V., radio appeals to all our senses as students learn better with the first hand experience .Teachers too find themselves at ease while they interact with students with the help of technology the benefit of learning English with technology is not only confined to classrooms only as you can learn anywhere and anytime making learning English more interesting for students. However students today have a lot of opportunities to practice English through social media, newspapers where they can find a variety of methods by using which language can be learnt which is not always possible within four walls. Unlike reading from the textbooks in a familiar way students use tablets for reading as they can carry it anywhere. What is most technology catches our attention and retains it to longer time.

Introduction:-

Human civilization has progressed rapidly since Stone Age. We passed through Iron Age, Brass age, Copper age, Golden age. Now it is the age of technology. Life has become smoother and smoother as we marched ahead. Earlier we used to communicate through signs and symbols. Slowly and gradually language developed. There are thousands of languages in the world. Number one language spoken in the world is Mandarin language, next to it, is English language. Latin, French etc are widely spoken in their respective country and English is considered as an international language, a link language, a global language because English people has ruled over almost all the countries in the world. Common wealth countries are the best example. Wherever those people went they left their impression there. Asian countries have been influenced tremendously where English is used in Government offices on a wide scale.

England a small island during the progress of civilization has ruled all over the world. Wherever they went they took their language with them. Now English is widely spoken throughout the world and it is second largest language in the world. All trade and commerce are conducted in English. To spread their culture England conducted missionaries and left them the job of spreading their language and culture. Earlier before scientific inventions it was very difficult to reach to grass root level. But now due to advancement in science and technology everything has become easy.

Spread and Reach of English

England's common people spoke the English Language but it has become the language of knowledge. All science and technological books are written in this language. Hence it has become very necessary to learn English. It has become gateway of knowledge.

Various modern tools are available to teach English Language, of which some are 1) Audio –Visual Aids 2) LCD Projector 3) Language Labs 4) Translation machine 5) audio Cassettes 6) Electronic Dictionary.

Language Lab: - Computer plays very important role in language labs. Computers are preloaded with software to teach English, Spanish, German, French etc. Head phones are used to listens standard language. These labs provide a very different experience from the traditional system of teaching and learning languages. They



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Investigation of Visible Quantum Cutting In $KCaF_3:Gd^{3+}, Eu^{3+}$ Phosphor

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Abstract

In this work we prepared $KCaF_3$ Co-doped with Gd^{3+}, Eu^{3+} phosphor synthesis via reactive atmosphere process. Powder X-ray diffraction analysis shows structural purity of as-synthesized phosphor. The emission and excitation spectra of $KCaF_3:Gd^{3+}, Eu^{3+}$ were investigated using the VUV beam line of the Beijing Synchrotron Radiation Facility (BSRF). Here we investigate the mechanism of Energy transfer in Gd^{3+} ions to Eu^{3+} through cross relaxation process. In this phosphor we got negative results. The excitation peak of 273 nm was very much greater than that of the excitation peak of 147 nm at emission wavelength 593 nm. Hence there was no energy transfer in between the ions Gd^{3+} and Eu^{3+} . The results was no quantum cutting in the given phosphor material.

Keywords: Reactive Atmosphere Process (RAP), Quantum cutting (QC), Vacuum Ultraviolet (VUV)

Introduction

For the development of mercury free florescent lamps and plasma display panels (PDPs), we require phosphor having quantum efficiency is greater than unity under VUV excitation. The phosphors having quantum efficiency is greater than unity are called quantum cutting phosphors. Quantum cutting provides a means to obtain two or more low energy photons for each high energy absorbed photon. Therefore it serves as a down converting (DC) mechanism with quantum efficiency greater than unity and it offers the prospect of providing enhanced energy effectiveness in lighting devices [1]. Calcium fluoride with rare earth doped phosphor has conventional attention for numerous research works [2]. B. Herden *et al.* reported photon cascade emission in Pr^{3+} doped fluorides with CaF_2 structure [3]. W. Binder *et al.* reported $CaF_2:Sm^{3+}$ Phosphor was used for the application of solid state laser materials [4]. R. Wegh *et al.* explain detail about visible quantum cutting through down-conversion in rare-earth compounds [5]. B. Liu *et al.* also explain visible quantum cutting in $BaF_2: Gd; Eu$ via down-conversion in which one VUV photon absorbed by Gd^{3+} can be split into two visible photons emitting by Eu^{3+} through cross relaxation between Gd^{3+} and Eu^{3+} [6].

Experimental

$KCaF_3: Gd^{3+}, Eu^{3+}$ phosphor was synthesis via reactive atmospheric process. In this method we used metal nitrate like $Ca(NO_3)_2$ (99.99% A.R.) and potassium nitrate KNO_3 as a precursor. The above both inorganic precursors were taken in Teflon beaker. A little amount of double distilled water was added in beaker and stired it, then hydrofluoric acid (HF) added in it to get slurry. The slurry was dried by blowing air or heating on hot plate (80°C). A freshly prepared $KCaF_3$ host was obtained. Gd_2O_3 (AR 99.9%) and Eu_2O_3 (AR 99.9%) were boiled in HNO_3 and evaporated to dryness, so as to convert them into relevant nitrates. The aqueous solution of these nitrates where use as a dopants. The 1 mol% of gadolinium nitrate and 1mol% of europium nitrate where assorted in the host material and dehydrated completely.

The dried powder was transferred to a glass tube and about 1.0 wt. % RAP agent was added. In this process we used ammonium fluoride as a RAP agent. The tube was closed with a tight stopper and slowly heated to 500°C for 3 h. The stopper was removed and the powders were transferred to a graphite crucible pre-heated to a suitable temperature. After heating in the graphite crucible for 1 h the resulting phosphor was rapidly quenched to room temperature. Belsare *et al.* well discussed about RAP in their literature [7]. The complete process involved in the reaction was represented as a flow chart in Fig. 1.



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Studies on Dental Health Status to Correlate Between Detrimental Food Habits and Oral Hygiene: A Questionnaire Based Survey

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Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Oral health and hygiene have a synergistic complementary relationship. Oral infectious disease as well as acute, chronic and systemic oral manifestation impact the functional ability as well as diet and nutrition too.

Effective plaque control, Regular oral checkups and good hygiene practices is the foundation of any attempt to prevent and control tooth decay and many periodontal diseases. Common oral problem in all the age group is dental Carries due to bacterial accumulation or Biofilm formation with cause of 43% tooth loss in children and adolescence between age of 6- 19 years. The study was designed to evaluate the oral health status along with oral hygiene level in individuals with or without various detrimental food habits.

A questionnaire based survey was carried out among healthy as well as dental patients visiting to dental care clinic in Akola region. Questionnaire included questions

regarding oral hygiene practices and perception about relationship of oral health with detrimental habits. In present study of total participants n=288, participation of female participants was 61.55% (n=177) and remaining 38.5 % (n=111) was of male participants. In this study the opinion survey was made regarding the probable reasons for tooth decay. Improper brushing as the major cause of tooth decay was reported by 25.7% (n=74) while 23.6% (n=68) attributed it to the consumption of high sugar content, 14.9 % (n=43) opined improper diet as the reason for tooth decay, likewise 12.2% (n=35) reported dental treatment apathy or anxiety responsible for it, likewise 6.9% (n=20) held addiction of tobacco as the reason for tooth decay, whereas 16.7% (n=48) reported other factors like age were responsible for tooth decay.

Awareness particularly regarding the frequent use of brushing, gargling, use of mouth wash etc. along with

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<p align="center">DR. RAJESH D. CHANDRAWANSHI</p> <p align="center">Director of Physical Education and Sports Shri R.L.T. College of Science, Akola</p>	<p align="center">STRENGTHEN IMMUNITY FOR COVID-19 PANDEMIC PERIOD</p> <p>ABSTRACT <i>In this critical and pandemic period of Covid-19 everybody is facing a problem related to save the life. The world is suffering from this Coronavirus and everybody knows very well that no medical aid is available against this disease. Everyone has own internal Immunity power which is protective and supportive to fight against this Coronavirus disease. It is most important to strengthen our immunity to survive against this disease. Immunity is a power which protects us from diseases. In this Covid-19 pandemic situation outdoor sports and physical activities are not possible due to social distancing. Immunity depends on health and health is inter-connected with physical fitness. Physical fitness is your ability to carry out tasks without undue fatigue. Immunity, Health and Physical Fitness are inter-connected. Due to social distancing it is a better way to develop physical fitness at home for health and maintain or boosting immunity.</i></p> <p>Key words: Immunity, Physical Activity, Physical Fitness, Covid-19.</p>	
<p>Introduction</p> <p>In this critical and pandemic period of Covid-19 everybody is facing a problem related to save the life. Below 7 year and above 65 year of age, it is very difficult to survive due to effect of Coronavirus disease. The scientists are taking so much pain and hard work to make a vaccine but there is no confirm date to launch vaccine of Coronavirus disease. The world is suffering from this Coronavirus and everybody knows very well that no medical aid is available against this disease. Everyone has own internal Immunity power which is protective and supportive to fight against this Coronavirus disease. It is most important to strengthen our immunity to survive against this disease. How to strengthen own immunity with the help of scientific research and physical practice based activities it is also most important topic.</p> <p>Immunity</p> <p>Immunity is a power which protects us from diseases. Immunity is a super power which is gifted or in built in human being since from his birth. Immunity is a power against Virus, Bacteria and Diseases. Without Immunity human cannot live. Immunity is an internal</p>	<p>defensive power which is affected from various factors. These factors are as follows.</p> <p>Age</p> <p>Below the age of 7 years and above age of 65 years immunity is weak. In this age group infection from bacteria and virus or any diseases are infected to body easily. So everybody can take precautions for safety of his life. As life span was increased due to medical facilities is available for mankind.</p> <p>Heredity</p> <p>Due to genetic problems and low immunity power of parents a cause of weak immunity in child at the time of his birth. In this condition immunization is useful to maintain or increase the immunity of weak child.</p> <p>Physical Activity</p> <p>Proper function of human body parts is based on continuous working, functioning and action in movement. Physical activity is stopped in that condition proper functioning of parts is uneven and diseases are created in your body. Immunity power is continuous struggling with various diseases so it automatically decreases so this situation is dangerous for our life. Physical activities increase physical fitness.</p>	
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Synthesis of triazine linked pyrazole heterocyclics by conventional heating and microwave irradiative cyclocondensation and evaluation of antitubercular and antimicrobial potential

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The synthesis of (4-benzylideneamino-6-methyl-[1,3,5]-triazin-2-yl)-(5-methyl-2-substituted phenyl/*H*-pyrazol-3-yl)-amines and (4-benzylideneamino-6-methyl-[1,3,5]-triazin-2-yl)-(5-methyl-2-substituted benzoyl/isonicotinoyl/cinnamoyl-pyrazol-3-yl)-amines by conventional heating and microwave irradiative cyclocondensation have been achieved by the cyclisation of *N*-(4-benzylideneamino-6-methyl-[1,3,5]-triazin-2-yl)-3-oxo butyramide with substituted hydrazines and acid hydrazides. The required butyramide has been synthesized by the reaction of 2,4-diamino-6-methyl-[1,3,5]-triazine with benzaldehyde followed by the condensation with ethyl acetoacetate. Structural elucidation of synthesized compounds has been performed by IR, ¹H NMR and mass spectral studies besides chemical transformation and elemental analysis. The title compounds have been evaluated for their antitubercular and antimicrobial potential against some selected microorganisms to establish the structure activity relationship.

Keywords: Triazine-pyrazole, conventional, microwave, antitubercular, antimicrobial

The synthesis of organic compounds by microwave irradiation technique has number of advantages over the conventional heating¹. High density microwave irradiation technology has emerged as a reliable and useful methodology for accelerating the time consuming reactions². It can be used for high speed parallel synthesis of number of biologically active molecules³. In synthetic organic chemistry, pyrazole is widely exploited pharmacophore having different practical applications in the medicinal and agrochemical field^{4,5}. Pyrazole ring system has been consistently rewarded as a promising molecule, as its activity covers the domains such as antipyretic⁶, antimicrobial⁷, antitumor⁸, antidepressant⁹, antitubercular^{10,11}, analgesic¹², ulcerogenic¹³, antiinflammatory¹⁴, anticonvulsant¹⁵, antihistaminic¹⁶ and anticancer¹⁷. Pyrazole fused heterocyclics have been widely used in pesticides and medicines¹⁸. On perusal of literature, it was observed that position N-1, C-3, C-4 are much important for the studies of structure activity relationship and C-3 should be linked to different heterocyclics for better chemotherapeutic activities¹⁹. All these observations encouraged us and developed interest in synthesizing triazine linked to pyrazoles at C-3 position. Presence

of two bioactive rings within a single molecule enhances the antimicrobial activity profile and hence synthesis of triazine linked pyrazoles has been carried out both by conventional heating and microwave irradiative cyclocondensation for the purpose of comparison.

Most explored method for synthesis of pyrazoles is the reaction of 1,3-dicarbonyl, ester, oxo-amide, hydrazine hydrate using suitable catalyst^{20,21}. The double nucleophilic character of hydrazine for reaction with each carbonyl group of 1,3-diketone needs high temperature and long reaction time²². Therefore, we reported herein synthesis of (4-benzylideneamino-6-methyl-[1,3,5]-triazin-2-yl)-(5-methyl-2-substituted phenyl/*H*-pyrazol-3-yl)-amines **3a-g** and (4-benzylideneamino-6-methyl-[1,3,5]-triazin-2-yl)-(5-methyl-2-substituted benzoyl/isonicotinoyl/cinnamoyl-pyrazol-3-yl)-amines **5a-f** by conventional heating without using any catalyst and compared with the microwave irradiative cyclocondensation. So as to establish the structure activity relationship, all title compounds were evaluated for their antitubercular and antimicrobial potential against some selected microorganisms.



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Synthesis of pyrimidine linked pyrazole heterocyclics by microwave irradiative cyclocondensation and evaluation of their insecticidal and antibacterial potential

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The compounds (4,6-dimethyl-pyrimidin-2-yl)-(5-methyl-2-substituted phenyl/*H*-pyrazol-3-yl)-amines and (4,6-dimethyl-pyrimidin-2-yl)-(5-methyl-2-substituted benzoyl/isonicotinoyl-pyrazol-3-yl)-amines have been synthesized by microwave irradiative cyclocondensation of *N*-(4,6-dimethyl-pyrimidin-2-yl)-3-oxo butyramide with substituted hydrazines and acid hydrazides respectively. The required butyramide has been synthesized by the condensation of 2-amino-4,6-dimethyl pyrimidine with ethyl acetoacetate under microwave. The pyrimidine linked pyrazol-3-yl amines on acylation afforded mono/di-acetyl derivatives. Structural elucidation of synthesized compounds has been performed by IR, ¹H NMR and mass spectral studies besides chemical transformation and elemental analysis. Title compounds have been screened for their insecticidal activity against Pseudococcidae insects and evaluated for antibacterial potential against some selected microorganisms to establish the structure activity relationship.

Keywords: Pyrimidine-pyrazole, microwave, insecticidal, antimicrobial activity

The microwave irradiation technique has number of advantages over the conventional heating in synthesis of organic compounds¹. High density microwave irradiation technology has emerged as a reliable and useful technique for accelerating the time consuming reactions² and it can be used for high speed parallel synthesis of number of biologically active molecules^{3,4}. Several pyrazole derivatives are well established in the literature. The activity of pyrazoles covers domains such as antimicrobial, antiviral, anticonvulsant, antidepressant, antitubercular and antihistaminic⁵⁻⁸. Literature also reveals excellent analgesic and anti-inflammatory activity associated with pyrazole nucleus^{9,10}. It is observed that pyrazoles linked with different heterocyclics are known to contribute to various chemotherapeutic effects. In addition, some pyrazole derivatives were reported to induce various antileukemic, antitumor and antiproliferative activities¹¹⁻¹⁴. Investigations in chemistry and pharmacology of pyrazoles have been highly intensified with the recognition that they constitute essential pharmacophore. Research also reveals good about insecticidal property associated with pyrazole chromophore^{15,16}. Wide range of chemotherapeutic activities has been ascribed to pyrimidine ring as well⁷.

On perusal of literature, it was observed that position N-1, C-3, C-4 are much important for the studies of structure activity relationship and C-3 should

be linked to different heterocyclics for better chemotherapeutic activities¹⁷. With relevance to all these observations our efforts are directed towards the synthesis and study of pyrimidine linked pyrazoles at C-3 position. We report herein, the synthesis of pyrimidine linked pyrazol-3yl amines and their mono/di-acetyl derivatives by microwave irradiation. Title compounds have been screened for their insecticidal activity and evaluated for antibacterial potential.

Results and Discussion

The compound *N*-(4,6-dimethyl-pyrimidin-2-yl)-3-oxo butyramide **1** was prepared by the condensation of 2-amino-4,6-dimethyl pyrimidine (0.01 mol) with ethyl acetoacetate (0.01 mol) under microwave irradiation in solvent free condition. The compound **1** was then treated with substituted hydrazines **2a-f** (0.01 mol) under microwave in ethanolic medium to afford (4,6-dimethyl-pyrimidin-2-yl)-(5-methyl-2-substituted phenyl/*H*-pyrazol-3-yl)-amines **3a-f**. The amines **3a-f** were acylated using acetic anhydride and acetic acid to afford mono/di-acetyl derivatives **4a-f**. The reaction of 2-amino-4,6-dimethyl pyrimidine (0.01 mol) with ethyl acetoacetate (0.01 mol) was further extended by reacting the product *N*-(4,6-dimethyl-pyrimidin-2-yl)-3-oxo butyramide **1** with substituted acid hydrazides **5a-d** (0.01 mol) under microwave in ethanolic medium



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**NON-AQUEOUS POTENTIOMETRIC ANALYSIS OF DRUG
ACECLOFENAC IN BULK AND SINGLE COMPONENT
PHARMACEUTICALS****Dr. Pradip P. Deohate**

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Abstract

Non-aqueous potentiometric analysis of drug aceclofenac in bulk and single component pharmaceuticals was worked out using the solvent isopropyl alcohol and the titrant KOH in isopropyl alcohol. The effect of solvent and concentration on potentiometric analysis of drug aceclofenac and its analysis in bulk and single component pharmaceuticals has been carried out using glass-calomel electrode pair. This method was observed to be simple, precise and produced results comparable to Indian Pharmacopoeia (I.P.) method.

Keywords

Non-aqueous, potentiometric, analysis, drug, aceclofenac

Introduction

Non-aqueous potentiometric analysis of different drugs using various electrode pairs was reported earlier¹⁻⁶. Various methods are reported in the pharmacopoeias for the determination of drugs⁷⁻⁹. In literature, numbers of methods for the determination of drug aceclofenac are reported¹⁰⁻¹². Its spectrophotometric and chromatographic analysis has been reported earlier by some workers^{13,14}. Aceclofenac is distinctly acidic and due to its easy hydrolysis it could not be titrated directly with aqueous alkali. Also, the basic titrant is also superior to the alkoxide solvents, which are more susceptible to atmospheric moisture as well as carbondioxide. The aim of given work is to find out easy and simple method of analysis for pharmaceutical drugs. It will help to analyze raw materials and products for speedy check of spurious pharmaceutical drugs that are feared to penetrate the markets. In this paper, non-aqueous potentiometric analysis of drug aceclofenac in bulk and single component pharmaceuticals using the solvent isopropyl alcohol and the titrant KOH in isopropyl alcohol is reported. The effect of solvent and concentration on potentiometric analysis of drug aceclofenac has also been studied.

Results and Discussion**Effect of solvent and concentration on analysis of drug aceclofenac**

In this study, accuracy of results in non-aqueous potentiometric analysis of drug aceclofenac using different solvents was checked by performing titrations. The required volumes of stock solutions of drug aceclofenac in different solvents were diluted to 20 ml and separately titrated with KOH in isopropyl alcohol. It was observed that, accuracy of result in analysis of aceclofenac using solvent isopropyl alcohol is very good with minimum % error in comparison to other solvents (**Table 1**). The potentiometric break obtained using solvent acetone is smoother one as compared to methanol whereas using isopropyl alcohol it is much more pronounced and prominent with too much potential difference near the equivalence point (**Graph 1**). The dielectric constant of solvent isopropyl alcohol is smaller than solvents methanol and acetone. It permitted a large change in the solvated proton

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A NOVEL INVESTIGATION OF NANOPARTICLES GLUCOSE PENTA ACETATE AND THEIR COMPARATIVE STUDY.**K. M. Kalange¹, A. G. Sarap² and P. T. Agrawal³**Department of Chemistry, Shri R. L. T. College of Science, Akola.
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ABSTRACT

In recent years, nanotechnology is an escalating field of modern research involving in synthesis design, characterization, production, and application of structures, devices, and systems by controlling shape and size at the nanometer scale. Nanotechnology also involves the synthesis of nanoparticles. These compounds arouse interest as potential biologically active substances and versatile intermediates for preparing various derivatives. To achieve the principle of green chemistry process, it leads to in search of green synthesis of nanoparticles. Here we have synthesized Glucosyl PentaAcetate using glucose and acetic anhydride in the presence of perchloric acid. The identities of newly synthesis compounds have been established based on usual chemical transformation and U.V, SEM, TEM Analytical studies.

Keywords: *Glucose, Acetic Anhydride, and Glucosyl PentaAcetate***Introduction**

The field of nanotechnology is one of the most active research areas in modern materials science. Nanoparticles exhibit new or improved properties based on specific characteristics such as size, distribution, and morphology. There have been impressive developments in the field of nanotechnology in the recent past years, with numerous methodologies developed to synthesize nanoparticles of particular shape and size depending on specific requirements. New applications of nanoparticles and nanomaterials are increasing rapidly.

Nanotechnology, as defined by size, is naturally very broad, including the field of science as diverse as surface science, organic chemistry, molecular biology, semiconductor physics, energy storage, microfabrication, molecular engineering, etc. The associated research and applications are equally diverse, ranging from extensions of conventional device physics to completely new approaches based upon molecular self-assembly, from developing new materials with dimensions on the nanoscale to direct control of matter on the atomic scale. Nanotechnology may create many new materials and devices with various applications, such as in Nanomedicines, Nanoelectronics, and biomaterial energy production and consumer products.

Lipid-based Nanocapsulation systems are useful in the properties of antioxidants. It enhances the performance of antioxidants just by improving their solubility. Antioxidants protect our body against age-related, and chronic deceases. When antioxidants are given in their free form, they cannot pass cell membranes, so can easily be cleared from the general circulations reason behind the usefulness of nanocapsulation.¹

Carbohydrates are an important, abundant, and a fundamental class of biomolecules containing Carbon, Hydrogen, and oxygen. The old view on carbohydrate as a natural energy source (starch and glycogen) and structural material (e.g., cellulose, collagen, proteoglycans, and DNA backbone) have expanded, and it is a fact that the role of carbohydrate is much more sophisticated and complex. Today carbohydrates are known to have a variety of functions in mammal¹⁻⁵. Carbohydrates play an essential role in a vast array of biological processes, and mainly there are many advantages; for example, carbohydrate-based drugs show low toxicity and immunogenicity⁶. Thus because of biological importance, carbohydrates have aroused much interest in synthetic and medicinal chemistry^{7, 8}.

Carbohydrates derivatives have been extensively investigated, including synthesis, characterization, and biological activity. Partly due to the fact that many naturally occurring saccharides and synthesized analogs exhibit

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NANOPARTICLES OF LACTOSYL THIOCARBAMIDES : SYNTHESIS AND CHARACTERIZATION

S. C Zyate¹ and P. T Agrawal²
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ABSTRACT

The study includes the synthesis of nanoparticles of Lactosylthiocarbamides and its derivatives. It appeared interesting to carry out the synthesis of nanoparticles of following Lactosyl thiocarbamides by the reaction of Lactosyl isothiocyanate and aryl amines. The characterization of new N- lactosides and biologically made nanoparticles has been carried out by usual chemical transformation, NMR, IR and Mass spectral studies and the characterization of prepared nanoparticles were done by X-ray diffraction, U. V. spectroscopy, melting point difference and antimicrobial activity.

Keywords : Thiocarbamides, nanoparticles, lactose

Introduction

Carbohydrate nanoparticles provide excellent platform for studying carbohydrate-mediated biological interactions at the molecular level. Because of their high surface area to volume ratio in comparison to other micrometer sized counterparts, nanoparticles allow greater contact surface area capable of producing higher capacity receptor binding. Highly reactive nature of *N*-linked sugar isothiocyanate and isocyanate appears to promise its great applicability in the synthesis of thiocarbamates and carbamates which find the wide spread use in the combinatorial library synthesis as well as in pharmaceutical industries. Isothiocyanates and isocyanates are a group of very reactive chemical compounds. Once they have reacted, the resulting product is usually less harmful than the chemical itself. This chemical is used in the manufacture of carbamates and thiocarbamates. Due to high reactivity towards compounds containing active hydrogen atom isocyanates and isothiocyanates are one of the most versatile classes of functional groups. They are important intermediates; the chemistry of these molecules is dominated by the nucleophilic addition reaction. The high yields and lack of byproducts with this type of reaction have led to their commercial exploitation in the polymer field, agrochemicals and pharmaceuticals. Reactions with carbon nucleophiles provide a useful synthetic access to substituted amides and other derivatives.

Sugar isothiocyanates rank among the most versatile synthetic intermediates in carbohydrates chemistry¹⁻³. They play a vital role in the preparation of a broad series of functional groups such as thioamides⁴, isonitrile, carbodiimide and *N*-thiocarbonyl derivatives⁵⁻⁷ allowing, simultaneously, the covalent coupling of a quite unrestricted variety of structures to the saccharide part. More over, isothiocyanates are important reagents in heterocyclic chemistry⁸⁻⁹ which may be exploited in the synthesis of nucleosides¹⁰ and other *N*-glycosyl¹¹⁻¹² structures.

Experimental

Determining the difference between melting point of compounds and their nanoparticles is one way to test if the nanoparticle is prepared or not. So the M.P. of compounds and their nanoparticles has been taken using melting point apparatus. The prepared Compounds and their nanoparticles have been screened for antimicrobial activity using Cup plate agar diffusion method. By measuring zone of inhibition in mm antimicrobial activity has been studied. By using DMSO as a solvent the concentration of compound were 1 mg/ ml. Amikacin (100 µg/ml) was used as a standard. Compounds were screened for antimicrobial activity against microbes (listed in table 2) in nutrient agar medium. ¹H NMR data of the compounds were measured using CDCl₃ solvent on 300 MHz frequency. And their chemical shift values are in (ppm) units using

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**SYNTHESIS AND CHARACTERIZATION OF NANOPARTICLES OF
MALTOSYLATEDTHIOCARBAMIDES AND DERIVATIVES****N. V. Awajare¹ and P. T. Agrawal²**

Shri. R.L.T. College of Science, Akola

Poonamagrawal2575@rediffmail.com

ABSTRACT

On the basis of experiences gained recently from work being carried out in the laboratory on the N-linked sugar isothiocyanate and isocyanate, it appeared quite interesting to carry out the synthesis of nanoparticles of new N-linked Maltose Thiocarbamides and their derivatives by the reaction between Maltosylisothiocyanate and various aryl amines. The characterization of new N-Maltosydes and biologically made nanoparticles has been carried out by Melting point, antimicrobial activity, usual chemical transformation, NMR, IR and Mass spectral studies.

Keywords : Maltose, Thiocarbamides, Nanoparticles,

Introduction

Nanoparticles play very important role in the development of novel diagnosis methods and in the advanced design of drug delivery system^{1,2}. Silver nanoparticles and Gold nanoparticles particularly, shows an excellent anti-microbial properties and hence are rapidly being used in to medicines etc. to increase the lifestyle of human being and beneficial for mankind and environment^{3,4}. Glyco-nanoparticles shows several advantages such as their synthesis can be performed under biomimetic conditions result in nanoparticles without traces of chemicals responsible for adverse cellular responses and carbohydrates which are on the surface can act as targeting molecules and trigger cellular uptake via specific receptors or mediate specific cellular responses⁵. Day by day the field of carbohydrates becomes widely spreading because of its enormous interactions and cell-cell recognition, cell growth, fertilizations and immune responses. Derivatives of Carbohydrate have been reported as inflammatory, analgesic, fungicidal, herbicidal & pesticide agents⁶⁻⁸. Because of the tremendous biological importance, carbohydrates are very essential to our daily lives. They have more importance in synthesis and medicinal chemistry^{9,10}. Maltose is the second member of an important biochemical series of glucose chains. Maltose, or malt sugar, is a disaccharide formed from two units of glucose joined with an α (1 \rightarrow 4) linkage. Maltose is not common in food, but can be formed from the digestion of starch and

is heavy in the sugarin malt, the juice of barley and other grains. Nanotechnology as defined by size is naturally very broad, including field of science as diverse as surface science, organic chemistry, molecular biology, semiconductor physics, energy storage, micro fabrication, molecular engineering etc.

Isothiocyanates and isocyanates are a group of very reactive chemical compounds. Once they have reacted, the resulting product is usually less harmful than the chemical itself. This chemical is used in the manufacture of carbamates and thiocarbamates. Due to high reactivity towards compounds containing active hydrogen atom isocyanates and isothiocyanates are one of the most versatile classes of functional groups. They are important intermediates; the chemistry of these molecules is dominated by the nucleophilic addition reaction. The high yields and lack of byproducts with this type of reaction have led to their commercial exploitation in the polymer field, agrochemicals and pharmaceuticals. Reactions with carbon nucleophiles provide a useful synthetic access to substituted amides and other derivatives.

Experimental

The prepared Compounds and their nanoparticles have been screened for antimicrobial activity using Cup plate agar diffusion method. By measuring zone of inhibition in mm antimicrobial activity has been studied. By using DMSO as a solvent the concentration of compound were 1 mg/ ml. Amikacin (100 μ g/ml) was used as a standard.

The screenshot shows the Web of Science Master Journal List interface. At the top, there are navigation links: Master Journal List, Search Journals, Match Manuscript, Downloads, and Help Center. There are also buttons for Login and Create Free Account. A search bar contains the ISSN 2319-4979, and a search button is visible. Below the search bar, it says "Search Results" and "Found 1 results (Page 1)". The search results section is titled "Exact Match Found" and displays the journal details for VIDYABHARATI INTERNATIONAL INTERDISCIPLINARY RESEARCH JOURNAL. The publisher is listed as SSSKR INNANI MAHAVIDYA, KARANJA LAD, WASHIM, INDIA, MAHARASHTRA, 00000. The ISSN / eISSN is 2319-4979. Additional Web of Science Indexes include Zoological Record. There are buttons for "Share This Journal" and "View profile page".

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Study Of Phytoplankton Of Lake Bhivapur, Tq.-Tiwasa, Dist. Amravati

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Abstract: Phytoplankton which are present were in natural water bodies of Bhivapur lake were studied. Phytoplankton such as Chlorophyceae, Cynophyceae, Bacillariophyceae, were studied during year 2019-20. In present investigation, above phytoplankton were the indicators of waer pollution.

Keywords: Phytoplankton, Chlorophyceae, Cynophyceae, Bhivapur.

1. INTRODUCTION:

Phytoplanktons were studied from Bhivapur lake ,Taq.-Tiwasa, Dist- Amravati, this is small lake and having different types of phytoplanktons . Because of presence of phytoplanktons, there are changes of ecological status of lake Bhivapur. Some phytoplanktons like, Chlorella, Nitzschia, Synedra which are the parts of Palmers list of sixty more pollution tolerant genera in the world (Palmer, 1969). Most of the worker studied the periodicity and the distribution of algae in Indian fresh water bodies. Important contribution are Khan (1992), Singh et al; (1998),Walawalkar et al (1999), Pullae (2000), More and Nandan (2000) and Angadi (2003). Present study of Phytoplankton species of Bhivapur lake were studied to find out water pollution of Bhivapur lake.

2. MATERIAL AND METHODS:

For phytoplankton analysis, samples were collected a period of one year from June- 2019 to May 2020. Planktons were collected from water samples in two liter plastic can and some crystals of iodine after 24 hours, 10 ml sedimented water samples were taken for phytoplanktons analysis by adding 4% formalin for preservatioin and identification of phytoplanktons carried out under microscope.

Table 1- Monthly observation of phytoplankton during 2019-20 in Bhivapur lake.

Phytoplankton	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
A)Chlorophyceae												
<i>Chlorella sp.</i>	+	+	+	+	+	-	-	-	-	-	-	-
<i>Cosmarium sp.</i>	+	+	+	+	+	+	+	+	+	+	-	-
<i>Oedogonium sp.</i>	+	+	+	+	+	+	+	+	+	+	-	-
<i>Spirogyra sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ulothrix sp.</i>	+	+	+	+	+	+	-	-	-	+	+	+
<i>Zygnema sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Chara sp.</i>	-	-	-	+	+	+	+	+	+	+	+	+
<i>Nitrella sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
B)Cyanophyceae												
<i>Anabaena sp.</i>	+	+	+	-	+	+	+	+	+	+	+	-
<i>Nostoc sp.</i>	-	+	+	+	+	+	+	+	+	-	-	+
<i>Oscillator sp.</i>	+	+	+	+	+	+	-	-	+	+	+	+
<i>Microcystis sp.</i>	+	+	+	+	+	+	+	+	-	-	-	+
C)Bacillariophyceae												
<i>Diatom sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+

3. RESULT AND DISCUSSION:

In present investigation, phytoplanktons were study from Bhivapur lake water because of presence of Phytoplankton changes ecological status of the lake Bhivapur. Different group of classes Chlorophyceae, Cyanophyceae, Bacillariophyceae, were studied from which *Cosmarrium*, *Oedogonium*, *Spirogyra*, *Ulothrix*, *Zygnema*, *Chara*, and *Nitrella* were observed throught the year. The *Chlorella*, *Oedogonium*, *Ulothrix* and *Nitrella*, were observed during Monsoon season. Hydrodictyon species were observed in month of June. The most important factor in controlling the population of Former (Lin,1972).

In present study, Bacillariophyceae species such as *Diatom* occurs throught the year. The occurrence of *Diatom* is responsible of various enviromental changes (Patil, 1982).

Some species of Cyanophyceae were observed that was *Anabena*, *Nostoc*, *Oscillatoria* were studied throught the year. *Microcystis* observed in monsoon season. The presence of *microcystis* was the indicators of toxic substances producing algal species.



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Synthesis of pyrazines and imidazoles using lemon juice (*Citrus limon*) as a recyclable catalyst

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One-pot four component synthesis of 2,5,6-triaryl pyrazines, 1,2,4,5-tetraaryl imidazoles and 2,2,4,5-tetraaryl imidazoles have been achieved from benzoin, aryl amine, ammonium acetate and aryl ketone /aryl aldehydes using lemon juice (*Citrus limon*) as an ecofriendly catalyst in good yield under mild conditions. The antibacterial action exhibited by the synthesized compounds against clinical isolates obtained from urinary tract catheters of infected patients is close to the standard drug tetracycline. Recovery of lemon juice after completion of reaction eliminates the need to handle side products, making this process more safe and user friendly.

Keywords: Green synthesis, pyrazines, imidazoles, natural acid catalyst, recyclable catalyst

Classical heating methods are being replaced by some sustainable and clean method in drug discovery due to efforts of adopting green chemistry protocol. Modern chemistry offers several approaches for diversity oriented synthesis for generation of diverse library of compound^{1,2}. Some chemical transformation do not occur under conventional heating could be possible by microwave irradiation as well as grinding in mortar and pestle. Now a day's grinding method is highly recommended by chemists and biologists because of environment friendly and inexpensive protocol. Simple mechanochemical stirring is required to obtain the product without using any kind of energy³. Mineral acids such as HF, HCl and H₂SO₄ are of great demand in chemical reactions but have some limitations due to corrosive and harmful effect as catalysts. Natural acid is considered as alternate catalyst as concern for development of newer catalyst and environment benign reactions. Fruit lemon juice (*Citrus limon*) is easily available natural acid catalysts as contains important component citric acid (6-7%) along with carbohydrate, vitamin-C, protein, mineral, water and other organic acids also be used as acid catalyst in organic reactions.

Lemon juice containing citric acid initiates the reaction by activating the functional group *i.e.* carbonyl group of aldehydes and ketone in MCR to get the desire products⁴. The natural acids can catalyses cycloaddition as well as condensation

reactions with greater improvement in yields beside this easy availability, handling, non-toxicity and recovery after reaction complete are the important characteristics of natural acid that make its green catalysts⁵. Some ionic liquid and surfactants in water are widely useful in synthetic chemistry but have some drawbacks such as high cost, require in large amount and low yields of product.

Pyrazines are significant class in heterocyclics with diverse biological application; particularly purines derivatives containing pyrazine nucleus possesses various pharmacological activities such as anti-inflammatory⁶, antidepressant⁷, antiproliferative activities⁸, relaxing cardiovascular, antithrombotic, anti-aggregation, COX-2 inhibiting effects⁹. Some alkoxy pyrazines are relevant aromas components of vegetables and fruits, alkyl/aryl pyrazines recognized as flavour components in foods as well as pheromones in various insect species^{10,11}. On the other hand novel drug molecules such as saripidem zolpidem and necopidem containing the imidazole moiety shows wide spectrum of biological properties¹²⁻¹⁴. The imidazoles also shows properties against the viral diseases¹⁵, migraine¹⁶, heart^{17,18}, and array of neurological syndromes¹⁹, diabetic effects²⁰ and cancer cell growth effect²¹. Because of the variety applications associated with pyrazine and imidazole nucleus, herein, we report an efficient and green method for one-pot four component synthesis of



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Synthesis and Characterization of Some Novel Sugar Containing -2, 4-Isodithiobiurets

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Abstract

A series of Novel 1-aryl-5-hepta-*O*-benzoyl- β -D-lactosyl-2-*S*-benzyl-2, 4-isodithiobiurets were synthesized by the interaction of 1-aryl-2-*S*-benzyl isothiocarbamides and hepta-*O*-benzoyl- β -D-lactosyl isothiocyanate in benzene medium. The identities of these newly synthesized *N*-lactosides have been established on the basis of usual chemical transformations and IR, ¹H NMR and Mass spectral analysis. The polarimetric study of all compounds was carried out. The study of *S*- and *N*-glycosides is important in carbohydrate chemistry. Sugar isothiocyanate is good precursors and versatile intermediate for synthesis of *S*- and *N*-glycosides. Carbohydrates play an important role in the number of biological events and play an important role in their synthetic strategy as well. Similarly the amino sugars are an important class of glycosidase inhibitors and are arousing great interest as potential therapeutic agents.

Keywords: Lactosyl isothiocyanate; 1-aryl-2-*S*-benzyl isothiocarbamides; isodithiobiurets

Introduction

Aryl/alkyl isothiocarbamides, due to their basic nature are found to interact with isothiocyanate to form corresponding isodithiobiurets. Several non-glycosidic isodithiobiurets are known for their anticonvulsant and hypnotic activities, Glycobiology [1] has gained much attention because the oligosaccharide part and other glycoconjugates are responsible for their function in various biological processes viz. cell growth. Regulation, immunological responses, inflammation and bacterial and viral infections [2-4]. Literature survey reveals that synthesis of amino, diamino derivatives which exhibit biological and pharmaceutical activities such as antimalarial effect [5,6]. Glycosyl thiourea has been widely used as important intermediate in the synthesis of nucleoside analogs [7-9]. Thiobiurets, imidazoles and thiazolines also shows anti-inflammatory, antitumor, hypnotic activities [10,11]. In recent years, steadily increasing research effort has centered on the production of glycosyl biurets because these compounds have been shown to possess many different biological activities. Some carbohydrate base urea exhibit relevant biological properties such as the antibiotic SF-1993, CV-1. Nitroso urea have shown to be alpha-glycosidase inhibitors, possesses antitumor activity. In the last years the intensive use of antibiotic has lead to an increase of the emergence of resistant bacteria [12]. There is a growing need for new class of antibacterial compounds having different mechanism of action compared to existing drugs.



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Antimicrobial activities of some newly synthesized N-lactosylated dithiazolidines and thiadiazines

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Abstract

A newly synthesized 4-Aryl-5-hepta-O-benzoyl- β -D-lactosylimino-3-thio-1,2,4-dithiazolidines (hydrochloride)(1a-f) have been prepared by the interaction of 1-hepta-O-benzoyl- β -D-lactosyl-S-chloro-isothiocarbamoyl chloride and ammonium aryl dithiocarbamates. Similarly, the compounds 2-hepta-O-benzoyl- β -D-lactosylimino-3-aryl-4-S-benzyl-6-phenylimino-2,3-dihydro-1,3,5-thiadiazines (hydrochlorides) (2a-f) have been prepared by the interaction of 1-aryl-5-phenyl-2-S-benzyl-2,4-isodithiobiurets and hepta-O-benzoyl- β -D-lactosyl-isocyanodichloride. A series of novel 4H,4-thio-2-hepta-O-benzoyl- β -D-lactosylimino-3-phenyl-2,3-dihydro-(1,3,5)-triazino-(2,1b)6,7 or 8 aryl benzothiozoles (hydrochlorides) (3a-f) have been synthesized by the interaction of several 1-hepta-O-benzoyl- β -D-lactosyl-3-aryl benzothiozoyl-thiocarbamides with N-phenyl isocyanodichloride. In the present investigation activities of these N-lactosides against bacteria and fungi such as *Escherichia coli*, *Proteus vulgaris*, *Staphylococcus aureus*, *Salmonella typhi*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Aspergillus niger* and *Candida albicans* are discussed.

Keywords: Synthesis, 1, 2, 4-dithiazolidines, 1, 3, 5-thiadiazines, triazino, benzothiozoyl-thiocarbamides, isocyanodichloride, 2, 4 isodithiobiurets, ammonium aryl dithiocarbamates.

1. Introduction

A series of new N-lactosides have been found to be use as diuretic, analgesics, antidiabetic, bacteriostatic, antifungal, antimicrobial and antithyroid drugs. N-lactosides are those compounds in which lactosyl group or its derivatives are attached to the nitrogen of the nitrogen containing



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LIGHT POLLUTION: IT'S IMPACT ON ECOSYSTEM

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Abstract: Most of us are well familiar with the term pollution. The air pollution, water pollution, e-waste pollution and land pollution are known examples of pollution but ever we think about the light-which is a source of energy for the web of life, which dependent on and determined by, day and night, light and dark. But on the other hand artificial lighting, which has become a necessity to facilitate human activity at night-time, contributes to the so-called Light Pollution. When such pollution occurs, the visibility of the night sky is degraded and an unnecessary amount of energy is wasted. The inappropriate or excessive use of artificial light leads into serious environmental consequences for humans, wildlife, and our climate. Thus the present study focus on the impact of manmade light pollution on the ecosystem

Key words: Light Pollution, Photosynthesis, Wildlife, Ecosystem.

INTRODUCTION

Artificial lighting, which has become a need to facilitate human activity during night-time, contributes to the so-called Light Pollution. Which the result in to degradation of visibility of the night sky and wasting of unnecessary amount energy. Due to the unlimited expansion of human habitation near and within natural habitats, resulting into direct exposure to nearby rich ecosystems due to the artificial night lighting. This increased and widespread use of artificial light during the night time not only impairing the beautiful view of our universe but it also affecting our environment, our energy consumption and our health.(Longcore and Rich 2004) . Generally the light pollution divide in to two categories i.e annoying light and excessive light or indoor and outdoor light pollution. The light pollution is defined as " the adding of the artificial light directly or indirectly in to the environment by the humans". According to the International Dark-Sky Association the light pollution is defined as "any adverse effect of artificial light including sky glow, glare, light trespass, light clutter, decreased visibility at night, and energy waste." Before 100 years ago, everyone could look up and could see the beautiful and spectacular view of night sky but now a days due to the urbanisation and industrial civilisation millions of children across the world never experience the Milky Way where they live. Astronomy is very sensitive to light Sky glow over the large cities is a major issue for many astronomers across the globe because it obscures stars, even in perfectly clear nights. The scientists all over the world stated that the sky brightness is at least 2 to 4 times above normal in large parts of urban areas in Europe and North America. Light pollution can have adverse health effects such as frequent headaches, fatigue, increased stress, decrease and increased anxiety. It is also noted that the light pollution destroys nitrate radicals thus preventing the normal night time reduction of atmospheric smog produced by fumes of cars and industries. Nemiroff and Bonnell(2010)Thus by protecting the night sky is valuable step to conserving the bio-diversity.

Types of Light Pollution:

Light pollution is a side effect of industrial civilization. Its sources includes building exterior and interior lightning, advertisement boards , out door lightening, factories etc. Light pollution can reach the environmental elements via three main paths: (i) direct illumination, (ii) scattered light by cloud cover and (iii) scattered light from a clear sky and thus it is categories into following types which includes over-illumination, glare, light clutter, sky glow .

1. Over- illumination: The over illumination is caused by misuse of lights. Lights that are left on or even street lamps that are not adjusted for daytime saving time. If we estimated the cost of it , it can cause millions of barrels of oil to be wasted. It can have the immediate effect of raising utility costs in an area as well as disrupting natural sleep patterns.

2. Glare: Glare is two fold problem in which lights are reflected off surrounding surface so that light scatters due to the excessive brightness and causes vision problems. It does not interfere with night vision, but makes it difficult to identify the place and objects.

3. Light Trespass: In this type of light pollution where the unwanted light get trespass and entered in to someone's private property. This is not just a pollution but it also a crime in many developed countries. A common light trespass problem occurs when a strong light enters the window of one's home from outside, causing problems such as sleep deprivation or the blocking of an evening view.

4. Light clutter: Light clutter is a mostly manmade issue and it seems from poor placement and designing of light. It also referred as the excessive grouping of lights which may generate confusion, distract from obstacles. A cluster of business lights or streetlights can create a contrast illumination that interferes with night vision and illumination. It can be strong enough to throw off the natural nocturnal system of animals.

5. Sky Glow: This is a term used to refer to the almost dome-like cover of lights to city area or populated area. The lights that get reflected from street lights, signs, homes and business area goes up to change the quality of light in the atmosphere and bounce back down to the city from the atmosphere. It can affect natural growth pattern and the ability of planes to navigate at night.

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Flowering phenology and Pollen Histochemical analysis of *Gossypium Sp.*

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Abstract

Phenology is the study of timing of vegetative activities, flowering and fruiting and their relationships to environmental factors. "Flowering Phenology" refers to the seasonal timing of flowering. Pollen histochemical analysis are carried out for , possible relation between the pollen content and the mode of pollination , study of pollinator foraging behavior, nutritional demands, pollination mode, pollen content and composition in relation to phylogeny. Lipids and starch are important constituents of the pollen grains to establish the relations with flower foragers. From the histochemical tests it was noted that the pollen grains of all cotton varieties contains starch and lipids. Thus the Pollen grains of all cotton varieties belong to the class of starchy pollen as in all varieties it showed positive test. From the histochemical tests it was noted that the pollen grains of all cotton varieties contains starch and lipids. Pollen histochemistry is possibly related to pollination mode, pollinator foraging behavior and phylogeny. The nutritive value of pollen also influences the behaviour of flower visitors.

Keywords: *Gossypium, Pollen , Starch , lipid, IKI, Sudan IV*

I INTRODUCTION

A phenological record depends on parameter chosen by the various investigators and depends on the research levels, the aim of the research, and the type of analysis. The main events are the timing, duration, sequence, intensity and timing of flowering, which can determined by the physical environment factors like temperature, rainfall and day- length (Dafni, 1992). Plants reproductive characteristic can affect the flowering phenology, mode of seed dispersal and fruiting seed set efficiency. A wide variety of environmental factors may select for one or more reproductive characteristic in plant population (Smith *etal*, 1986) and such factors include seasonal climatic events (Schemske, 1977). The basic Palynology can also be referred investigations of pollen and spore dispersal, preferably by wind and water and of the pollen and spore content of peat and sediments under formations. Understanding the Palynology of commercially important crop plants like cotton is



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**PHYTOCHEMICAL SCREENING AND ANALYSIS OF SELECTED
MEDICINAL PLANT IN LOCAL AREA**

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Abstract:

Phytochemical is a valuable step. Medicinal plants have a bioactive compound which is used for curing of various diseases. Medicinal plants are an important source of phytochemicals that offer traditional medicinal treatment of various ailments.. The present study involves in medicinal plants *Catheranthus roseus*, *Ocimum sanctum* locally available in Akola. The samples were extracted using solvents like acetone, chloroform, ethanol, petroleum ether and water. These mixtures were shaken at room temperature for 24 h. After incubation, the extracts were filtered using Whatman No.1 filter paper, collected and stored at 4°C. Preliminary phytochemical screening was performed by standard methods. The phytochemical screening revealed the presence of alkaloids, carbohydrates, flavonoids, phytosterols, proteins, steroids, terpenoids, phenols, saponins, quinones, coumarins and glycosides. The result reveals the presence of bioactive constituents comprising alkaloids, flavonoids, phenolics, tannins, glycosides, steroids and saponins in different solvents. The presence of these phytochemicals can be correlated with the medicinal potential of this plant.

Key words: Photochemistry, *Catheranthus roseus*, *Ocimum sanctum* , Phyto-constituents

Introduction:

Medicinal plants play a major role in meeting the medical and health needs of about 70% of populations in developed and developing countries, which serve as an important resource for the treatment of various maladies and illnesses (Ngari et al., 2010). Globally, about 85% of the traditional medicines used by different ethnic groups inhabiting various terrains for primary healthcare are derived from plants, especially in India; medicinal plants are widely used by all sections of the population with an estimated 7500 species of plants used by several ethnic communities (Farnsworth, 1988). The plant is being used by the local peoples and tribal of Maharashtra as ethno medicine on various ailments. This plant is also being used for its anti-inflammatory, anti-diarrheal properties by various communities in Indian subcontinent and also across the world. The present study was designed to evaluate the fundamental phytochemical constituents of are known to have various biological activities such as antimicrobial, antifungal, antioxidant, etc. The important bioactive components in plants are usually the secondary metabolites such as alkaloids, flavonoids, tannins and other phenolic compounds (Edeoga et al., 2005). The Medicinal plants have potent phytochemical components which are important source of antibiotic compounds and are responsible for the therapeutic properties (Jeeva et al., 2011; Jeeva and Johnson, 2012; Florence et al., 2012 & 2014; Joselin et al., 2012 & 2013; Sainkhediya and Ray, 2012; Sumathi and Uthayakumari, 2014). Therefore, the present work aims at evaluating the phytochemical composition, by qualitative and quantitative methods, of methanol, ethanol and chloroform extracts namely, *Ocimum sanctum*, *Catheranthus roseus* are known to be of medicinal use. The use

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Pathological Communication

Enzyme Alterations in Haemolymph of the Silkworm, *Bombyx mori* During Grasserie Infection

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²B.S. Patel College, Pimplegaonkale, India.

ABSTRACT

The silkworm *Bombyx mori* is a domesticated tiny insect having a remarkable economic significance. Occurrence of diseases in silkworm *Bombyx mori* is fairly common and inflict serious losses. The major disease affecting mulberry silkworms is Grasserie, which is a viral infection causing reduced production of silk in India and other countries primarily by the *Bombyx mori*, Nuclear Polyhedrosis Virus (BmNPV). In India, >50 % of silk cocoon crop losses are attributed to BmNPV infections. Presently, there are no specific preventive measures to treat the spread of BmNPV infection other than sanitized rearing methods, where the only commercial practice today is to discard large stocks of worms during the infection. Once infected, the disease pathogen in silkworm becomes highly efficient at manipulating the physiological and endocrinological responses of the body. In order to provide references for further study on the infection and pathogenesis of BmNPV, this research was explored for the changes in the haemolymph enzyme activities. For the study, healthy and Grasserie infected mulberry silkworms were collected from the local sericulture units and reared in the laboratory to analyse the intensity of enzyme activity. The enzyme profile of both healthy and infected worms was recorded by using Clinical Analyser. The study revealed, significant decrease in enzyme activity of alkaline phosphatase, acid phosphatase, alanine amino transferase, aspartate amino transferase, in the infected larvae as compared with control healthy silkworms. Enzyme alterations reported in the present study, can be used as a marker, for indication of Grasserie disease in local mulberry silkworm colonies.

KEY WORDS: ACID PHOSPHATASE, ALANINE AMINO TRANSFERASE, ALKALINE PHOSPHATASE, ASPARTATE AMINO TRANSFERASE, BOMBYX MORI.

INTRODUCTION

The silkworm *Bombyx mori* is a domesticated tiny insect having considerable economic significance. It is a well-known and economically important insect as it is a producer of valuable silk. Over 85% of the global silk production comes from the mulberry silkworm, *B. mori*. In India, the silk industry has made significant progress during the past two decades where it occupies the second position in global silk production next to China. As per the statistics, India has 82 lakh farmers in 62,000 villages engaged in sericulture and Indian raw silk production

is 35,000 metric tonnes, (Statista Research Department, 2021).

Diseases in silkworm *Bombyx mori* are fairly common in occurrence and are serious in inflicting losses. The country has produced 35,820 MT of silk against the target of 38,530 MT during 2019-20 achieving 93.0% of the target. This is the progress during the past decades of silkworm industry but, this progress stops or reduces production when disease occurs. Grasserie is a viral infection, in silkworms which is the major cause for damage and reduced production of silk in India and other countries. The disease is caused primarily by *Bombyx mori* Nuclear Polyhedrosis Virus (BmNPV). The disease occurrence is a common phenomenon during all stages in silkworm rearing (Joshi and Raja 2013, Annual Report 2020).

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Editors Communique

Have we tamed the coronavirus? May be yes,
as pandemics do not die, they can only be faded !

Science and technology has made it possible, in the shortest span of time, it has shown that with firm determination and international cooperation, we can win over the onslaughts of even the worst of the pandemics. COVID-19 is perhaps fading over now, due to our coordinated efforts worldwide. Though we have lost millions, in the two year period, partly due to the mishandling of the viral attacks and somewhat by our own follies and carelessness. Anyway lessons learnt from the past, always make us more stronger and determined. Let us now not relax and work on a better mode, as all is still not well yet. The almost taming of the virus and its cousins have indicated some of the concealed failures, on which we have to focus now. We have to be more vigilant, and even a bit of laxity can spoil the good work done. On societal and governmental parts, utmost care and caution is required on a long term basis.

On behalf of *Bioscience Biotechnology Research Communications*, we falter at words to express our deep sense of solitude and grief on the catastrophic events of the world wide pandemic, spanning over two years now. We pray for the strength to bear this universal calamity and come up with long lasting fortitude to eradicate it soon.

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Quality publication is one of the ways to keep science alive, and good journals have a leading role to play in shaping science for humanity! As teachers, we have great responsibilities, we have to advocate our students to accomplish and show them the path to test their mettle in hard times to excel, especially in the post COVID 19 era. Science and its advocates will rise more to the occasion and will soon provide succor to the already grief stricken humanity.

Sharique A. Ali, PhD

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**PURE ZINC OXIDE BASED NONO THICK FILM FOR WATER
VAPOUR SENSING APPLICATION****R M Agrawal*¹, S D Charpe², G T Lamdhade³, K B Raulkar⁴**

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Abstract

In this paper pristine Zinc Oxide (ZnO) nanoparticles was synthesized by a co precipitation method. The structural and compositional characterization has been studied by using X-ray powder diffraction (XRD). The sensors are made in the form of thick film. The Surface morphologies of the prepared samples were analyzed using Field Emission Scanning electron microscopy (FE-SEM) for thick film. Further, Water vapour or humidity sensing investigations of these sensing materials were done. Our result indicate that ZnO in form of thick film sensor is most sensitive for humidity under same conditions. The hysteresis plot between increasing and decreasing the RH range from 30–90% RH and vice versa has been studied. The samples resistance decreases from $10^{11} \Omega$ to $10^8 \Omega$ respectively. The similar change was also observed in sensitivity. The results were re- producible up to $\pm 77\%$ after 2 months of observations.

Keywords:ZnO, Humidity chamber, XRD.**Introduction**

Humidity plays a very important role in every part of the earth surface especially in various biology and automated industrial area. For the required surrounding atmosphere, it is most important to monitor, detect and control the ambient humidity under different conditions. Recently, in the field of material science, nanocrystalline materials divert much interest due to their novel structural, electrical and optical properties which are significantly differ from the bulk solid state [1].The fundamental properties of ZnO, like growth, electrical and optical properties, since the potential for optoelectronic devices based on ZnO is also one of the main motivations for the present work. ZnO is a direct wide band-gap 3.37 eV and II-VI binary compound semiconductor and crystallizes in three forms such as hexagonal wurtzite, cubic zinc blende and the rarely observed cubic rock salt [2]. A tendency of different fast growth directions of ZnO could result in growth of a diverse group of hierarchical and complex nanostructures. This is partly reflected by the various structural morphologies of ZnO nanomaterials such as nanorods, nanotubes, nanocorals, nanoflowers, and nanowalls[3].

Experimental

In preparation Zinc Oxide (ZnO) 0.2M Zinc Acetate dehydrates was dissolved in 100 ml deionised water was ground for 15 min and then mixed with 0.02 M solution of NaOH with the help of glass rod. After the mixing the solution was kept under constant magnetic stirring for 15 min. and then again it was ground for 30 min. The white precipitate product was formed at the bottom. Then abundant liquid was discarded and the product was washed many times with the deionized water and methanol to remove by products. The final products were then filtered and obtain precipitate in the form of white paste, now this paste was kept in a vacuum oven at 80 °C for 4 hrs. so the moisture will remove from the final product and we will get dry product. Then this dry product was crushed into a fine powder

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CuO- ACTIVATED ZnO THICK FILMS FOR H₂S GAS SENSOR AT LOWER TEMPERATURE

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Abstract

the zno nanostructures have been synthesized and studied as the sensing element for the detection of h₂s gas. the zno nanostructures were synthesized by sol-gel method followed by sonication. by using screen printing method, thick films of synthesized zno nanostructure were deposited on glass substrate. surface of this films were activated by cuo for gas sensing properties, low concentration h₂s gas at different temperature. zno nanostructure synthesized by this method can be used as a promising material for semiconductor gas sensor to detect gas like h₂s at room temperature with high sensitivity and selectivity.

Keywords: zno nanostructure; thick films; surface activation; h₂s sensor.

Introduction

the last century has seen increased industrial growth worldwide. a side effect of this development is an exponential increase in pollution of earth, air and water, especially in densely populated areas. while land pollution is locally restricted and great efforts have been made during the last decades to improve the quality of rivers and larger bodies of water, air pollution is not so easily reduced. the hazardous gas detection spans from environmental monitoring, automotive applications, air conditioning in airplanes, space crafts and houses, explosive detection of sensors networks, and so forth.

nowadays, there is a great interest in implementing sensing devices in order to improve environmental and safety control of gases. the most used gas sensor devices can be divided in three big groups depending on the technology applied in their development: solid state, spectroscopic and optic. while spectroscopic and optic systems are very expensive for domestic use and sometimes difficult to implement in reduced spaces as car engines, the so called solid state sensors present great advantages due to their fast sensing response, simple implementation and low prices [1-3]. these solid state gas sensors are based on the change of the physical and chemical properties of their sensing materials when exposed to different gas atmospheres.

numerous materials have been reported to be usable as metal-oxide chemical sensors including both single-component (e.g., zno, sno₂, wo₃, tio₂, and fe₂o₃) and multi component oxides (bifeo₃, mgal₂o₄ and sr_{1-y}ca_yfe_{3-x}). the metal-oxide semiconductors like zno or sno₂ react with atmospheres like oxygen, carbon monoxide and carbon dioxide which has been known for years and investigated intensively. conductometric metal-oxide-semiconductor thin or thick films are the most promising devices among solid state chemical sensors, due to their small dimensions, low cost, low power consumption, on-line operation, and high compatibility with microelectronic processing.

zno is also a promising material for the realization of electronic and optoelectronic devices due to its specific chemical, electrical, surface, and microstructural properties. zno is a

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Kaluza-Klein Universe in $f(R, T)$ Gravity with Constant Deceleration Parameter in Presence of Quark Matter

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Abstract: In the present paper considered Kaluza-Klein cosmological model with quark matter and strange quark matter in $f(R, T)$ theory of gravity which proposed by Harko *et al.* (2011). The general solutions of the field equations of Kaluza-Klein space-time have been obtained under the assumption of constant deceleration parameter in the context of power-law volumetric expansion model. The physical and geometrical aspects of the model are also discussed.

Keywords: Kaluza-Klein Space-time, $f(R, T)$ theory of Gravity, Constant Deceleration Parameter

1. Introduction

A fundamental theoretical challenge to gravitational theories has been imposed by the observational data [1 – 6] on the late time acceleration of the universe and the existence of the dark matter. Carroll *et al.* [7] explained the presence of a late time cosmic acceleration of the universe in $f(R)$ gravity. Bertolami *et al.* [8] have proposed a generalization of $f(R)$ modified theories of gravity, by including in the theory an explicit coupling of an arbitrary function of the Ricci scalar R with the matter Lagrangian density L_m . Several $f(R)$ gravity models are reviewed by Capozziello & Faraoni [9]. Harko & Lobo [10] proposed a maximal extension of the Hilbert-Einstein action, by assuming that the gravitational Lagrangian is given by an arbitrary function of the Ricci scalar R and of the matter Lagrangian L_m .

Harko *et al.* [11] developed $f(R, T)$ modified theory of gravity, in this theory the gravitational Lagrangian is given as an arbitrary function of the Ricci scalar R and also function of the stress-energy tensor T . They have obtained the gravitational field equations in the metric formalism, as well as, the equations of motion for test particles, which follow from the covariant divergence of the stress-energy tensor. Generally, the gravitational field equations depend on the nature of the matter source. They have presented the field equations of several particular models, corresponding to some explicit forms of the function $f(R, T)$. Reddy *et al.* [12, 13] have extended this work for Kaluza-Klein and Bianchi type-III Universe and Adhav [14] for LRS Bianchi type-I Universe in the presence of perfect fluid source in the framework of $f(R, T)$ gravity.

The theory of five dimensions is due to the idea of Kaluza [15] and Klein [16]. A five-dimensional general relativity is the best outcome of an attempt made by these two by using one extra dimension to unify gravity and electro-magnetism. Kaluza-Klein theory is essentially an extension of Einstein's general relativity in five dimensions which is of much interest in particle physics & cosmology.

The number of studies has been done by considering quark matter and strange quark matter in general relativity and other modified theories of gravity [17 – 20]. Recently, Prasad *et al.* [21] considered the bulk viscous fluid for the model in $f(R, T)$ gravity. Maurya *et al.* [22] have studied Domain walls and quark matter in Bianchi type-V universe with observational constraints in $f(R, T)$ gravity.

In the present paper, studied Kaluza-Klein cosmological model with Quark Matter (QM) and Strange Quark Matter (SQM) in $f(R, T)$ theory of gravity which proposed by Harko *et al.* [11]. The general solutions of the field equations of Kaluza-Klein space-time have been obtained under the assumption of constant deceleration parameter in the context of power-law volumetric expansion model. The physical and geometrical aspects of the model are also discussed in details.

2. Gravitational field equations in $f(R, T)$ theory of gravity

In $f(R, T)$ theory of gravity, the field equations are obtained from the Hilbert-Einstein type variation principle [11]. The action for this modified theory of gravity is given by

$$S = \frac{1}{16\pi} \int f(R, T) \sqrt{-g} d^4x + \int L_m \sqrt{-g} d^4x, \quad (1)$$

where $f(R, T)$ is an arbitrary function of the Ricci scalar R and of the trace T of the stress-energy tensor of the matter $T_{\mu\nu}$ and L_m is the matter Lagrangian.

The corresponding field equations of the $f(R, T)$ gravity is found by varying the action (1) with respect to the metric $g_{\mu\nu}$:

$$f_R(R, T) R_{\mu\nu} - \frac{1}{2} f(R, T) g_{\mu\nu} + (g_{\mu\nu} \square - \nabla_\mu \nabla_\nu) f(R, T) = 8\pi T_{\mu\nu} - f_T(R, T) T_{\mu\nu} - f_T(R, T) \theta_{\mu\nu}, \quad (2)$$


$$\text{where } f_R(R, T) = \frac{\partial f(R, T)}{\partial R}, \quad f_T(R, T) = \frac{\partial f(R, T)}{\partial T},$$

$$\square = \nabla^\mu \nabla_\mu, \quad \theta_{\mu\nu} = g^{\alpha\beta} \frac{\delta T_{\alpha\beta}}{\delta g^{\mu\nu}}; \quad (3)$$

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Bianchi Type-III Cosmological Model With Special Form of Deceleration Parameter in $f(R, T)$ Gravity

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Abstract : The present study deals with the Bianchi type-III cosmological model with special form of deceleration parameter in presence of perfect fluid in $f(R, T)$ theory of gravity proposed by Harko *et al.* (2011). The solutions of the field equations have been obtained by applying the law of special form deceleration parameter proposed by Singha and Debnath (2009). The physical and geometrical parameters of the model are obtained and discussed in details.

Keywords : Bianchi type-III Space-time, $f(R, T)$ Gravity, Perfect fluid, Special form of Deceleration Parameter.

I. INTRODUCTION

Recent cosmological observations such as Type-Ia Supernova (Reiss *et al.* 1998, Perlmutter *et al.* 1999, Bernardis *et al.* 2000, Hanany *et al.* 2000, Peeble & Ratra 2003, Padmanabhan 2003) challenge to gravitational theories on the late time acceleration of the universe and the existence of the dark matter. In the last two decades, high red-shift supernovae type Ia (SNIa) (Riess *et al.* 1998, Perlmutter *et al.* 1999, Bennett *et al.* 2003) have carried out cosmological experiments to understand the evolution of present Universe. The observational data obtained from these experiments confirmed the cosmic accelerated expansion of the present universe. Further, recent cosmic observations like Cosmic Microwave Background (CMB) (Spergel *et al.* 2003, Oli 2012), the large-scale structure Tegmark *et al.* (2004) and the CMB radiation (CMBR) (Caldwell & Doran 2004, Carroll *et al.* 2004) discovered the late time cosmic acceleration of the Universe. Hence modified theories of gravitation become popular in astrophysics and modern cosmology. These modified theories of gravitation assumed that General Relativity (GR) imparts at large scales and hence for describing the gravitational field, extension of an Einstein–Hilbert action is required without using dark energy components in the field equations. All these Quantitative observations suggests that there is a hitherto unknown component, dubbed dark energy which is responsible for the cosmic acceleration. In view of this it is now believed that energy composition of universe has 4% ordinary matter, and 20% dark matter and 76% dark energy.

During last decade, there are several modified theories of gravitation have been proposed to understand the mechanism behind late-time acceleration and the presence of dark energy, dark matter in the Universe. Among the various modifications of modified theories, the $f(R)$ theory of gravity has been extensively investigated by several authors (Capozziello *et al.* 2005, Nojiri *et al.* 2006, Nojiri & Odintsov 2007). This $f(R)$ theory gravity can be established through the Einstein–Hilbert action principle in which the matter Lagrangian is replaced by an arbitrary function. Initially, Buchdahl (1970) has proposed the class of the modified theories of gravity. The $f(R)$ theory became more popular after the developments done by Starobinsky (1980). Various aspects of $f(R)$ gravity have been studied by Akbar & Cai (2006), Chiba *et al.* (2007) and Multamäki & Vilja (2006, 2007). Copeland *et al.* (2006) widely discussed reviews of several models of modified $f(R)$ theory of gravity.

After some modification in $f(R)$ theory of gravity, Harko *et al.* (2011) introduced $f(R, T)$ theory of gravitation representing the realistic alternative to Einstein’s theory. This modified theory has been attracting more and more attention of researchers in recent years to explain late time acceleration and dark energy. In this modified theory of gravitation, the gravitational Lagrangian is given by an arbitrary function of the Ricci scalar R and of the trace T of the stress-energy tensor. They have obtained the gravitational field equations in the metric formalism, as well as, the equations of motion for test particles, which follow from the covariant divergence of the stress-energy tensor. Generally, the gravitational field equations depend on the nature of the matter source. They have presented several particular models, corresponding to some explicit forms of the function $f(R, T)$. Harko *et al.* (2011) have investigated FRW cosmological model in this theory by choosing appropriate function $f(T)$. They have also

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RESEARCH ARTICLE

**KALUZA – KLEIN COSMOLOGICAL MODEL WITH QUARK AND STRANGE QUARK MATTER
IN $f(R, T)$ GRAVITY**

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Abstract

In this paper, Kaluza-Klein space-time with quark and strange quark matter in $f(R, T)$ gravity has been studied. The general solutions of the field equations of Kaluza-Klein space-time have been obtained under the assumption of constant deceleration parameter. The physical and geometrical aspects of the model are also discussed in details.

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Introduction:-

A fundamental theoretical challenge to gravitational theories has been imposed by the observational data (Reiss *et al.*[1], Perlmutter *et al.*[2], Bernardis *et al.*[3], Hanany *et al.* [4], Padmanabhan [5], Peeble and Ratra[6]) on the late time acceleration of the universe and the existence of the dark matter. Carroll *et al.*[7] explained the presence of a late time cosmic acceleration of the universe in $f(R)$ gravity. Bertolami *et al.*[8] have proposed a generalization of $f(R)$ modified theories of gravity, by including in the theory an explicit coupling of an arbitrary function of the Ricci scalar R with the matter Lagrangian density L_m . Several $f(R)$ gravity models are reviewed by Capozziello *et al.*[9]. The Palatini formulation of the non-minimal geometry-coupling models was considered by Harko *et al.*[10]. Harko and Lobo [11] proposed a maximal extension of the Hilbert-Einstein action assuming the gravitational Lagrangian as an arbitrary function of the Ricci scalar R and of the matter Lagrangian L_m .

Harko *et al.*[12] developed $f(R, T)$ modified theory of gravity, where the gravitational Lagrangian is given by an arbitrary function of the Ricci scalar R and of the trace of the stress-energy tensor T . They have obtained the gravitational field equations in the metric formalism as well as the equations of motion for test particles, which follow from the covariant divergence of the stress-energy tensor. Generally, the gravitational field equations depend on the nature of the matter source. They have presented the field equations of several particular models, corresponding to some explicit forms of the function $f(R, T)$. Reddy *et al.*[13,14] have extended this work for Kaluza-Klein and Bianchi type-III Universe and Adhav [15] for LRS Bianchi type-I Universe in presence of the perfect fluid in $f(R, T)$ gravity.

The theory of five dimensions is due to the idea of Kaluza [16] and Klein [17]. A five dimensional (5D) general relativity is the best outcome of an attempt made by these two by using one extra dimension to unify gravity and electro-magnetism. Realistic unification through the Kaluza-Klein approach requires $d = 5$ manifold topology and the spatial extra dimension radius is of Planck length order. According to Wesson [18,19] and Bellini [20], the matter is induced in 4D by 5D vacuum theory for studying the cosmology of 5D with pure geometry in non-compact

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Improvement of quantum efficiency through Gd³⁺ to Eu³⁺ energy transfer in YF₃ phosphor

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Abstract

This paper reports the energy transfer from Gd³⁺ to Eu³⁺ in YF₃ and the consequent downconversion luminescence for the YF₃:Gd³⁺, Eu³⁺ fluoride phosphor. The phosphor was synthesized using a soft chemical route, followed by a reactive atmosphere process. Because of the wide band gap in YF₃ and the correct energy site for ⁸S_{7/2}-⁶G_J transitions of Gd³⁺ ions, fluoride YF₃ doped with Gd³⁺-Eu³⁺ were studied in their vacuum-ultraviolet (VUV) spectral regions. Powder X-ray diffraction (XRD) analysis showed the structural purity of YF₃. VUV excitation and emission properties were explored using a VUV synchrotron radiation beam line. Downconversion of energy from VUV (157 nm) to visible light with quantum efficiency c. 189% was seen. This YF₃:Gd³⁺, Eu³⁺ phosphor would be an option for mercury-free fluorescence lamps.

KEYWORDS

downconversion luminescence, mercury-free fluorescence lighting, quantum cutting (QC), VUV spectroscopy

1 | INTRODUCTION

Downconversion luminescence is the phenomenon through which it is possible to obtain two or more visible photons for each VUV photon absorbed by the phosphor. Consequently, it will lead to luminescence quantum efficiency (QE) larger than 100% and better energy efficiency in lighting or display devices.^[1] This cognition was first projected by Dexter and later on verified in YF₃:Pr³⁺ with VUV excitation at 185 nm and QE of c. 140%.^[2-4] In subsequent research, some rare-earth ions, such as Pr³⁺, Tm³⁺ or Gd³⁺, showed a quantum-cutting phenomenon.^[5,6] It was concluded from the experimental results and prediction of Judd-Ofelt theory that further improvement in the efficiency of quantum-cutting phosphors using the single ion system was impossible.^[5] Further investigations^[7,8] have suggested that the ion pair Gd³⁺ and Eu³⁺ in a suitable host lattice results in QE greater than 100% under VUV excitation. The use of energy transfer (ET) between the sensitizer and activator in phosphors is well established and is one way to tune emission colour.^[9-12]

In the current report, results of downconversion luminescence for YF₃:Gd³⁺, Eu³⁺ synthesized using a soft chemical route and subsequent heating in a reactive atmosphere are presented. The resulting fine powder was tested for phase purity using an XRD technique. VUV excitation and emission properties were investigated through remote access of 4B8 VUV spectroscopy beam lines at the Beijing Synchrotron Radiation Facility (BSRF), Institute of High Energy Physics in Beijing, China.

2 | EXPERIMENTAL

Yttrium fluoride (YF₃) doped with Gd³⁺, Eu³⁺ was synthesized using a soft chemical route and subsequent heating in a reactive atmosphere. During synthesis, analytical grade oxide (Y₂O₃) was used as a precursor. The mixture of stoichiometric amounts of



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Energy Transfer Process in $\text{MgF}_2 : \text{Gd}^{3+}, \text{Eu}^{3+}$ Phosphor : Application to Visible Quantum Cutting

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ABSTRACT

Visible quantum cutting (QC) is observed in MgF_2 Co-doped with Gd^{3+} , Eu^{3+} phosphor synthesis via wet chemical method. Powder X-ray diffraction analysis shows structural purity. The emission and excitation spectra of $\text{MgF}_2:\text{Gd}^{3+}$, Eu^{3+} were investigated using the VUV beam line of the Beijing Synchrotron Radiation Facility (BSRF). Energy transfer in gadolinium compounds from the Gd^{3+} ions to Eu^{3+} through cross relaxation occurs in this process. Quantum efficiency was found to be greater than 100% under the excitation of 172 nm and 203 nm corresponding $^8S_{7/2} \rightarrow ^6G_J$ transition of Gd^{3+} ions. The synthesized phosphor material is potential candidates for the applications of plasma display panel and mercury free fluoresce lamps.

Keywords : Quantum Cutting, Plasma Display Panels (PDPs), VUV Spectroscopy

I. INTRODUCTION

For the development of mercury free florescent lamps and plasma display panels (PDPs), we require phosphor having quantum efficiency is greater than unity under VUV excitation. The phosphors having quantum efficiency is greater than unity are called quantum cutting phosphors. Quantum cutting provides a means to obtain two or more low energy photons for each high energy absorbed photon. Therefore it serves as a down converting (DC) mechanism with quantum efficiency greater than unity and it offers the prospect of providing enhanced energy effectiveness in lighting devices [1]. In order to obtain quantum-cutting phosphors with quantum efficiencies exceeding unity, the lanthanide ions are obvious candidates for this purpose due to their energy level structures that afford metastable levels

from which quantum-splitting processes are capable. [3-6]

II. METHODS AND MATERIAL


$\text{MgF}_2 : \text{Gd}^{3+}, \text{Eu}^{3+}$ phosphor was synthesis via reactive atmospheric process. In this method we used metal carbonate like MgCO_3 (99.99% A.R.) as a precursor. The inorganic magnesium carbonate was taken in Teflon beaker. A little amount of double distilled water was added in beaker and stired it, then hydrofluoric acid (HF) added in it to get slurry. The slurry was dried by blowing air or heating on hot plate (80°C). A freshly prepared MgF_2 host was obtained. Gd_2O_3 (AR 99.9%) and Eu_2O_3 (AR 99.9%) were boiled in HNO_3 and evaporated to dryness, so as to convert them into relevant nitrates. The aqueous



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Optically Stimulated Luminescence (OSL) properties of CaF₂: Ce phosphor for radiation dosimetry

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ABSTRACT

OSL technique is a now well-developed for its application in radiation dosimetry. Antonov Romanovskii *et al.* were firstly suggested use of OSL for personal dosimetry. However compared to thermoluminescence (TL) technique, Optically Stimulated Luminescence (OSL) is becoming more popular in radiation dosimetry. The polycrystalline CaF₂:Ce phosphor was successfully synthesized via Reactive Atmosphere Process (RAP). The structural properties of prepared phosphors were evaluated X-ray diffraction (XRD) technique. The XRD pattern of prepared phosphor well match with ICDD (International centers for diffraction data) file and synthesis methods were not affected on XRD pattern. The CaF₂:Ce³⁺ phosphor show good CW-OSL response under γ irradiation. The CW-OSL decay pattern of prepared CaF₂:Ce³⁺ phosphor is similar to the CW-OSL decay pattern of commercially available α -Al₂O₃:C phosphor. The photoluminescence (PL) excitation and emission spectra were observed at 305 nm and 338 nm, respectively. The effective atomic number (Z_{eff}) of CaF₂:Ce³⁺ is 16.3 and the phosphor is a candidate for radiation dosimetry.

Keywords : Reactive Atmosphere Process, Γ Irradiation, Effective Atomic Number, CaF₂:Ce³⁺ Phosphor.

I. INTRODUCTION

The OSL is one of the class of measurements known as stimulated phenomena. Such phenomena may be stimulated thermally (thermally stimulated phenomena or TSP) or optically (optically stimulated phenomena or OSP).

The use of OSL for radiation dosimetry was first suggested in 1955 by Antonov Romanovskii *et al.* [1]. It was later used by Braunlich *et al.* (1965) and Sanborn and Beard (1965) [2, 3]. The OSL technique had not

been used widely in radiation dosimetry until 1965, because of the lack of superior OSL materials. In 1990 Akselrod *et al.* reported TL properties of α -Al₂O₃:C crystal and found that TL sensitivity of α -Al₂O₃:C crystal was 50 times than LiF:Mg,Ti phosphor. Also α -Al₂O₃:C crystal showed excellent dosimetry properties such as low fading, dose threshold (μ Gy), a single peak at 460 K, emission band at 420 nm [4].

The OSL technique brought attention of scientific community for personnel dosimetry after the development of α -Al₂O₃:C because of its excellent OSL



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TO STUDY RELATIONSHIP BETWEEN BIOFILM FORMATION AND ANTIBIOTICS RESISTANCE OF GRAM POSITIVE COCCI ISOLATED FROM DENTAL CARIES

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ABSTRACT: Biofilm have been concerned as the main source of etiopathogenesis of dental caries, tooth decay and associated diseases. These biofilms establish a great challenge to the dental practitioner in the control and suppression of biofilm associated periodontal diseases and decaying of tooth. Out of these total 140 isolates, 98 isolates was found to be biofilm producer and 42 were biofilm non produces. These biofilm forming Gram Positive bacterial was identified by VITEK 2 instrument. Antibiotic resistance is one of the principal intimidations to worldwide health, food security and development. *Streptococcus mutans* along with most of the gram positive cocci was believed to be the major biofilm producer contributing in periodontal disease. In this article the relation between biofilm forming and antibiotic susceptibility of Gram positive cocci isolates was studied. Isolates from dental caries was identified and antibiotic sensitivity was also done by VITEK-2 compact system. *Streptococci* spp. has been showed to be significantly more resistance to antibiotic with the cause of tooth decay.

Key words: - Dental caries, Biofilm, VITEK 2, Gram positive cocci.

INTRODUCTION :

The buckle cavities have one of the maximum surface areas for microbial multiplication in human body. The dental biofilm forms initial selective adsorption of bacteria on tooth surface (Heller et al, 2015). The microflora existing in oral cavity is called oral micro flora. One of the commonly encountered problems in dentistry is loss of teeth and consequential replacement. Along with the restoration of function and aesthetic, removable prosthesis may change the oral ecology either qualitatively or quantitatively, such as increasing the total amount of oral microorganism (Azizah AL Mobereek, 2003). Oral health may lead to many oral problems such as formation of biofilm, dental caries, oral and facial pain, problems with the heart and other major organs, digestion problems and periodontal diseases. Periodontitis is frequent health difficulty caused by pathogenic biofilm forming bacteria that accelerates inflammation resulting in either reversible gingivitis or severe

periodontal damage, leading to loss of healthy tooth (Gutt et al, 2018).

Biofilm have been concerned as the main source of etiopathogenesis of dental caries, tooth decay and associated diseases. However biofilm can be removed by regular oral hygiene aids or specialized dental instruments, they have the capacity to set into dental calculus making their taking away too difficult. Consequently, these biofilms establish a great challenge to the dental practitioner in the control and suppression of biofilm associated periodontal diseases and decaying of tooth.

Dental caries is the localized destruction of dental hard tissue by acidic by products from dental plaque containing acid producing bacteria (Yu O et al, 2017). Establishment of a biofilm is a multifaceted progression that follows more than a few distinctive phases, commencing with adsorption on to the tooth surface of a habituation film derived from bacterial and host molecules finally results into tooth break or



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**Parental care in Insect Thrips
mycophagous Elaphrothrips sp
(Thysanoptera: Phlaeothripidae)**

Nagrle S.M.

Department of Zoology,
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ABSTRACT : The order Thysanoptera encompasses minute insects called Thrips which shows many peculiarities in their reproductive biology and parental behaviour. Elaphrothrips sp is a mycophagous thrips feed on the fungus infested dry leaves of host plant *Butea monosperma*. These thrips express a specific parental care which was usually not observed in phytophagous thrips. Sexual polymorphisms play an important role in behaviour. Parental care takes place by both male and female. In the present investigation observation on mating behaviour and parental care of mycophagous thrips are discussed. **Key words:** Elaphrothrips, parental care, social behaviour.

INTRODUCTION:

Elaphrothrips sp. is a mycophagous thrips are found within the curved folds of fungal infected dry leaves. They are feeds on fungal spores and generally occur on the fungus infected dry leaves of *Butea monosperma* plant. Comparatively to the other thrips, the size of adults Elaphrothrips sp is large. Sexes easily differentiates due to male is larger than female. Male having tarsal tooth on foreleg, while in female absent. Larvae are red in colour with black terminal tubes, occurs in colony and eggs are dull white in colour glued vertically on the leaf surface and in group. They are mostly available during month of September to November.

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Biochemical Study of Pyriform Silk of Spider *Nephila pilipes*

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Abstract

Female *Nephila pilipes* constructs a huge orb web between tall trees. Nearly rectangular, uniform and narrow mesh in capture area of *Nephila pilipes* web seems to be more efficient at intercepting prey. Pyriform silk is used as glue to form bonds between separate threads for attachment points. Nature evolved this well-designed adhesive before thousands of years which definitely provide important insights in designing new synthetic adhesives. The main goal of this study is to understand the biochemistry of this natural adhesive. In the present work, biochemical analysis of pyriform silk of *Nephila pilipes* was performed with the help of FTIR spectrum. The FTIR Spectrum of spider silk provided strong bands of photosensitive amide I, II and III regions. It also revealed the presence of different functional groups between amino acid residues in spider silk biopolymer. Spectrum confirmed presence of β sheets, β turns, random coil and α helix. These structures give typical outstanding mechanical properties to silk threads.

Keywords: *Nephila pilipes*, Spider silk adhesion, pyriform silk, biomaterial.

Introduction

Spider webs have attracted human attention for centuries. The fundamental unit of behaviour in the orb web spiders is the construction and design of the web [1]. Female *Nephila pilipes* constructs a huge orb web between tall trees. The main structural elements of an orb web of *Nephila pilipes* are the bridge line, the frame thread, the radii and the sticky or capture spiral. Each junction in the huge web is joined with a sliding connections i.e. attachment disc form by pyriform silk.



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Cylindrical Glands and Egg Sac Silk of Giant Wood Spider, *Nephila pilipes*

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Abstract: Different types of silk glands are located inside the abdomen of spider. Three pairs of cylindrical glands are developed in female giant wood spider, *Nephila pilipes*. In the present study, attempt have been made to explain the anatomy and histology of cylindrical glands and details of its spinning field with the help of scanning electron micrograph (SEM). The microscale topology and surface nanostructure of egg sac silk threads was studied with advance techniques of atomic force microscopy (AFM). It is concluded that, in female spider, cylindrical glands and egg sac silk produced by them plays a very important role in successful perpetuation of species. Roughness analysis of egg sac silk suggested that this biomaterial has high toughness that may be suitable for dissipating high amounts of mechanical energy. This silk is having high and stable mechanical performance. Hence, successful large scale production of this beautiful and strong, naturally pink colored spider silk will definitely open a new gate in textile sector.

Keywords: Nephila Pilipes, Cylindrical Glands, Egg Sac Silk, SEM, AFM.

I. INTRODUCTION

Different silk producing glands in spiders functions as small biofactories. In giant wood spider *Nephila pilipes*, two kinds of paired ampullate, three pairs of cylindrical, two pairs of aggregate, one pair of flagelliform, numerous pyriform and aciniform glands are found. All these glands are mainly tubular, end blindly and store specific types of silk in liquid form. Each gland leads to specific silk secreting outlet i.e. spinnerets which opens to outside in the form of tiny spigots.

Spider silks are formed from spidroins, a family of repetitive structural proteins [1]. Egg sac silk creates a protective layer against the trauma, as well as against predators and parasites [2], providing an approximate microclimate mediating against temperature and humidity fluctuations for embryonic development, hatching and subsequent molting and durable shelter for spiderlings [3]. The silk fibers of egg sac possess particular mechanical properties that allow the creation of a particular three dimensional structure. AFM is a nondestructive technique which can provide rich topographic images of the silk fiber. The micrometer and nanometer scales affect different aspects of cell behavior and different cell type react differently to different surface topography [4]. Hence, the surface roughness of egg sac silk fiber was observed and studied.

With the progress and development of science and technology, people's demand for superior performance materials is getting higher and higher, which puts forward higher requirements for the research work on natural spider silk bionic materials and related science. A large number of superior properties of spider silk bionic materials will replace traditional materials [5].

II. MATERIALS AND METHODS


The adult females of *Nephila pilipes* spider was dissected under Magnus Steriozoom binocular Microscope with camera attachment. Photographs of cylindrical glands were taken with FUJIFILM FINEPIX 52000 HD 10.0 megapixel 15X wide digital camera. Glands were fixed in Bouins fluid (fixative), dehydrated through ethanol series and cleared in xylene. After cold and hot embedding, these glands were blocked in molten paraffin wax. These tissues were serially

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Significance of Spiders in Agricultural Sustainability

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Abstract

The number of pests developing resistance to pesticides has been increasing at a very alarming rate. A wide range of spider species inhabit agricultural fields. They are very good predators as well as voracious feeders. Spiders consume large numbers of insect pest as prey. Aside from chemical control, predation is the only way to limit herbivorous pests. Spiders are excellent at this task. Spider plays an important role as biological regulators of insect population in agro ecosystems. Spiders act as buffer to limit pest populations in crop. Thus, the spider community would be a key component of integrated pest management strategies.

Key words: Spiders, predator, agriculture

Introduction:

Spiders are present in all habitats. These are important invertebrate predators within numerous ecosystems. Till date, 49878 valid spider species from 4238 genera are known from the world (WSC, 2022). Herbivorous insects such as aphids, caterpillars and weevils destroy a large quantity of the world's total crop production each year. Spiders are the most abundant natural enemy that occurs in most agroecosystems. Soil, especially agricultural soil is home to many spider species. They consume large number of prey items in croplands each year and help to keep voracious pests in-check. But conventional farming practices like tilling, crop residue removal and monoculture can harm

or drastically reduce these beneficial bio-control agents. For the past several years, there has been increased interest in the utilization of natural enemies, particularly the predators for the management of insect pests of crops.

Spiders in various agroecosystems:

Research on spider diversity in agroecosystems is highly valuable to observe the effect they have on herbivorous pests (Maloney et al., 2003). Spiders of families Araneidae, Salticidae, Oxyopidae, Philodromidae, Scytodidae, Uloboridae, Lycosidae, Linyphiidae, Tetragnatidae, Thomisidae, Clubionidae, Eresidae, Gnaphosidae, Hersilidae, Miturgidae, Sparassidae and Theridiidae etc are recorded with various agricultural fields in India (Deshmukh and Chaudhari, 2016; Asarkar and Ade, 2017; Vairale, 2020). They are proved to be important predators of pests of cotton, rice, apple, banana, orchards and various other crops and plantations. Varied food preferences by different genera ensured superior natural control against crop pests. Their prey searching ability and polyphagy makes them effective predators of crop pests. (Anitha G and Vijay J, 2016). During the last 50 years, numerous studies on the spider faunas in agricultural habitats have been published all over the world. Some of these are reviewed in following table.

Table-1: List of some literature on the spider faunas in agroecosystems in various countries

Country	Agro ecosystem	Authors
Australia	soybean	Pearce et al. (2004)
Brazil	sugarcane	Barbosa et al. (1979)
Canada	wheat	Doane and Dondale (1979)
Egypt	soybean	Hendawy et al. (2009)
France	apple orchards	Dib et al. (2020)
Germany	cereals	Yann et al. (2005)
India	grapevine maize orange cotton, banana, citrus	Sadana and Sandhu (1977) Sharma and Sarup (1979) Deshmukh and Chaudhari (2016) Asarkar and Ade (2017)
Japan	rice	Yamano (1977)
Korea	rice	Okuma et al. (1978)
Mexico	coffee	Miguel et al. (2006)
Pakistan	soybean, sunflower, Indian mustard	Riaz et al. (2017)
South Africa	strawberry	Dippenaar-Schoeman (1979)
Tamil Nadu	maize	Saranya et al. (2019)
U.S.A.	soybean	Culin and Rust (1980)

Nutritional physiology of spider:

Spiders feed on a variety of available

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Synthesis of pyrimidine linked heterocyclic scaffolds by intramolecular cyclization and study of biological potential

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Synthesis of some interesting pyrimidine linked heterocyclic scaffolds by intramolecular cyclization has been worked out. Initially compound (4,6-dimethyl-pyrimidin-2-yl-amino)-acetic acid hydrazide has been prepared by reacting 2-amino-4,6-dimethyl pyrimidine with ethyl chloroacetate, followed by condensation with hydrazine hydrate. It has then been treated with N-aryl/alkyl isothiocyanates, followed by intramolecular cyclization using alkaline ethanolic solution of I₂ with KI, *o*-phosphoric acid and aqueous KOH to afford respective heterocyclic compounds with differently substituted pharmacophores viz. (5-aryl/alkyl-amino-[1,3,4]-oxadiazol-2-yl-methyl)-(4,6-dimethyl-pyrimidin-2-yl)-amines, (5-aryl/alkyl-amino-[1,3,4]-thiadiazol-2-yl-methyl)-(4,6-dimethyl-pyrimidin-2-yl)-amines and (4-aryl/alkyl-5-mercapto-[1,2,4]-triazol-3-yl-methyl)-(4,6-dimethyl-pyrimidin-2-yl)-amines. Developments during the synthesis have been monitored by TLC. Constitution of synthesized compounds have been delineated in accordance with equivalent weight, elemental assay, chemical transformation and IR, ¹H NMR and mass spectral investigations. Title compounds have been tested for their biological potential.

Keywords: Synthesis, pyrimidine linked heterocyclic scaffolds, biological potential

As a heterocyclic compound, pyrimidine is supreme core structure with variegated therapeutic usage¹. Its utilization as a pharmaceutically dominant compound is evincive from its diversified biological characteristics. Like pyrimidine^{2,3}; derivatives of oxadiazole^{4,5}, thiadiazole^{6,7} and triazole^{8,9} are incorporated in pharmaceutical stuffs as anti-inflammatory, antitubercular, antiviral, antibacterial, antifungal agents^{10,11}, etc. These heterocyclic rings are also used as fundamental part of pharmacophores which have anticonvulsants¹²⁻¹⁴, antiproliferative^{15,16}, analgesics^{17,18} and other biological properties^{19,20}. Fusion of pyrimidine nucleus with these heterocycles proved to be excellent biological compounds^{21,22}. These diverse attributes of oxadiazole²³, thiadiazole²⁴ and triazole²⁵ nuclei have driven the interest to develop some interesting heterocyclic molecules with promising biological activities. As the presence of two or more bioactive rings within a single molecule enhances biological activity profile²⁶⁻²⁸, herein synthesis of pyrimidine linked heterocyclic scaffolds have been reported. To establish structure-activity relationship, synthesized compounds were evaluated for their antitubercular, antimicrobial potential and screened for insecticidal activity.

Results and Discussion

To begin with, compound ethyl-(4,6-dimethyl-pyrimidin-2-yl-amino)-acetate **2** was synthesized by reacting 2-amino-4,6-dimethyl-pyrimidine **1** (0.01 mol) with ethyl chloroacetate (0.01 mol) in 1,4-dioxane using anhydrous K₂CO₃ as catalyst¹ for 6 hr, followed by its condensation with hydrazine hydrate (0.01 mol) in 1,4-dioxane for 5 hr to afford (4,6-dimethyl-pyrimidin-2-yl-amino)-acetic acid hydrazide **3** (Scheme I).

Further, compound **3** (0.01 mol) was reacted with N-aryl/alkyl isothiocyanates **4a-h** (0.01 mol) in chloroform medium for 2 to 3 hrs to give (4,6-dimethyl-pyrimidin-2-yl-amino)-acetic acid N-(N'-aryl/alkyl-thioamido)-hydrazides **5a-h** (Scheme II).

Substituted hydrazides **5a-h** were separately reacted with alkaline ethanolic solution of I₂ with KI, *o*-phosphoric acid and aqueous KOH by dropwise addition of these reagents with constant stirring and allowing to stand at RT for specified time to undergo intramolecular cyclization and produce (5-aryl/alkyl-amino-[1,3,4]-oxadiazol-2-yl-methyl)-(4,6-dimethyl-pyrimidin-2-yl)-amines **6a-h**, (5-aryl/alkyl-amino-[1,3,4]-thiadiazol-2-yl-methyl)-(4,6-dimethyl-pyrimidin-2-yl)-amines **7a-h** and (4-aryl/alkyl-5-mercapto-



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Non-aqueous Potentiometric Estimation of Drugs Paracetamol and Aceclofenac in Double Component Pharmaceuticals

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Abstract

Non-aqueous potentiometric estimation of drugs paracetamol and aceclofenac in double component pharmaceuticals by the use of solvent isopropyl alcohol and titrant potassium hydroxide in isopropyl alcohol has been performed using a pair of platinum and saturated calomel electrodes. Drugs paracetamol and aceclofenac are distinctly acidic in nature. In medicines, there is wide use of these drug combinations. Non-aqueous potentiometric titration method has been found to be very much suitable and most accurate for assay of double component pharmaceuticals. Results obtained are comparable to those obtained by method given in Indian Pharmacopoeia (IP).

Keywords : Non-aqueous, potentiometric, paracetamol, aceclofenac, pharmaceuticals

INTRODUCTION

Non-aqueous potentiometric estimation by the use of different electrode pairs was reported in some communications¹⁻³. Various techniques, methods were suggested for the determination of combination drugs. These are mostly deals with separation of components present in drug followed by estimation of individual components with suitable technique. Estimation of combination drugs can be performed by different methods given in pharmacopoeias⁴⁻⁶. Estimation of combination drugs paracetamol-barbitone, paracetamol-salicylamide, paracetamol-aspirin by differentiating potentiometric titrations have been reported earlier^{2,7-9}. Estimation of double and triple component mixtures of drugs paracetamol-aceclofenac and paracetamol-aceclofenac-chlorzoxazone have been found to be performed earlier by the techniques viz. spectrophotometry and chromatography^{10,11}. Determination of paracetamol-aceclofenac combination drug by non-aqueous potentiometric titration using a pair of platinum and saturated calomel electrodes and solvent isopropyl alcohol was not so far reported. Both the drugs paracetamol and aceclofenac are distinctly acidic in nature, so owing to their hydrolysis, these could not be titrated directly with aqueous alkali. Again basic titrants are superior to the alkoxide solvents, which are more susceptible to the atmospheric moisture and carbondioxide.

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**A Review on Phytochemicals of Nutraceutical importance in *Illicium verum* (Star-Anise), the major spice from Indian cuisine**

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Abstract:

Plants play an important role in everyday life. We cannot imagine life and its growth without plants. Besides food, plants are a primary source of material for other necessities of life. The traditional medicinal practices are important parts of the primary healthcare system in the developing as well as the developed world. Herbal medicines are comparatively safer and cheaper than synthetic drugs. The plant-based traditional knowledge has become a recognized tool in search for new sources of drugs and nutraceuticals. *Illicium verum*, as a spice and pharmaceutical treatment of many harmful diseases, has been widely used in most Asian countries. In the present study, the review focuses mainly on food and phytochemical applications of *Illicium verum*. The fruits are commonly used as an ingredient of the traditional “five-spice” powder for cooking, and the essential oil of *I. verum* can be used as a flavouring. The extraction from *I. verum* has carminative, stomachic, stimulant, and diuretic properties, and is used as a pharmaceutical supplement. Shikimic acid extracted from *I. verum* is one of the main ingredients in the antiviral drug Tamiflu, which is used to fight avian influenza. It has also been reported to possess antimicrobial and antioxidative properties as well as significant anticancer potential. This review presents a detailed study on the phytochemical properties of *Illicium verum* which plays an important role in nutrition.

Keywords: *Illicium verum*, acetone, ethyl acetate, TLC**Introduction**

Despite of tremendous progress in human health care system, the infectious diseases caused by microorganisms are still a major threat to the public health. Nature has provided an important source of remedies to cure all the ailments of mankind. In the recent years, all the medicines used were from the natural source, especially from the plants. Plants contain hundreds or thousands of metabolites. Medicinal and aromatic plants, a gift of nature, are being used against various infectious diseases in the world since the past history. Thus the ancient wisdom has been the basis of modern medicine and therapeutics.

Illicium is the sole genus in the family of Schisandraceae. It comprises of forty two species of evergreen shrubs and small trees. The species of native is from the tropical and subtropical regions of Eastern and South Eastern Asia, South Eastern North America and the West Indies. The most frequently occurring species are *Illicium dunnianum*, *Illicium graffiti*, *Illicium verum* and *Illicium anisatum*. *Illicium verum* is commonly known as star anise or star aniseed or Chinese star anise (Kumar et al.2012). A common Asian cuisine ingredient, star anise's popularity is steadily growing. It is a spice that closely resembles anise in flavours obtained from the star shaped pericarp of *Illicium verum*. It is a medium sized native evergreen small or medium sized tree of subtropical and temperate regions. *Illicium verum* has been used in a tea as the traditional remedy. They consist of star-shaped fruits, which are reddish-brown in colour and contain 6–8 carpels attached in a whorl arrangement. The shape and size of the carpel is boat-shaped and 10 mm long, also contain a seed. The seeds are brown coloured, ovoid shaped, and possess smooth, shiny, and brittle texture. This plant is propagated by its seeds for its application in different types of medicines, perfume, and as a culinary spice in India, southern China and Vietnam. The fruits are harvested before they ripen, and sun drying is done for further use. Anethole, is the main ingredient found in Star anise, that gives the unrelated anise its flavour, hence it has become a less expensive substitute for anise in baking as well as in liquor production, most distinctively in the production of the liquor Galliano. The fruits are commonly used as a spice, and the seeds are sometimes chewed after the meals to aid the digestion. Star anise has many culinary uses like, enhances the flavour of meat, the major component of *garam masala* and used as a spice in the preparation of *biryani* and *masala chai*. Traditionally, dried seedless fruit is used as incense. It is used for sweet fragrance while preparing butter-salted tea or sugar tea. Besides these properties, it is also gaining importance in the natural health world due to the medicinal values of phytochemicals present in the fruits. These plants have been extensively used for the treatment of infectious diseases in traditional medicine. The fruit consists of essential, as well as volatile oil. Traditionally, the fruit has been used as carminative, digestive, dyspepsia, antispasmodic, stimulant, anti rheumatic, and diuretic. The paste/powder of Star anise is used to treat rheumatism and nostalgia, and is

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Artificial Intelligence Using Neural Network Based D. S. S. For Iris Detection

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Abstract:-

Neural network-based decision support system, is used for persons identification from IRIS recognition. In this case DECISION SUPPORT SYSTEM (D.S.S.) will work as a classifier estimate non linear and complex decision boundaries between different classes. The neural network configuration using MLP, RBF, SVM. The various parameter of neural network will be varied carefully in order to obtained the optimal configuration in view of minimum mean square error and maximum classification accuracy and simplicity of neural network model, the available data set ratio of these partition will varied gradually. In each of neural network configuration. The variable parameter test and train by neural solution software.

Finally an optimal neural network based D.S.S. will be designed in each category of neural network and then shall be overall comparison among different neural network configuration. In this case of decision support system confusion matrix and classify accuracy are important to identify person iris image.

Keywords: Iris recognition, neural network-based decision support system, Classify accuracy, MLP ,RBF, SVM

Introduction:-

Today's E-Security are in critical need of finding accurate, Secure and cost-effective alternatives to passwords and personal identification numbers as financial losses increase dramatically year over year from computer-based fraud such as computer hacking and identity theft. Biometric solutions address these fundamental problems, because an individual Biometric data is unique and cannot be transferred Biometric is automated methods of identifying a person or verifying the identity of a person based on physiological or behavioral characteristic.

For Example, of physiological char. Include hand, finger image and facial characteristic and iris recognition behavioral char. Are trends which can be learn or acquired dynamic signature verification, speaker verification and key stroke dynamic are example of behavioral char. Biometrics system uses a hardware to capture the Biometric information and software to maintain and manage the system in general, the system translates these Biometric profile known as template that templates is stored in a data base the Biometric system then compares this templates to the new image created every time a user accesses system then compares this templates to the new image created every time a user accesses the system for an enterprise Biometric provides value into two ways Biometric adds a unique identification to network authentication, one that is extremely difficult to duplicate smart cards and token also provides a unique identifier but an Biometric has an advantage over these devices a user cannot lose or forget his or her finger print, retina or voice the practical application for Biometric are diverse and expanding and range from healthcare to govt, financial services, transportation and public safety and justice. Such application are on line identification for E-commerce access control of a certain building or restricted area, offline personal identification, financial automated teller machine (ATM), online ticket purchase etc.

Feature Extraction

In order to provide an accurate recognition of an individuals, the most discriminating information present in an iris pattern has been extracted. Only the significant features of the iris have been encoded so that comparison between templates is done. the feature extraction stages.

Development of 16 Element linear array transducer Using Field-II

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Abstract: Piezoelectric transducers are significant elements of many broadband ultrasonic systems, either pulse-echo or through-transmission, used for imaging and detection purposes. In ultrasonic broadband applications such as medical imaging, or non-destructive testing, piezoelectric transducers should generate/receive ultrasonic signals with good efficiency over a large frequency range. This implies the use of piezoelectric transducers with high sensitivity, broad bandwidth and short-duration impulse responses. High sensitivity provides large signal amplitudes which determine a good dynamic range for the system and the short duration of the received ultra-sonic signal provides a good axial resolution. This paper presents the simulation of linear array transducers for ultrasonic measurements.

Keywords--Ultrasonic, Linear array Transducer, medical imaging, Field-II GUI, TX/RX Fields, detected image, TX/RX Axial slice, TX/RX Axial slice.

I. INTRODUCTION

For the period of the second half of 20th current century the medical imaging is grown through Ultrasound tool speedily. The part of novel technology is the use of computers to decide problems by simulating theoretical models (Numerical simulations) that has taken place alongside pure theory and experiment during the last few decades. These numerical simulations permit one to resolve problems that may not be accessible to direct experimental study or too complex for theoretical analysis. Computer simulations can link the gap between analysis and experiment [1].

These numerical simulations have emerged as a new branch in science and technology complementing both experiments and theory. A simulation can sometimes replace physical experiments, even though most often a simulation and an experiment are complementary. The



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**Nanoparticles of hepta-O-benzoyl- β -D-maltosyl thiocarbamates:
Synthesis and Characterization**

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Abstract:

Applications of the N-linked sugar isothiocyanate and isocyanate have gained considerable attention in recent years due to its unique characters. On the basis of experiences gained recently from work being carried out in the laboratory , it appeared quite interesting to carry out the synthesis of nanoparticles of new N-linked Maltose Thiocarbamates and their derivatives by the reaction between Maltosyl isothiocyanate and various alcohols. The characterization of new compounds and biologically made nanoparticles has been carried out by Melting point, antimicrobial activity, usual chemical transformation, NMR, IR and Mass spectral studies.

Keywords : Maltose, Thiocarbamates, Nanoparticles,

Introduction :

Day by day the field of carbohydrates becomes widely spreading because of its enormous interactions and cell-cell recognition, cell growth, fertilizations and immune responses. Nanoparticles play very important role in the development of novel diagnosis methods and in the advanced design of drug delivery system^{1,2}. Silver nanoparticles and Gold nanoparticles particularly, shows an excellent anti-microbial properties and hence are rapidly being used in to medicines etc. to increase the lifestyle of human being and beneficial for mankind and environment^{3,4}. Glyco-nanoparticles shows several advantages such as their synthesis can be performed under biomimetic conditions result in nanoparticles without traces of chemicals responsible for adverse cellular responses and carbohydrates which are on the surface can act as targeting molecules and trigger cellular uptake via specific receptors or mediate specific cellular responses⁵. Derivatives of Carbohydrate have been reported as inflammatory, analgesic, fungicidal, herbicidal & pesticide agents⁶⁻⁸. Because of the tremendous biological importance, carbohydrates are very essential to our daily lives. They have more importance in synthesis and medicinal chemistry^{9,10}. Maltose is the second member of an important biochemical series of glucose chains. Maltose, or malt sugar, is a disaccharide formed from two units of glucose joined with an α (1 \rightarrow 4) linkage. Maltose is not common in food, but can be formed from the digestion of starch and is heavy in the sugar in malt, the juice of barley and other grains. Nanotechnology as defined by size is naturally very broad, including field of science as diverse as surface science, organic chemistry, molecular biology, semiconductor physics, energy storage, micro fabrication, molecular engineering etc.

Isothiocyanates and isocyanates are a group of very reactive chemical compounds. Once they have reacted, the resulting product is usually less harmful than the chemical itself. This chemical is used in the manufacture of carbamates and thiocarbamates. Due to high reactivity towards compounds containing active hydrogen atom isocyanates and isothiocyanates are one of the most versatile classes of functional groups. They are important intermediates; the chemistry of these molecules is dominated by the nucleophilic addition reaction. The high yields and lack of byproducts with this type of reaction have led to their commercial exploitation in the polymer



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A Systematic Investigation of Nanoparticle Synthesis of 1-Tetra-O-Acetyl -B-D-Glucosyl-3-aryl Thiocarbamide

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Abstract:-

In recent years, nanotechnology is an escalating field of modern research involving synthesis design, characterization, production, and application of structures, devices, and systems by controlling shape and size at the nanometer scale. Nanotechnology also involves the synthesis of nanoparticles. These compounds arouse interest as potential biologically active substances and versatile intermediates for preparing various derivatives. To achieve the principle of green chemistry process, it leads to the search for green synthesis of nanoparticles. Here we have synthesized 1-Tetra-O-acetyl-B-D-glucosyl -3-aryl thiocarbamide by reaction of Tetra-O-Acetyl-B-D-glucosyl isothiocyanate with various aryl amines. The identities of newly synthesis compounds have been established based on usual chemical transformation and U.V, IR, NMR, Mass and Particle Size analysis Analytical studies.

Keywords: TAG Isothiocyanate , Aryl Amines and Tetra-O-acetyl-B-D-glucosyl -3-aryl thiocarbamides nanoparticles.

Introduction:-

Described as the manipulation of atomic matter, nanotechnology was described theoretically in the 1960s by Richard Feynman, and the practice emerged a decade later. After Taniguchi's, Drexler's, and other scientist's valuable contributions, nanomedicine has developed [1,2] and recently, the three main applications of nanomedicine are in tissue engineering, nanoprobe, and nanoparticles for drug delivery. The field of nanotechnology is one of the most active research areas in modern materials science. Nanoparticles exhibit new or improved properties based on specific characteristics such as size, distribution, and morphology. There have been impressive developments in the field of nanotechnology in the recent past years, with numerous methodologies developed to synthesize nanoparticles of particular shape and size depending on specific requirements. New applications of nanoparticles and nanomaterials are increasing rapidly.

Nanotechnology, as defined by size, is naturally very broad, including the field of science as diverse as surface science, organic chemistry, molecular biology, semiconductor physics, energy storage, microfabrication, molecular engineering, etc. The associated research and applications are equally diverse, ranging from extensions of conventional device physics to completely new approaches based upon molecular self-assembly, from developing new materials with dimensions on the nanoscale to direct control of matter on the atomic scale. Nanotechnology may create many new materials and devices with various applications, such as in Nanomedicines, Nanoelectronics, and biomaterial energy production and consumer products.

Lipid-based Nanoencapsulation systems are useful in the properties of antioxidants. It enhances the performance of antioxidants just by improving their solubility. Antioxidants



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Synthesis and Characterization of Nanoparticles of β -D-lactosyl Thiocarbamates

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Abstract:

The study includes the synthesis of nanoparticles of Lactosyl thiocarbamates and its derivatives. It appeared interesting to carry out the synthesis of nanoparticles of following Lactosyl thiocarbamates by the reaction of Lactosyl isothiocyanate with alcohols. The characterization of new thiocarbamates and biologically made nanoparticles has been carried out by usual chemical transformation, NMR, IR and Mass spectral studies and the characterization of prepared nanoparticles were done by antimicrobial activity, melting point difference, X-ray diffraction and U. V. spectroscopy.

Keywords : Thiocarbamates, nanoparticles, lactose

Introduction:

Nanotechnology as defined by size is naturally very broad, including field of science as diverse as surface science, organic chemistry, molecular biology, semiconductor physics, energy storage, micro fabrication, molecular engineering etc. Highly reactive nature of *N*-linked sugar isothiocyanate and isocyanate appears to promise its great applicability in the synthesis of thiocarbamates and carbamates which find the wide spread use in the combinatorial library synthesis as well as in pharmaceutical industries. Isothiocyanates and isocyanates are a group of very reactive chemical compounds. Once they have reacted, the resulting product is usually less harmful than the chemical itself. This chemical is used in the manufacture of carbamates and thiocarbamates. Due to high reactivity towards compounds containing active hydrogen atom isocyanates and isothiocyanates are one of the most versatile classes of functional groups. The high yields and lack of byproducts with this type of reaction have led to their commercial exploitation in the polymer field, agrochemicals and pharmaceuticals. Reactions with carbon nucleophiles provide a useful synthetic access to substituted amides and other derivatives.

Sugar isothiocyanates rank among the most versatile synthetic intermediates in carbohydrates chemistry¹⁻³. They plays a vital role in the preparation of a broad series of functional groups such as thioamides⁴, isonitrile, carbodiimide and *N*-thiocarbonyl derivatives⁵⁻⁷ allowing, simultaneously, the covalent coupling of a quite unrestricted variety of structures to the saccharide part. More ever, isothiocyanates are important reagents in heterocyclic chemistry⁸⁻⁹ which may be exploited in the synthesis of nucleosides¹⁰ and other *N*-glycosyl¹¹⁻¹² structures. Dialdehyde starch nanoparticles are useful carrier for anticancer drug because of their small size, good thermal stability, low biological toxicity and slowly anticancer drug releasing to strengthen drug effect¹³.

Experimental :

Determining the difference between melting point of compounds and their nanoparticles is one way to test if the nanoparticle is prepared or not. So the M.P. of compounds and their nanoparticles has been taken using melting point apparatus. The prepared Compounds and their nanoparticles have been screened for antimicrobial activity using Cup plate agar diffusion



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SYNTHESIS AND CHARACTERIZATION OF NANOPARTICLES OF B-D-LACTOSYL THIOCARBAMATES

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ABSTRACT

Antimicrobial activity address the crucial problem of increasing microbial resistance against antibiotics. The study includes the comparison of synthesized nanoparticles of Lactosyl thiocarbamates & Lactosyl thiocarbamides with its bulk. It appeared interesting to carry out the antimicrobial activity, which shows the improvement in Lactosyl nanoparticles than bulk one. The characterization of new thiocarbamates and biologically made nanoparticles has been carried out by usual chemical transformation, NMR, IR and Mass spectral studies and the characterization of prepared nanoparticles were done by antimicrobial activity, melting point difference, X-ray diffraction and U. V. spectroscopy.

Keywords— Thiocarbamates, thiocarbamides, nanoparticles, lactose

I. INTRODUCTION

In recent years, there has been a considerable interest in the field of Nanotechnology. As defined by size is naturally very broad, including field of science as diverse as surface science, organic chemistry, molecular biology, semiconductor physics, energy storage, micro fabrication, molecular engineering etc. Highly reactive nature of N-linked sugar isothiocyanate and isocyanate appears to promise its great applicability in the synthesis of thiocarbamates and carbamates which find the wide spread use in pharmaceutical industries. Has the potential to make a great impact on human health, ranging from prevention to diagnosis and treatment of disease. Antimicrobial activity tests confirms how effective a drug is. The application of nanotechnology in medicine Isothiocyanates and isocyanates are a group of very reactive chemical compounds. Once they have reacted, the resulting product is usually less harmful than the chemical itself. This chemical is used in the manufacture of carbamates and thiocarbamates. Due to high reactivity towards compounds containing active hydrogen atom isocyanates and isothiocyanates are one of the most versatile classes of functional groups. The high yields and lack of byproducts with this type of reaction have led to their commercial exploitation in the polymer field, agrochemicals and pharmaceuticals. Reactions with carbon nucleophiles provide a useful synthetic access to substituted amides and other derivatives.

Sugar isothiocyanates rank among the most versatile synthetic intermediates in carbohydrates chemistry¹⁻³. They plays a vital role in the preparation of a broad series of functional groups such as thioamides⁴, isonitrile, carbodiimide and N-thiocarbonyl derivatives⁵⁻⁷ allowing, simultaneously, the covalent coupling of a quite unrestricted variety of structures to the saccharide part. More ever, isothiocyanates are important reagents in heterocyclic chemistry⁸⁻⁹ which may be exploited in the synthesis of nucleosides¹⁰ and other N-glycosyl¹¹⁻¹² structures. Dialdehyde starch nanoparticles are useful carrier for anticancer drug because of their small size, good thermal stability, low biological toxicity and slowly anticancer drug releasing to strengthen drug effect¹³.

II. EXPERIMENTAL

Determining the difference between melting point of compounds and their nanoparticles is one way to test if the nanoparticle is prepared or not. So the M.P. of compounds and their nanoparticles has been taken using melting point apparatus. The prepared Compounds and their nanoparticles have been screened for antimicrobial activity using Cup plate agar diffusion method. By measuring zone of inhibition in mm antimicrobial activity has been studied. By using DMSO as a solvent the concentration of compound were 1 mg/ ml. Amikacin (100 µg/ml) was used as a standard. Compounds were screened for antimicrobial activity against microbes (listed in table 2) in nutrient agar medium. H1 NMR data of the compounds were measured using CDCl₃ solvent on 300 MHz frequency. And their chemical shift values are in (ppm) units using TMS as a reference. IR spectral data of the compounds were recorded on FTIR-RXI spectrophotometer. Confirmation of products and reaction progress carried out by TLC using Hexane : Ethyl acetate solvent system and identification of spots carried out by using iodine chamber, UV chamber and KMnO₄ spray.

III. METHOD OF PREPERATION

Step 1 : preparation of Lactose Octabenzoate: 55 ml dry Pyridine and 55 ml dry Chloroform were taken in a 1 lit. tight cork glass bottle and cooled in an ice-salt bath. To this solution previously prepared cooled solution of 55 ml Benzoyl Chloride in 55 ml dry Chloroform was added with constant stirring. To this mixture 20 gm. of dry powder of Lactose was added in small instalments with constant stirring by maintaining the temperature



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A Efficient Synthesis of Nanoparticle of Some Benzothiazoles Derivative of Glucose

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Department of Chemistry,

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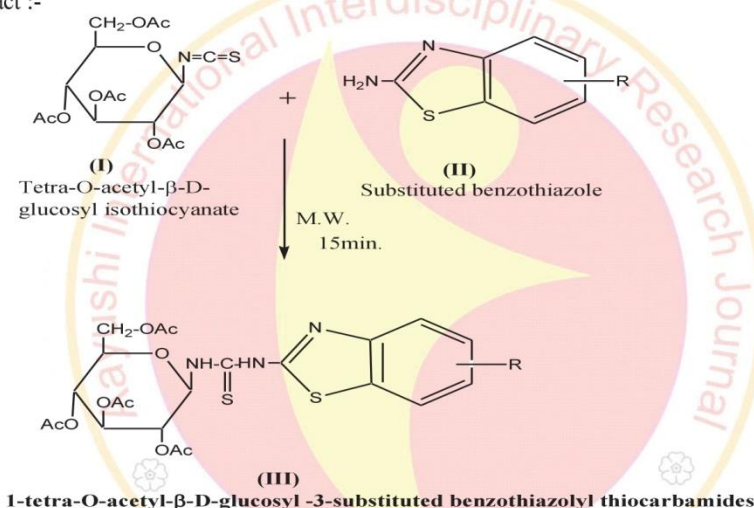
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Abstract :-

Benzothiazoles have played an important role in the field of biochemistry and medicinal chemistry due to their highly pharmaceutical and biological activity. The development of synthetic processes is undoubtedly one of the most significant problems facing researchers. Nanotechnology also involves the synthesis of nanoparticles. These compounds arouse interest as potential biologically active substances and versatile intermediates for preparing various derivatives. To achieve the principle of green chemistry process, it leads to in search of green synthesis of nanoparticles. Here we have synthesized 1-Tetra-O-acetyl-β-D-glucosyl-3-(2)- benzothiazolyl thiocarbamides by reaction of Tetra-O-Acetyl-β-D-glucosyl isothiocyanate with various substituted benzothiazole. The identities of newly synthesis compounds have been established based on usual chemical transformation and U.V, IR, NMR, Mass and Partical Size analysis Analytical studies.

Keywords: TAG Isothiocyanate , substituted benzothiazole and 1-Tetra-O-acetyl-β-D-glucosyl-3-(2)- benzothiazolyl thiocarbamides nanoparticles.

Graphical Abstract :-



Introduction :-

Benzothiazole is a representative class of sulfur-containing heterocycles and involves a benzene ring fused to a thiazole ring. The benzothiazole ring system was originally found in various marine and terrestrial natural compounds, which is widely used as vulcanization accelerators, antioxidants, plant growth regulators, anti-inflammatory agents, enzyme inhibitors, imaging reagents, fluorescence materials, and electroluminescent devices due to its highly pharmaceutical and biological activity [1,2,3,4]. Especially, benzothiazole plays an important role in the field of medicinal chemistry and renders an extensive range of biological activities including anti-cancer [5,6], anti-bacterial [7,8], anti-tuberculosis [9,10], anti-diabetic [11], anthelmintic [12], anti-tumor [13,14,15], anti-viral [16,17], anti-oxidant [18], anti-inflammatory [19,20], anti-glutamate and anti-parkinsonism [21], anticonvulsant [22], muscle relaxant activities [23], neuroprotective [24], inhibitors of several enzymes and so on [25]. Hence, the synthesis of benzothiazoles is of considerable interest due to their potent and significant biological activities and great pharmaceutical value.

Nanotechnology, as defined by size, is naturally very broad, including the field of science as diverse as surface science, organic chemistry, molecular biology, semiconductor physics, energy storage, microfabrication, molecular engineering, etc. The associated research and applications are equally diverse, ranging from extensions of conventional device physics to completely new approaches based upon molecular self-assembly, from developing new materials with dimensions on the nanoscale to direct control of matter on the atomic scale. Nanotechnology may create many new materials and devices with various applications, such as in Nanomedicines, Nanoelectronics, and biomaterial energy production and consumer products.



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Phytochemical Analysis of Some Medicinal Plants Used in Improving Stomach Function and Correcting Gastro-Intestinal Disorders

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ABSTRACT

The traditional medicine involves the use of different plant extracts or the bioactive constituents. This type of study provides the health application at affordable cost. Secondary metabolites are responsible for medicinal activity of plants. Hence in the present study phytochemical screening of some important medicinal plants was carried out. Qualitative phytochemical analysis of these plants confirm the presence of various phytochemical like saponins, terpenoids, steroids, flavonoids, tannins, quinones, alkaloids. The results suggest that the phytochemical properties for curing various ailments. The plants under investigation showed their medicinal potential and can be source of useful drugs.

Key Words- Phytochemical screening, Medicinal plants, Secondary metabolites, Tannins, Steroids.

I. INTRODUCTION

Medicinal plants have been used for centuries as remedy for human diseases because they contain the compounds of therapeutic values. Gastro- intestinal disease includes, the disease of esophagus, stomach, duodenum, jejunum, ileum, theileo-cecal complex, large intestine (ascending, transverse, and descending colon), sigmoid colon and rectum. The plant kingdom has proven to be the most useful in the treatment of diseases and they provide an important source of all the worlds pharmaceuticals. The most important of these bioactive constituents of plants are steroids, terpenoids, carotenoids, flavonoids, alkaloids, tannins and glycosides. Plants in an facet of life have served a valuable starting material for drug development. Antibiotics or antimicrobial substances like saponins, glycosides, flavonoids and alkaloids etc. are found to be distributed in plants, yet these

compounds were not well established due to the lack of knowledge and techniques. The Phytoconstituents which are phenols, anthraquinones, alkaloids, glycosides, flavonoids, and saponins are antibiotic principles of plants. From these phytoconstituents, saponins have been reported to exhibit hemolytic and foaming activity, antifungal, anti-inflammatory, fungistatic, molluscidal.

II. MATERIAL AND METHODS

The plant material was collected from the Akola region and identified taxonomically in the department of Botany, Shri R.L.T. College of Science, Akola. The fresh seeds of the plants *Butea monosperma*, rhizome of *Curcuma longa* and rhizome of *Zingiber officinale* were air dried at room temperature until dried. The dried seeds of each plant were crushed to obtain powder These powdered

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Ethno- Veterinary Plants Used in Animal Health Care Practices by Livestock Owners From Katepurna Region Dist- Akola (M.S.) India**Khadse P. M.¹ and Kakpure M. R.^{*2}**¹Department of Botany, Shri RLT College of Science, Akola^{*2}Department of Botany, L. R. Bharti Arts, Commerce & S. S. R. Bharti Science College, Arni, Dist-Yavatmal**Abstract**

Livestock economy forms a major part of our agriculture economics. Tribals in far flung rural areas are still depending upon plant and household remedies for curing various veterinary ailments. The folk knowledge of ethno-veterinary significance has been identified by tribals through a process of experience over hundreds of year. The present study throws a light on herbal remedies used in animal health care of Katepurna region district Akola, Maharashtra, India. The paper deals with 15 diseases of domestic animals and their treatments by 50 plant species found in close vicinity of the rural peoples of the study area.

Key Words: Domestic animals, herbal medicines, animal healthcare and Katepurna region.

Introduction

In India enough attention has not been given to the traditional veterinary herbal remedies (Boddings, 1927; Bandyopadhyay *et al.*, 2005 and Prajapati & Kumar, 2005). The use of plant and animal parts for medicines long been in existence and documented in records kept in ancient China, India and Egypt. These ancient indigenous practices were discovered by a series of trial and error which then could not be substantiated by proven scientific theories. However, these practices have produce result of proven efficacies compared to conventional modern medicines (Chopra *et al.*, 1956 and Prajapati *et al.*, 2003).

In recent times, herbal medicines have become indispensable and are forming an integral part of the primary health care system of many nations. There has been rich tradition and indigenous knowledge about animal healthcare in India (Raja Reddy, 1987; Sharma, 1993 and Bhattacharjee, 2001). Modern healthcare in the tribal and rural areas of Katepurna region is characterized by the deficiency of infrastructure, of qualities personal and of medicine. So, the present study was undertaken in rural as well as in forest areas of Katepurna in Akola district.

Methodology

The traditional knowledge of plant base remedies for the treatment of ailments rests with the medicine man, all of which belong to one family of hereditary indigenous practitioners. Skill and experiences are passed on from one generation to the next by word of mouth and guarded like secrets. In view of secretiveness of traditional men and women, it was decided to interview a number of elderly people, who have a great deal of practical knowledge about the plants and animal products used as medicine in the native system. Before actually launching into the field work, rapport was established with tribals of the locality. Experienced people, such as some elders, professional healers, medicine men can provide important information on useful medicinal plants.

To determine the authenticity of information collected during field work, repeated verification of data from different people and at different times was done. The collected plants were identified up to species level with the help of flora (Kamble & Pradhan, 1988; Karthikeyan & Kumar, 1993; Naik, 1998; Singh & Karthikeyan, 2000 and Singh *et al.*, 2001). The information presented includes the name of ailment, plant parts, animal product or chemical used, their scientific names and mode of usage. The data are presented alphabetically disease and disorder wise.

Observations

In all 50 plant species are used by the natives in the treatment of domestic animals.

- 1] Anorexia:** 50 gm tuber powder of *Corallocarpus epigaeus* Rottl.et Willd. mixed in 250 ml wine is given in anorexia for Loss of appetite.
- 2] Bloat:** Leaves of *Ocimum basilicum* L. crushed with sugar and the decoction in water is given for blood purification. Tuber of *Discorea bulbifera* L. rubbed in cow urine and paste is applied over bloat. Inflorescence of *Mangifera indica* L. crushed in cow urine and the paste applied thrice a day on bloat. Tuber paste of *Corallocarpus epigaeus* Rottl.et. willd. Clarke made in cow urine administered over bloat.
- 3] Blood purification:** Agents believed to remove impurities or deficiencies from blood. Leaves of *Ocimum basilicum* L. crushed with sugar and the decoction in water is given for blood purification.



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Evaluation of Antibacterial and Antioxidant Properties of Indigenous Cow Urine

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ABSTRACT

The article was emphasized on evaluation of antibacterial and antioxidant potential of indigenous cow urine. Cow urine collected from rural area undertaken for analysis to establish antibacterial and antioxidant activity using agar well diffusion as well as DPPH assay. The zone of inhibition against test bacterial strains and DPPH assay has revealed promising results which confirms that the cow urine as a potent therapeutic agent. The presence of lipase enzyme in urine makes it highly potential anticancer agent which can be detected by performing thin layer chromatography (TLC) and titrimetric method.

Keywords: Cow urine, antibacterial activity, antioxidant activity etc.

I. INTRODUCTION

The medicinal importance of cow urine (Gomutra) is well described in Ayurveda. Cowpathy is a treatment (in Ayurveda medicine) based on products obtained from cows called Panchagavya [1]. The use of Panchagavya in preparing medicinal and agricultural products are effective, eco-friendly and free from toxic effect to mankind. Recently cow's urine is being used as an effective medicine under cowpathy which is capable of curing blood pressure, thyroid, blockage in arteries, asthma, constipation, diabetes respiratory disease and certain types of cancer [2-5].

Cow urine contain N, S, Fe, Si, Cl, Mg, Na, citric salt, succinic salt, calcium salt, vitamin A, B, C, D, and E, lactose, creatinine, hormones, urea and enzymes. It heightens the fact that cow urine is free from toxicity and contains 95% of water, 2.5% urea and remaining 2.5% a mixture of salts, hormones, vitamins and enzymes [6]. The main component in urine is urea known as micro-organismskilling agent thus is used as effective antiseptic for skin diseases, wounds and beside this enzymatic action of urine can cure the various diseases including cancer [7, 8]. Cow urine enhances secretion of interleukin-1 and interleukin-2, as well as phagocytic activity of microphages and thus helps in the control and prevention of infections [9]. Nowadays, different preparation of cow urine like photoactivated urine, urine distillate and fresh urine have been marketed as a reedy to get rid of various infections [10].

Cow urine is believed to have used in many drug formulations and also as a radical scavenging activity. The free radicals in our body damage the cell and its cellular components therefore it causes genetic disease.

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Physico-chemical analysis of Pus Dam water of Pusad town

Pravin Kawle

Research Laboratory of Chemistry, Shri R. L. T. College of Science, Akola

Abstract

The present water quality assessment study has been carried out on water quality of Pus Dam belongs to District Yavatmal of Maharashtra. Pus Dam is considered as drinking water source for Pusad town and many habitats. For this study, water samples collected from the from three different sites have been evaluated for its physicochemical parameters such as temperature, pH, turbidity, phosphate, chlorides, nitrates, dissolved oxygen, biological oxygen demand, total dissolved solids and total hardness etc. The parameters analysed in the months of November and December 2021 and results showed that physicochemical parameters were within the permissible limits with marginal concern and could be used for drinking and irrigation purpose.

Introduction

Water is a fundamental natural resource and most essential necessity to both natural ecosystem and human life. The natural water bodies are strength of plant and a source of energy for living organisms, healthy aquatic life is also depends on the quality of water.[1] . In general water pollution occurs due to the city sewage and manmade waste discharge into water bodies which affects on aquatic ecosystem and human beings. The condition for the ecology of living organisms provides significant information about the available water resource supporting the aquatic life or not supporting due to manmade pollution.[2]

The water pollution occurred due to human activities like idol immersion, which releases non-biodegradable pop, toxic paints into water body and get poisonous. The human activity of immersing such material into water bodies results falling of oxygen level of water to 50%.[3] The water of Pus Dam is utilises for agriculture and also as a drinking water source for Pusad town. Therefore, it is essential to monitor physico-chemical parameters to check the magnitude and source of any pollution load and to suggest appropriate conservative measures.[4-5] For this study we reviewed some work, information in relation to physico-chemical analysis of water in the Pus Dam is not extensively studied, thus study was conducted in the months of November and December 2021.[6]

Therefore, present study is carried out to revealed the status of pollution of Pus Dam in terms of physico-chemical analysis.

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Prevalence of Sickle Cell Anemic Subjects from Gadchiroli District, Maharashtra, India

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¹Shri R.L.T. College of Science, Akola, M.S., India

²Janata Mahavidyalaya Chandrapur M.S., India

Abstract: Sickle cell disease is caused by Mutations in the HBB gene. Hemoglobin consists of four protein subunits, typically, two subunits called alpha-globin and two subunits called beta-globin.

People with sickle cell anemia suffers with high morbidity and with many intercurrent infections, people of study district are with high economic burden, terminate fatality in childhood state and have the emotional and psychological trauma including the family members the exact magnitude of the problem in the study district is still obscure.

The study conducted from April 2009 to April 2012 to know the prevalence of sickle cell anemia by month long survey and by visiting all PHC'S and RH of district and data collected to know the prevalence of sickle cell trait and sickle cell disease total 7763 cases were recorded in present study and age wise, gender wise and caste wise distribution recorded and the data was analyzed statistically.

Keywords: Sickle, anemia, Gadchiroli, Haemoglobin, beta-globin

I. INTRODUCTION

Sickle cell anemia is known to the medical world since the discovery of this entity by Dr. James Herrick, (1910) a Chicago cardiologist. The highest frequency of causative gene of sickle cell anemia is in tropical Africa it occurs with lower frequency in Mediterranean basin, Saudi Arabia and parts of India. In India high frequencies of sickle cell gene is reported from states of Orissa, Maharashtra, Madhya Pradesh, Gujarat, and parts of Kerala (Kaur *et al.*, 1997, Shah 2004, Chhotray *et al.*, 2004). In central India the maximum number of cases of sickle cell anemia is seen in Mahar, Gond, Teli, and Kunbi. It is estimated the sickle cell gene is prevalent in 75 districts (in various states) in India. Before this century most of the individual with sickle cell anemia died before the reproductive age. Sickle cell trait has its highest prevalence in areas endemic for malaria suggested that Hb-S offered selective removal of sickled from the circulation probably reduces degree of parasitemia and substantially limits the infection process. In India first case of sickle cell anemia was reported by Lehman and Cutbush, 1952 and later by Jain *et al.*, 1981 and thereafter awareness of this was increased. Various aspects of this disease including peculiar prepaundance in few communities have been studied. In India this condition is common among certain tribes in south India, Asam, Bihar, and Orissa. In Maharashtra it is reported in specific communities as well as community from Gujarat (Shah, 2004). The incidence of sickle cell gene is high in communities like Mahar, Kunbi as reported by Shukla and Solanki, (1958) incidence of sickle cell anemia in black population is also high.

II. MATERIAL AND METHODS

The study conducted in Gadchiroli district, located Latitude 20° 10' 56.66"N and Altitude 80° 0' 11.46" E, of Maharashtra with population of 9 to10 lakh where most of the area is covered by dense forest having a major population of Gond and Madia tribes. The study conducted from April 2009 to April 2012 to know the prevalence of sickle cell anemia by month long survey and by visiting all PHC'S and RH of district and data collected to know the prevalence of sickle cell trait and sickle cell disease total 7763 cases were recorded in present study and the data was analyzed statistically.

III. OBSERVATION AND RESULTS

A. Age Wise Distribution

Data was collected and analyzed statistically, in the present study total Hb-AS were found to be 6638 (85.51%), and 1125 (14.49%) Hb-SS of total affected population. In patients with Hb-AS (carrier) in age group of 0 to 10 years were 1460 (21.99%) and in Hb-SS (sufferers) were found to be 333 (29.6%). In age group of 11 to 15 in Hb-AS were 1279 (19.26%) and in Hb-SS were 201(17.86%). Between age group of 16-20 year Hb-AS were 1075 (16.19%) and Hb-SS were 194 (17.24%). In age group of 20 years above patients in Hb-AS were 2824 (42.54%) and in Hb-SS were 397 (35.28%) (**Table - 1, Fig-1**).



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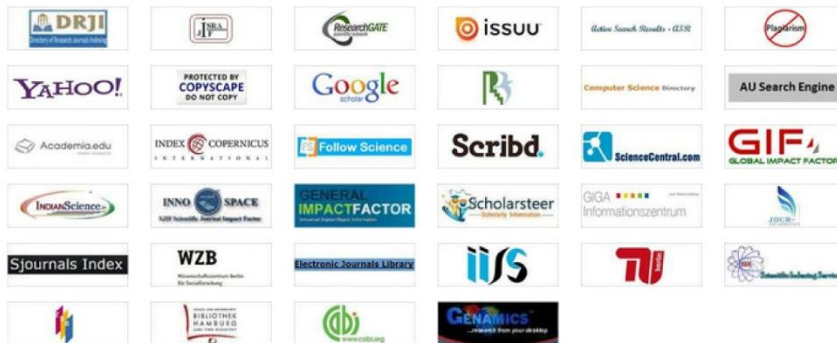
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In Vitro Antimicrobial Activity Of 3-Thio-4-Aryl-5-Tolyl-[1, 2, 4]- Dithiazolidines [Hydrochloride]

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ABSTRACT

A series of novel 3-thio-4-aryl-5-tolyl-[1, 2, 4]-dithiazolidine [hydrochloride] have been synthesized by the interaction of several Ammonium aryl dithiocarbamate with *N-p*-tolyl-*S*-chloro isothiocarbamoyl chloride in refluxing chloroform medium. These compounds were screened for their antibacterial and antifungal activities against–*E. coli*, *P. vulgaris*, *S. aureus*, *S. typhimurium*, *K. pneumonie*, *Ps. aeruginosa*, *A. niger* and *C. albicans*. The newly synthesized compounds have been characterized by analytical and IR, ¹H NMR and Mass spectral studies.

I. INTRODUCTION

Any chemical substance inhibiting the growth or causing the death of micro-organisms is known as antibacterial agent. Chemical substances are used for treatment of diseases and have been known since the 1500's. The chemical substances used for the treatment of infectious diseases and diseases caused by the proliferation of malignant cell are called as chemotherapeutic agents. Antibacterial drugs that destroy bacteria or stop its growth. An antibiotic is a chemotherapeutic agent that stops the growth of micro-organisms, such as bacteria, fungi or protozoan's. "Antibiotic" is considered to be a substance which is anti-bacterial, anti-fungal, or anti-parasitical. It is very important to know the specific mechanism by which chemotherapeutic agents inhibit or kill micro-organisms. This information has wide application. It may suggest some chemical entity as superior drug e. g. similar compounds but with some modification in its configuration. It provides better understanding of the cell. More often than not, chemotherapeutic agents have been discovering by screening experiments i. e. by trial or error. New chemotherapeutic agents are intensively investigated in order to establish their mode of action.

Dithiazolidine constitutes a major role in the synthesis of various heterocyclic moieties. They act as active precursors in synthetic heterocyclic chemistry. Synthesis of a series of novel five member ring containing nitrogen and sulphur are well known¹. A small heterocyclic ring containing nitrogen and sulphur have been under investigation for a long time because of their important properties. Synthesis, structural properties and antimicrobial activities of various [1, 2, 4]-dithiazolidine have been reported earlier². The literature survey revealed that the [1,2,4]- dithiazolidine have been found to possess potent anti-tumors, anti-tuberculosis³, anti-diabetic and anti-cancer⁴ and anti inflammatory⁵ properties.

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SYNTHESIS AND SPECTRAL STUDY OF SUBSTITUTED-[1, 2, 4]-DITHIAZOLIDINES [HYDROCHLORIDE]

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India

Abstract: Newly synthesized 3-thio-4-aryl-5-tolyl-[1, 2, 4]-dithiazolidine [hydrochloride] have been prepared by the interaction of several Ammonium aryl dithiocarbamate with N-p-tolyl-S-chloro isothiocarbamoyl chloride in refluxing chloroform medium. The newly synthesized compounds have been characterized by analytical and IR, ¹H NMR and Mass spectral studies.

Keywords: Ammonium aryl dithiocarbamate, N-p-tolyl-S-chloro isothiocarbamoyl chloride, -[1, 2, 4]-dithiazolidine

Introduction: Dithiazolidine constitutes a major role in the synthesis of various heterocyclic moieties. They act as active precursors in synthetic heterocyclic chemistry. Synthesis of a series of novel five member ring containing nitrogen and sulphur are well known¹. A small heterocyclic ring containing nitrogen and sulphur have been under investigation for a long time because of their important properties. Synthesis, structural properties and antimicrobial activities of various [1, 2, 4]-dithiazolidine have been reported earlier². The literature survey revealed that the [1,2,4]- dithiazolidine have been found to possess potent anti-tumors, anti-tuberculosis^{3,4}, anti-diabetic and anti-cancer⁵ and anti inflammatory⁶ properties.

Thiocarbamides and their heterocyclic

derivatives have gained recently much interest as inhibitors of Human Immunodeficiency Virus (HIV)⁷ and Therapeutic agents⁸. Some of the heterocyclic derivatives of thiocarbamides are found to possess diverse pharmacological activities like antifungal and anti-tubercular agents. In view of utility of thiocarbamides, N-aryl-S-chloro isothiocarbamoyl chloride have been used in synthesis of substituted [1, 2, 4] dithiazolidine by interacting with Ammonium aryl dithiocarbamates. The drug containing 1, 2, 4-dithiazolidines show a diverse range of physiological activities, antimicrobial⁹⁻¹⁰, anti-inflammatory¹¹⁻¹³, anti-ulcer¹⁴⁻¹⁵, and anti-cancer¹⁶. Here is reported the synthesis of several 3-thio-4-aryl-5-tolyl-[1, 2, 4]-dithiazolidine [hydrochloride] (3a-d) have been synthesized by the interaction of several Ammonium aryl dithiocarbamate (1a-d) with N-p-tolyl-S-chloro isothiocarbamoyl chloride (2). The required Ammonium aryl dithiocarbamate (1a-d) were obtained by the interaction of interaction of different amines with carbon disulphide and Ammonia.

Results and discussion

Several 3-thio-4-aryl-5-tolyl-[1, 2, 4]-dithiazolidine [hydrochloride] (3a-d) have been synthesized by the interaction of several Ammonium aryl dithiocarbamate (1a-d) with N-p-tolyl-S-chloro isothiocarbamoyl chloride (2). in CHCl₃. After condensation, the solvent was distilled off to obtain a sticky residue. This residue was triturated several times with petroleum ether (60-80°C) to afford a pale yellow solid (3a-d). The product was found to be non-desulphurrizable when boiled with alkaline lead acetate solution. The IR spectra of products shows bands due to Ar-H, C-H, C=N, C-C, C-N, C=S, C-S, S-S stretching and ¹H NMR spectra of products distinctly displayed signals due to aromatic protons and Acetyl protons. The Mass spectrum of product was also observed. The identities of these new 3-thio-4-aryl-5-tolyl-[1, 2, 4]-dithiazolidine [hydrochloride] have been

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“Synthesis, Characterization and Spectral Interpretation of 1-tetra-O-Benzoyl- β -D-glucosyl-5-aryl 2,4 dithiocarbamide”

Kavita M. Heda^{1*}

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ABSTRACT

Serial of the “1-tetra-O-Benzoyl- β -D-glucosyl-5-aryl 2,4 dithiocarbamide” was prepared by the interaction of the of Tetra-O-Benzoyl- β -D-glucosyl isothiocyanate and Phenyl thiocarbamide in Benzene Medium. The Reaction was refluxed for 3-hours in benzene medium and the benzene is evaporated and then the product is recrystallised by the petroleum ether (60-80⁰C). The identities of these new compounds have been established on the basis of usual chemical transformations and IR, ¹HNMR and Mass spectral studies.

The polarimetric study of all compounds was carried out. The study of S- and N-glycosides is important in carbohydrate chemistry. Sugar isothiocyanate is good precursors and versatile intermediate for synthesis of S- and N-glycosides. Carbohydrates play an important role in the number of biological events and play an important role in their synthetic strategy as well. Similarly the amino sugars are an important class of glycosidase inhibitors and are arousing great interest as potential therapeutic agents.

Key words: Glucosyl isothiocyanate, Phenyl thiocarbamide, 2,4 dithiocarbamide etc.

INTRODUCTION

Isothiocyanates are important intermediates belonging to the family of compounds known as heterocumulenes. Isothiocyanates are versatile synthetic intermediates in organic chemistry due to their availability and their tendency to undergo nucleophilic addition and cycloadditions¹⁻³. Literature survey reveals that synthesis of amino, diamino derivatives which exhibit biological and pharmaceutical activities such as antimicrobial effect^{4,5}. Acylureas and biurets are noncyclic compounds which upon replacement of one or both oxygen with sulphur results into the formation of thiobiurets and dithiobiurets respectively. Isodithiobiuret derivatives⁶⁻⁷ shows potent biological activities such as anticonvulsant, hypnotic, analgesic, antifungal, insecticidal activity. Glycosyl thiourea has been widely

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**IN VITRO GERMINATION OF DIFFERENT VARIETIES OF GOSSYPIUM POLLEN GRAIN****Sangole A.A.**

Department of Botany, Shri R.L.T. Science College, Akola, Maharashtra, India

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ABSTRACT

Cotton is one of the most commercial crops playing a key role in economic, political and social affairs of the world. To alleviate environmental stress-related yield reductions, a better understanding of the relative sensitivities of pollen development, dehiscence, pollen germination, pollen tube growth, fertilization, and subsequent boll development is needed. Number of pollen grains viable to germinate at the time of germination after their deposition on stigma is an important event in the process of fertilization leading to formation of fruits and seeds. Progress in identifying the sensitivities of these developmental stress responses has been hampered in part by the lack of a rapid and reliable method of germinating *Gossypium* varieties pollen in vitro. Since pollen grains of a large number of species readily germinate *in-vitro* on a simple medium, *in-vitro* germination has been extensively used in studies on structural and physiological details of germination and tube growth.

Keywords: *Gossypium* flower anther, sucrose, boric acid, calcium nitrate and magnesium sulphate, and micro slides.

1. INTRODUCTION

Palynology, a term coined by Hyde and Williams [1] means the science of pollen and spore. The basic palynology can also be referred investigation of pollen and spore dispersal preferably by wind and water. Understanding the Palynology of commercially important crop plants like cotton is an important aspect of investigations. The *Gossypium* is botanical name of cotton. Cotton is a valuable crop plant. It is used as a textile fiber because of their mature dry hairs, which is twisted in such a way that the fine & strong thread can be spun from them.

Number of pollen grains viable to germinate at the time of germination after their deposition on stigma play very important role in the process of fertilization leading to formation of fruits and form seeds. Germination of pollen grain is the first morphogenetic process for its function to transport & discharge of sperm cells into embryo sac.

The whole process of pollen germination and tube elongation is demarcated into four phases namely inhibition phase, lag phase, tube initiation, and rapid elongation phase. In some varieties pollen grains starts to germinate as soon as they reach the stigma, if condition of temperature and humidity are favorable. Several numbers of tubes may emerge from a single

pollen grain [2]. Mostly, at the time of pollen germination it produces single pollen tube. Since pollen grains of a large number of species readily germinate *in-vitro* on a simple medium, *in-vitro* germination of pollen grain has been extensively used in the studies of the structural and physiological details of the germination and tube growth. Two celled pollen grain in generak are more amenable to in vitro germination as compared to three celled pollen. Numbers of methods have been used for the *in vitro* germination and it has been comprehensively describe by Shivanna and Rangaswamy [3]. Detail processes involved in the pollen germination and tube growth are of the paramount importance. In *in-vitro* germination of the pollen grain is the most frequently used method for checking the viability of the pollen grain [4].

2. MATERIAL AND METHODS

For *in-vitro* pollen germination dehisced anthers from matured flowers of selected cotton varieties were collected. *In vitro* pollen germination of pollen grain was carried out in different media such as, sucrose, boric acid, calcium nitrate and magnesium sulphate with 10%, 20%, 30%, 40%, and 50% concentrations. The micro slides of pollen grains prepared in different concentrations were observed under compound

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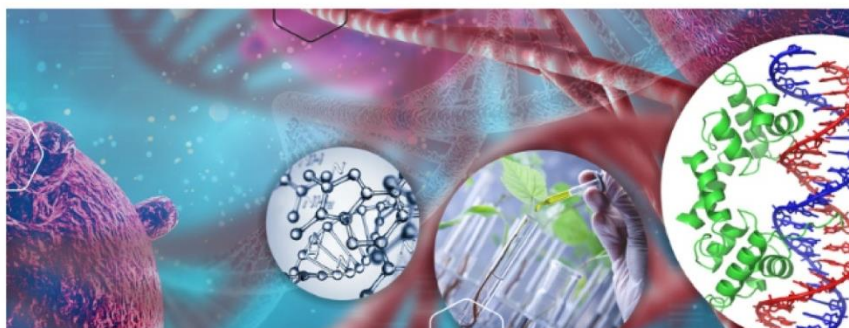
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Abstract:

Phenology is the study of timing of vegetative activities, flowering and fruiting and their relationships to environmental factors. "Flowering Phenology" refers to the seasonal timing of flowering. Another event under phenology is opening of flower, anther dehiscence, pollen presentation and stigma receptivity. Flower opening in all cotton varieties starts during 06.45 to 09.45 hours followed by anther dehiscence, which starts, from 07.00 hours depending on the weather conditions. In all selected varieties of cotton, it is observed that the flowering starts during 1st to 19th of September and full blooming was from 9th October to 28th November. In histochemical test, Pollen grains of all the varieties of cotton studied showed the presence of both starch and lipids. Thus the Pollen grains of all cotton varieties belong to the class of starchy pollen as in all varieties it showed positive test.

Keywords: Cotton varieties, flowers, starch, lipids, phenology.

Introduction:

Cotton is one of the most commercial crops playing a key role in economic, political and social affairs of the world. Cotton is a tropical and subtropical crop grown on a variety of soil. The predominant types of soil on which the crop is grown are the black cotton soil and red sandy loams to loams found in the state of Gujarat, Maharashtra, Madhya Pradesh, Andhra Pradesh, Karnataka and Tamilnadu. The sowing season of cotton varieties differs considerably in different regions for obtaining maximum yield of cotton. The crop yield is depending on reproductive success of the plant. During the process of reproduction the pollen grains plays very important role. Therefore, the Palynological investigations of cotton varieties H-8, NHH-52, BT-162, LRA-5166, Kaveri Kurnel, Ankur-216, Binni and Ajeet-11 were proposed to undertake for the investigations on flowering phenology, pollen histochemistry. Phenology is the study of timing of vegetative activities, flowering and fruiting and their relationships to environmental factors (Mori and Prance, 2005). "Flowering Phenology" refers to the seasonal timing of flowering.

A phenological record depends on parameter chosen by the various investigators and depends on the research levels, the aim of the research, and the type of analysis. The main events are the timing, duration, sequence, intensity and timing of flowering, which can determined by the physical environment factors like temperature, rainfall and day- length (Dafni, 1992). Plants reproductive characteristic can affect the flowering phenology, mode of seed dispersal and fruiting seed set efficiency. A wide variety of environmental factors may select for one or more reproductive characteristic in plant population (Smith *et al.*, 1986) and such factors include seasonal climatic events (Schemske, 1977).

Pollen histochemical analysis are carried out for the following reasons i) possible relation between the pollen content and the mode of pollination ii) study of pollinator foraging behavior, nutritional demands, pollination mode, pollen content and iii) composition in relation to phylogeny (Dafni, 1992). Lipids and starch are important constituents of the pollen grains to establish the relations with flower foragers.

Materials and Methods

For the collection of phenological data of selected cotton varieties, field trips were undertaken daily or on alternate days. Events and the changes of the single flower are recorded to study the flowering phenology in relation to geographical (latitudinal and altitudinal) and climatic variables, the time and duration of pollen exposure and the interrelations among environmental variables (temperature and humidity) and flower development were noted.

Plants were observed from the beginning of flowering stage up to the opening of last flower. Flowering period was taken as the period from the opening of first flower up to the opening of last flower. The timing of onset, progress, termination and blooming of selected varieties under study were noted.

For the histochemical tests fresh and mature pollen grains were collected from freshly dehisced anthers. For the test of starch method proposed by Baker and Baker (1979) was followed. Pollen samples were immersed in to IKI solution and examined under the microscope for the change in colour. Dark bluish-black color indicates the presence of starch. For the estimation of lipids pollen sample were kept in freshly prepared stock solution of Sudan IV and treated pollen sample was observed under microscope within 2-3 minute to note the change in colour. A red color indicates the presence of lipid (Baker and Baker, 1983).



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Review on Challenges of Sentiment Analysis

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ABSTRACT

Now in this internet era everything is available in the form of websites, blogs, social networks, e-commerce etc. so there is a importance of reviews, opinions, feedbacks by users. These feedbacks generated by users plays important role for business, individuals, governments. Here comes the role of Sentiment Analysis on the basis of feedbacks given by users. But there are several challenges facing the sentiment analysis and its evaluation process.

In this paper presents different perspectives of challenges occurs while finding the accuracy and extract subjective information from text for sentiment analysis and defining its polarity.

Keywords: Sentiment Analysis, emotion analysis, social media, Sarcasm, Multilingual data, text mining, Machine Learning

I. INTRODUCTION

Nowadays with the increasing use of the internet a lot of information is available on the web which is about the different products, movies, books, technologies etc. People express their views, opinions etc on the different products, services, books etc. on the web or social media.

The sentiment found within comments, feedback or critiques provide useful indicators form any different purposes. Sentiment Analysis is a task under natural language processing which finds orientation of a person opinion or feelings over an entity. Sentiment analysis is an ongoing research field. In Sentiment analysis based on the sentiment value it is decided whether the sentence is positive, negative or neutral. This helps a lot when need to rely on people's opinion. But there several challenges for analyzing correct sentiment behind the feedback, opinion so it must to understand and found solution on these challenges of sentiment analysis. [1][2][3]

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Differential Haemocyte Count (DHC) in Silkworms *Bombyx Mori* During Pathogenic Diseases in Akola District (MS)

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Department of Zoology,
Shri R.L.T. College of Science, Akola, India

Raja I. A

B.S. Patel College, Pimplegaonkale, India

Abstract

Differential haemocyte count was studied in Silkworm *Bombyx mori* larvae infected by pathogenic diseases Grasserie and Flacherie in Akola district. DHC in silkworms infected with, Grasserie, and Flacherie recorded significant changes in the 5 cellular types [Prohaemocytes (PR), Plasmacytes (PL), Granular cells (GR), Spherule cells (SP), and Oenocytoids (OE)] at early infection i.e. on second day with Grasserie and with Flacherie as compared to control healthy non infected worm of the same developmental stage. However, late infection i.e. on day five of the 5th instar larva, these diseases led to a more significant changes in DHC as compared to non infected healthy silkworms of the same developmental stages. The values obtained for the DHC of the 5 cellular types in Grasserie infected silkworm larvae, with the relative frequency of these cells determined as (PR > GR > SP > PL > OE), in Bacterial Flacherie infected silkworm larvae, with the relative frequency of these cells were recorded as (PR > GR > SP > PL > OE) and the values obtained for the DHC of the 5 cellular types in Viral Flacherie infected silkworm larvae, with the relative frequency of

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WATER VAPOURS SENSING MECHANISM BASED ON BaTiO₃ DOPED ZnO NANOCOMPOSITE THICK FILMS SENSOR

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ABSTRACT

The ZnO and BaTiO₃ nanoparticles were synthesized by a co precipitation method. The structural and compositional characterization has been studied by using X-ray powder diffraction (XRD). The sensors are made in the form of thick film. The Surface morphologies of the prepared samples were analyzed using Field Emission Scanning electron microscopy (FE-SEM) for thick film. Further, Water vapour or humidity sensing investigations of these sensing materials were done. Our result indicates that ZnO- BaTiO₃ in form of thick film sensor with different molecular weight ratio was most sensitive for humidity in comparison to pristine material under same conditions. The hysteresis plot between increasing and decreasing the RH range from 30-90% RH and vice versa has been studied. The samples resistance of ZB1 decreases 10¹⁰ Ω to 10⁶ Ω in comparison with the pristine materials. The similar change was also observed in sensitivity.

Keywords: ZnO, BaTiO₃, Humidity chamber, XRD.

1. INTRODUCTION

Humidity sensors are generally used in various fields such as medical equipment, food production and industrial and in various agricultural processes. The materials that are developed as commercial humidity sensors comprises, organic polymer films, porous ceramics, electrolytes and various composites. As compared with the other sensing materials, ceramic metal oxides have shown various rewards such as, mechanical strength, resistance to the chemical attack, thermal and physical stability and rapid response to humidity, etc. Therefore, it is necessary to give the attention on developing new sensor materials. The humidity can be measured by change in the resistance, capacitance and thermal conductance [1]. There are many materials have been investigated in view of their potential use as humidity sensing elements based on polymers, ceramics and composite materials [2-10]. Ceramic humidity sensors are to be preferred to the rest due to their thermal, physical and chemical stability [11]. The nanocrystalline materials gain much interest due to their novel structural, electrical and optical properties that significantly differ from the bulk solid state due to the influence of quantum confinement [12,13]. Humidity sensing elements based on ZnO have also been studied [14-16]. The impact of different

dopant on the characteristics and parameters of ZnO-based elements and the properties of ceramic and thick film humidity sensors [17,18]. BaTiO₃ has been usually used because of its wide band gap and outstanding dielectric and ferroelectric properties, infrared detectors, piezoelectric transducers, electro-optic devices, ferroelectric memories, and humidity-gas sensor [19-20].

2. EXPERIMENTAL

2.1. Synthesis of Zinc Oxide (ZnO) nanoparticle

In this, ZnO Nanoparticle were synthesized by co precipitation method, using Zinc acetate dehydrate Zn(O₂CCH₃)₂(H₂O)₂, sodium hydroxide as preliminary materials. Initially, 0.2M Zinc Acetate dehydrates was dissolved in 100 ml de-ionized water was ground for 15 min and then mixed with 0.02 M solution of NaOH with the help of glass rod. The mixed solution was magnetic stirred for 15 min at constant temperature and then again it was ground for 45 min. The white precipitate product was occur at the bottom. Then abundant liquid was removed and the product was washed several times with the de-ionized water and methanol to remove by products. The final product was then filtered and it was kept in a vacuum oven at 90°C for 5 hrs. The moisture will removed from the final

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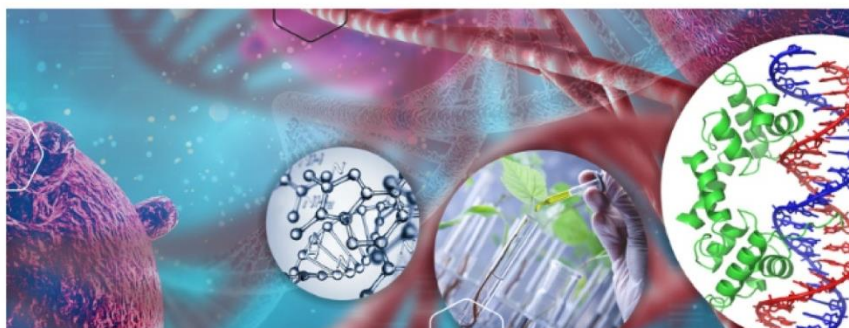
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Dielectric Constant Properties of UV- irradiated Pure and Polyblends Polystyrene- Polyvinyl acetate Thin Films

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Abstract

The main objective of this study is to determine the dielectric constant (ϵ_r) of UV-radiation irradiated pure PS (polystyrene), pure PVAc (poly vinyl acetate) and Polyblends of PS-PVAc at varying temperature and also at the different frequencies (1 KHz to 1MHz) using 4284 LCR source meter. It is found that the dielectric constant varies with the temperature of pure and blends. From the results, it was also attributed that as these polymer thin films are exposed to UV radiation, their dielectric constant varies with temperature.

Keywords: Polystyrene (PS), Polyvinyl acetate (PVAc), Polyblends of PS-PVAc, Dielectric constant, UV-radiation

1. Introduction

Polymer blending is one of the most important contemporary ways for the development of new polymeric materials. Polymeric materials are exclusively recognized by its uses of day-today life as well as in high-technology industries such as electronics, aerospace and medicine. So polymeric materials have been in the greater scope through research interest in the past few years because of their importance in applications in many areas. The correlation between their atomic structures and their behavior towards various properties has been studied extensively theoretical and experimental approach for many years. The electrical and structural properties of polymeric material studied by using different type of solvents during the synthesis process of polymeric materials. Beth A. Miller-Chou *et al* [1] studied effects of various solvents on extensive properties of synthesized material. So it remarkable that the properties of the solvents used in synthesis processes are very critical for surface formation in of these polymer material. Solvent properties such as polarity, volatility and specific interaction properties with the polymer material are very important factors in the process of the surface formation and defect formation. The polymer blends composition of polystyrene (PS) and poly (vinyl acetate) (PVAc) have been widely investigated. "The copolymer of PS and PVAc is a typical amphiphilic system in which the PS segment is hydrophobic and the PVAc segment is hydrophilic" [2]. Remarkable research has been performed on the graft copolymer of PS and PVAc, including their micelle behavior.

Mohammed M. Kummali *et-al* studied the phase separation process of the polymer blend thin films and also synthesized polystyrene in toluene at a 4% solution concentration. Atomic forced microscopy of polystyrene gives meticulous information about the topographical features and the mechanical phase shift imaging of the sample. This phase shift can be correlated with specific mechanical properties which affect sample interaction confirmed by quantitatively measuring the value of the dielectric permittivity [3-4].

The present paper focused on studies of solvent effects in AC electrical conductivity and dielectric constants at different temperatures of polyblends (PS-PVAc). The solvent plays a very crucial role while mixing two or more different types of polymer material.

2. Experimental

Poly (styrene) and Poly(vinyl acetate) were supplied by SIGMA –ALDRICH, Co., 3050 spruce street, St. Louis. MO 63103 USA 314-771-5765. Tetrahydrofuran (THF-E-Merck India Ltd., Mumbai) is being used as a solvent for poly-blending process. In the present work, thin films were prepared by isothermal evaporation technique.

2.1. Preparation of Blends

Poly (styrene) and poly (vinyl acetate) were dissolved in tetrahydrofuran (THF). Stirring was continued for one hour before deposition of film. The total concentration of the polymeric mixture in solvent was kept 5%. Films of polymer blends were prepared by isothermal evaporation technique.

2.2. Measurements

The ac frequencies were applied (in the range 1 KHz –1 MHz) across the all samples by using the 4284 A precision LCR source meter (20 Hz –1 MHz) [Agilent Technologies, Singapore].

3. Results and Discussion

3.1. Dielectric Constant Studies

Synthesized Unexposed polymer thin films which were named as pure PS (Sample-I), pure PVAc (Sample-II), Polyblend of PS-PVAc (Sample-III) and UV-irradiated (expose) polymer thin films were named as pure PS UV-irradiated (Sample-IV), pure PVAc UV-irradiated (Sample-V), Polyblend of PS-PVAc UV-irradiated (Sample-VI).

Figure 1(a, b and c) shows the relation between dielectric constant(ϵ_r) and frequency at different constant temperatures 313K, 323K, 333K and 343K. Plot shows rise in dielectric constant with increasing temperatures. The rise of dielectric constant due to increasing temperature is a common respond for polymeric samples [5-6].



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Water vapour sensing mechanism of pristine SnO₂ nanoparticle based thick film sensor

R M Agrawal

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Abstract

The SnO₂ was synthesized by co-precipitation method. The gross structure and phase purity of the pure SnO₂ nano powder were examined by powder X-ray diffraction technique. It reveals that the sample crystallize in tetragonal structure. The surface morphology investigated through field emission scanning electron microscope (FE-SEM) results that pure SnO₂ possesses uniform grains and is almost homogeneously distributed, which indicates the high packing density of the materials and nano spheres like structures. Further, Water vapour or humidity sensing investigations of pristine SnO₂ nano powder were study. Our result indicates that pristine SnO₂ in form of thick film was most sensitive for humidity under same conditions. The hysteresis plot between increasing and decreasing the RH range of 30–90% Rh and vice versa. The samples resistance decreases from 10¹¹ Ω to 10⁸ Ω. The similar change was also observed in sensitivity. The response and recovery time were also studies. The results were re- producible up to ± 79% after 2 months of observations.

Key words: SnO₂ nanoparticle, Humidity sensor.

1. Introduction

Humidity plays a significant role in every part of the Earth in biology factors and varrious industrial processes. To have a desirable surrounding atmosphere, it is essential to monitor, detect and control the ambient humidity under different conditions ranging from low temperature to high or in combinations with other gases by precise and provident sensors [1,2]. Due to the different operating conditions of moisture sensors in different areas of application ranging from indoor to open air uses, various types of humidity sensing instruments have been developed based on different work principles and diverse hygroscopic sensing materials [3-5]. The operating principle of metal oxide semiconductor sensors is based on the change in conductivity of the sensitive layer by the chemical adsorption of molecules. Typically, the metal oxides semiconductors (SnO₂, In₂O₃, WO₃, ZnO, etc.) are used to create sensitive layers [6-8]. Tin oxide is an n- type wide band gap semiconductor (Eg = 3.6 ~3.97eV) and its electrical properties critically depend on its stoichiometry with respect to oxygen, on the nature and amount of impurities or dopants present and on its size as well as shape of nanostructures [9-11]. Stannic oxide is formed in the structure of rutile, the spatial group being P4/mnm. The unit cell is tetragonal, it consists of six atoms – two stannum and four oxygen atoms – and is characterized by the lattice parameters a and c and intrinsic parameter u. The optimized cell parameters obtained in the calculation are as follows: a=b= 4.738Å, c= 3.188Å and u = 0.30756. In the bulk all Sn atoms are six-fold coordinated to threefold coordinate oxygen atoms. The SnO₂ is an anisotropic polar crystal, which crystallizes in tetragonal rutile structure [12-16]

In this work, SnO₂ nanoparticles is synthesized by using co-precipitation method. The humidity sensing properties of the synthesized material such as hysteresis cycle, sensitivity and response time of pure synthesized material were studied.

2. Experimental

2.1 Synthesis of SnO₂ nanoparticle

All the chemicals used in this study were of GR grade purchase from Sd-fine, India (purity 99.99%). In preparation of SnO₂, 2 g (0.1 M) of stannous chloride dehydrate (SnCl₂.2H₂O) is dissolved in 100 ml distilled water. After complete dissolution, about 4 ml ammonia solution is added to above prepared aqueous solution with magnetic stirring. The solution was stirred for 20 minutes to make homogeneous solution. White gel precipitate is immediately formed and it is allowed to settle for 12 hrs. Then it is filtered and washed with deionised water 2-3 times. The obtain precipitate were mixed with 0.27 g carbon black powder (charcoal activated). The obtained mixer is kept in vacuum oven at 70 °C for 24 hours so that the mixer gets completely in to dried powder. Then this dry product was crushed into a find powder by grinder. Now obtained product of fine nano powder of SnO₂

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Humidity Sensing Properties of PANI Doped Zinc Oxide Nanocomposites Thick Film Sensor

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Abstract

Over the last decades a variety of chemical sensors have been developed based upon semiconductors, which monitor different characteristic sensor properties such as conductivities for electronic conductivity sensors. In the present work Polyaniline is prepared by polymerization of aniline under acidic condition. Zinc Oxide (ZnO) nanoparticle prepared by wet chemical method at room temperature using zinc nitrate and sodium hydroxide as starting material. ZnO nanoparticles were combined with conducting (PANI) polymer via polymerization in acidic aqueous solution to obtain a new type of inorganic – organic composites nanostructured. It is observed that PANI doped ZnO nanocomposites sensor shows a high response and sensitivity with good repeatability as compared to that of pure PANI and ZnO nanoparticle. The effect of hysteresis of the sensors, the effects of pure and composite oxide on sensitivity of the sensors were studied. The crystallinity and the crystallite size were examined by X-Ray Diffraction technique.

Keywords: Polyaniline, Zinc Oxide Nanocomposites, Humidity sensor.

1. Introduction

There is a growing demand for a sensing system that has high sensitivity, wide dynamic range, good stability, quick response, good reproducibility, simple structure and minimal cost. Metal oxide films sensitive to humidity have been reported earlier where sensing has been done using optical means. However, metal oxide humidity sensors depending upon measurements of electrical parameters require high temperature operation and consume significant amount of power. Humidity control and monitoring are of great interest to a wide area; these include moisture sensitive products, fresh and pack-age food, drug storage and environmental control for valuable Antiques or paintings etc. [1, 2]. Humidity sensors that are available in the market include dew point, infrared, catalytic and tin oxide-based sensors, which may be expensive, or require high temperature operation and consume significant amount of power and high cost of maintenance [3]. Much research has been focused on the development of humidity sensitive material [4–6]. Among these are the investigation of using conducting polymers such as polyaniline, polypyrrole, and polythiophene for humidity and gas sensing [7–9]. Advantages with polymers as sensing materials are light weight, flexible, low cost and simple fabrication process [10]. Pure polymer, polymer blends and polymer–inorganic composites have also been studied for the purposes, resulting in different degree of advancements in this area [11–16].

2. Synthesis of Material:

A) Synthesis of Polyaniline (PANI): In general is synthesized using two major polymerization approaches: electronic and chemical polymerization. In the present work polyaniline is synthesized by chemical polymerization method in which 0.2 M aniline hydrochloride is used as monomer unit. The synthesis is done by oxidative polymerization with 0.25 M ammonia peroxy sulphate in aqueous medium. Both solutions kept 1 hour at room temperature then mixed in beaker, briefly stirred. And left at rest to polymerized, next day, the PANI precipitate was collected on a filter, washed with three 100 ml portion of 0.2 M HCL and similarly with acetone. Polyaniline hydrochloride powder was dried in air and then in vacuum at 60°C. Polyaniline prepared under these reactions and processing condition are further referred to as standard sample.

B) Synthesis of Zinc oxide (ZnO): It is prepared by the aqueous solution of zinc nitrate. And is prepared by dissolving 0.2 M of zinc nitrate hexahydrate in 100 ml of distilled water. To this aqueous zinc nitrate solution 0.2 M sodium hydroxide is added and the reaction mixture was heated at 80°C along with stirring and the



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Ba TiO₃ doped Polyaniline based Nanocomposites thick film sensor for humidity sensing Application

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Abstract

Polyaniline (PANI) and BaTiO₃-Pani composites were synthesized by chemical polymerization method using ammonium per sulphate (APS) as an oxidizing agent. This is a single step polymerization process to synthesize the conducting polymer. Thick films of PANI and BaTiO₃-Pani were fabricated by Screen – Printing followed by firing at 70° c for 30 min. BaTiO₃-Pani thick films resulted in humidity sensor. An exceptional sensitivity was found to the relative sensor at 80° c and no cross sensitivity was observed to other hazardous and polluting gases ever at higher concentration. . The effect of microstructure and dopant concentrations on the gas response,Hysteresis , sensitivity, of the sensor in the presence of humidity were studied and discussed.

Keywords: Polyaniline , Barium Titanate,BaTiO₃-Pani composites , Humidity sensor.

1. Introduction

The use of sensors by human being has been day by day increasing at an astounding rate in the last few years and modern society depends heavily on the use of the sensors for variety of purposes. Over the last decades a variety of chemical sensors have been developed based upon semiconductors, which monitor different characteristic sensor properties such as conductivities for electronic conductivity sensors, impedance for capacitance sensors, potentials for field effect sensors or temperatures for calorimetric sensors. For the determination of gas components, many of these devices make use of the same molecular detection principle. Depending on the operation temperature, their signals are caused by changes in the concentration of free electrons, dielectric constants, electrical fields and heats of adsorption or reaction. These changes result from physisorption, chemisorption, catalytic reactions, and surface or bulk defect reaction with particles from the gas phase.

There is a continuing need for accurate, reliable, inexpensive sensing systems for measuring relative humidity (RH), not only for human comfort but also for a broad spectrum of applications in chemical industry, process control, atmospheric sciences, agriculture etc. Humidity is one of the most common constituents present in the environment and its measurement is indispensable when it comes to monitoring of various environmental parameters. For instance, detecting organic pollutants in indoor atmosphere, organic vapour monitoring, maintenance of Green houses, performance of air/ smoke filters, hydrocarbon sensing are all affected by relative humidity conditions. Therefore, sensing and controlling relative humidity is of great importance [1].

In the recent years there has been significant progress in the field of polymer based humidity sensors. According to their sensing mechanisms these can be either resistive type or capacitive type. In addition to the traditional quaternary ammonium and sulfonate compounds, polymers containing phosphonium have also been studied for humidity sensing. Copolymers, mutually reactive copolymers and conjugated polymers have also been reported for humidity sensing. Conjugated polymers especially conducting polymers like polypyrrole, polyethylene, polypropylene etc. have shown humidity sensing properties [2]. Besides these metal-polymer nanocomposites for instance iron oxide-polypyrrole have also been reported for relative humidity sensing sensor. The present study deals with the humidity sensing application such as relative humidity, stability humidity, selectivity etc. of selected inorganic materials.

Humidity control and monitoring are of great interest to a wide area; these include moisture sensitive products, fresh and pack-age food, drug storage and environmental control for valuable Antiques or paintings etc. [3,4]. Humidity sensors that are avail-able in the market include dew point, infrared, catalytic and tin oxide sensors, which may be expensive, or require high temperature operation and consume significant amount of power



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Humidity Sensing Properties of SnO₂ Doped with Polyaniline

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Abstract

The use of sensors by human being has been day by day increasing at an outstanding rate in the last few decades and modern society depends heavily on the use of the sensors for variety of purposes. Over the last eras a variety of chemical sensors have been developed based upon semiconductors, which monitor different characteristic sensor properties like conductivities for electronic conductivity sensors, impedance for capacitance sensors, potentials for field effect sensors or temperatures for calorimetric sensors. In this work we have synthesized nanocomposites of conducting polymer and metal oxides by chemical route method. In this work the material SnO₂ and polyaniline (PANI) were used with different weight percent and prepared pristine and mixed nanocomposites by suitable techniques and calculate change in the relative humidity. It is observed that PANI doped SnO₂ nanocomposites sensor shows a high response and sensitivity with good repeatability as compared to that of pure PANI and SnO₂ nanoparticle. The effect of hysteresis plot of sensors, sensitivity of the sensors were studied. The crystallinity and the crystallite size were examined by X-Ray Diffraction technique and surface morphology of synthesis is studied by Scanning electron microscopy (SEM),

Keywords: Polyaniline, SnO₂ nano composites, Humidity sensor, Screen printing technique

1. Introduction :

There is a growing demand for a sensing system that has high sensitivity, wide dynamic range, good stability, quick response, good reproducibility, simple structure and minimal cost. Metal oxide films sensitive to humidity have been reported earlier where sensing has been done using optical means. However, metal oxide humidity sensors depending upon measurements of electrical parameters require high temperature operation and consume significant amount of power. Humidity control and monitoring are of great interest to a wide area; these include moisture sensitive products, fresh and pack-age food, drug storage and environmental control for valuable Antiques or paintings etc. [1, 2]. Humidity sensors that are available in the market include dew point, infrared, catalytic and tin oxide-based sensors, which may be expensive, or require high temperature operation and consume significant amount of power and high cost of maintenance [3]. Much research has been focused on the development of humidity sensitive material [4-6]. Among these are the investigation of using conducting polymers such as polyaniline, polypyrrole, and polythiophene for humidity and gas sensing [7-9]. Generally, conducting polymers behave quite similarly on exposure to humidity. A resistance decrease (or conductivity increase) is observed due to the formation of H-bonding between water molecules and the nitrogen centre of the polymer backbone. This facilitates the proton exchanges to increase the doping level of the conducting polymer and so the number of charge carriers increases, resulting in an increase in conductivity [10].

2. Synthesis of Material:

A) Synthesis of Polyaniline (PANI): In general is synthesized using two major polymerization approaches: electronic and chemical polymerization. In the present work polyaniline is synthesized by chemical polymerization method in which 0.2 M aniline hydrochloride is used as monomer unit. The synthesis is done by oxidative polymerization with 0.25 M ammonia peroxy sulphate in aqueous medium. Both solutions kept 1 hour at room temperature then mixed in beaker, briefly stirred. And left at rest to polymerized, next day, the PANI precipitate was collected on a filter, washed with three 100 ml portion of 0.2 M HCL and similarly with acetone. polyaniline hydrochloride powder was dried in air and then in vacuum at 60°C. Polyaniline prepared under these reactions and processing condition are further referred to as standard sample.

B) Synthesis of Tin oxide (SnO₂): In preparation of SnO₂, 2 g (0.1 M) of stannous chloride dehydrate (SnCl₂·2H₂O) is dissolved in 100 ml water. After complete dissolution, about 4 ml ammonia solution is added to above aqueous solution with magnetic stirring. Stirring is continued for 20 minutes. White gel precipitate is immediately formed. It is allowed to settle for 12 hrs. Then it is filtered and washed with water 2-3 times by using deionized water. The obtained precipitate were mixed with 0.27 g carbon black powder (charcoal activated). The obtained mixer is kept in vacuum oven at 70 °C for 24 hours so that the mixer gets completely in to dried powder. Then this dry product was crushed into a fine powder by grinder. Now obtained product of fine

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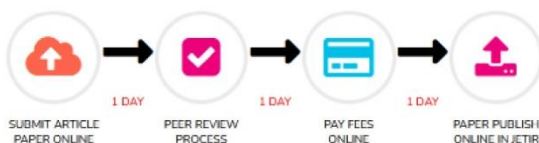
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**THERMODYNAMIC STUDIES ON MOLECULAR INTERACTIONS IN
AQUEOUS SOLUTIONS OF BARBITURIC ACID, 1,3-DIMETHYL
BARBITURIC ACID AND THIOBARBITURIC ACID**

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Abstract

The densities, ultrasonic velocities and refractive indices of barbituric acid, 1,3-dimethyl barbituric acid and thiobarbituric acid in aqueous solutions have been measured at 37 °C. The volumetric and acoustical properties were calculated from densities and ultrasonic velocities in order to understand the interactions between barbituric acid-water, 1,3-dimethyl barbituric acid-water and thiobarbituric acid-water. The quantum chemical calculations of barbituric acid, 1,3-dimethyl barbituric acid and thiobarbituric acid in gas phase and in water performed employing GAUSSIAN 09 programme. Energies, bond lengths, IR frequencies of selected interacting groups are reported for studying the solute-solvent interactions.

Keywords:- Thermodynamic properties, Molecular interaction, Compressibility, Barbiturate, DFT

I. INTRODUCTION

Drug-macromolecular interactions are an important phenomenon in physiological media such as blood, membranes, intra and extracellular fluids. The processes of drug transport, protein-binding and anaesthesia are few examples where drug and bio macromolecules appear to interact in an important and vitally significant manner. Thermodynamic properties are generally convenient parameters for interpreting solute-solvent and solute-solute interactions in the solution phase [1-6]. Fundamental properties such as enthalpy, entropy and Gibbs energy represent the macroscopic state of the system and interpretation of these macroscopic properties in terms of molecular phenomena is generally difficult. Sometimes, higher derivatives of these properties can be interpreted more effectively in terms of molecular interactions.

However, some drug effects are non-receptor mediated and are caused by the particular physical or chemical properties of the drug molecule. To firmly grasp the concepts of how desired and deleterious effects are induced in the body by a drug molecule requires an understanding of where and how these molecules interact.

The study of volumetric, acoustical and optical properties of biomolecules in aqueous and aqueous-cosolute solutions provide significant information regarding molecular interactions and hydration behaviour of these molecules. The organic salt like disodium tartarate can change the binding trends and hydration behaviour of biomolecules in solution. The changes in molecular environment and molecular interactions involved are reflected in thermodynamic properties. Interactions between drug and macromolecule are important in biophysical chemistry [7-8]. Drug-electrolyte or drug-active organic molecule interactions are significant for pharmacokinetics and pharmacodynamics. The thermodynamic properties and molecular interactions in aqueous solutions of drug in presence



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Antibacterial and Antifungal Activities of new unsymmetrical thiobarbituric acids and their Knoevenagel Products

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Abstract

The synthesized thiobarbituric acids and Knoevenagel products were evaluated for their antimicrobial activities against various pathogens *Bacillus cereus*, *Staphylococcus aureus*, *Escherichia coli* and *Candida albicans* using cup plate agar diffusion method.

Introduction

Microbes are unique creatures that adapt to varying lifestyles and environment resistance in extreme or adverse conditions. Continuous change in genetic architecture of microbes it becomes a challenge for the society to find new chemical entities which can treat microbial infections.¹ The alarming rates of the growing emergence of antimicrobial resistance are major concern to the public health and scientific communities worldwide, especially in the field of multi drug resistant bacteria and fungi.^{2,3} These trends have emphasized the urgent needs for new, more effective, less toxic and safe antimicrobial agents and the development of structurally new classes of antimicrobials with novel mechanisms of action as well as structural modifications to improve both their binding affinity and their spectrum of activity.⁴

Structural modification of antimicrobial drugs to which resistance are developed and has been proven to be an effective means of extending the lifespan of antifungal agents such as the azoles,⁵ antiviral agents such as the non-nucleoside reverse transcriptase inhibitors⁶ and various antibacterial agents including β -lactams and quinolones.⁷ It is not surprising in response to antimicrobial resistance, major pharmaceutical companies have tended to concentrate their efforts on improving antimicrobial agents in established classes.^{8,9,10}

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DIASPORA AND IDENTITY CRISIS IN THE NOVELS OF BHARATHI MUKHERJEE

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ABSTRACT

*This paper mainly focuses on the diaspora and Identity crisis is one of the key issues that are given space with ,especially in diasporic writings of Bharathi Mukherjee, who was born in india left her motherland and settled in America in that alien culture she faced many odd situations which she has aptly reflected in her writings .As the novelist herself was born in India she has a close bond with Indian culture she has a difficult time to adjust with foreign culture. In a wide range of her works be it **Jasmin** , or **Tiger's Daughter**, or wife **Leave it to me** ,**Holder of the world,Tree Bride** and **desirable Daughters** all her women characters are depicted facing many adverse situations in their respective lives.They all are victims of immigration .Moreover all her women are the ones around whom entire action of the story revovls.she has very skillfully dealt with feminism. True that her characters suffered at many levels yet they emerge out of those situation to be a new woman who survives in a male-dominated society because of discrimination inequality,patriarchy.More importantly her women characters are life –like they undergo various situations that they have never faced in their lives we meet Tara Banerjee in The novel Tiger's Daughter,In another novel Desirable Daughters we meet . three sisters Padma, Parvati and Tara ,we are introduced to Jyoti in Jasmine which is her amous novel and we meet Dimple in Wife. Bharati Mukherjee who suffered all the adverse problems created by male dominated society and highlighted the very picture of Indian society at large. Her female characters belong to the middle class and lower class of the society. The main concern of the characters is clash between modernity and old customes of society . Mukherjee as a migrant writer faces a large number of problems and difficult situations*

Keywords: Diasporic, ,Immigration Feminism,Inequality

Introduction

Bharathi Mukherjee is a big name in literature,as a novelist ,as a unique women novelist of Indian diaspora.She is known as immigrant novelist of America.She was born in a Bengali family in Culcutta.She belonged to a rich,well –cultured Brahmin family. She completed her graduation in India then started working as a professor emerita in the department of English university of California Barkley She has about eight novels and a few short stories to her credit.

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The Highly Efficient Inorganic SrF₂:Gd³⁺, Eu³⁺ Phosphor for Mercury-Free Fluorescence Lamps

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Keywords: Visible Quantum Cutting, Down-conversion, Vacuum Ultraviolet (VUV) spectroscopy, Mercury Free fluorescent lighting (MFFL), Quantum Efficiency.

Abstract. The strong vacuum ultraviolet (VUV) radiation absorption and energy transfer mechanism are detected in SrF₂: Gd³⁺, Eu³⁺ fluoride phosphor. The phosphor is synthesized by a wet chemical method followed by a reactive atmospheric process (RAP). The Powder XRD analysis shows structural purity. The photoluminescence characteristics of SrF₂:Gd³⁺, Eu³⁺ phosphor is studied using the remote access of 4B8 window (VUV beamline) of the Beijing Synchrotron Radiation Facility (BSRF) China. In this paper, the energy transfer mechanism from the Gd³⁺ to Eu³⁺ through the cross-relaxation process is investigated. The down-conversion of energy from VUV (142 nm) to visible with a quantum efficiency (QE) of around 124% has been detected. The PL excitation and emission characteristics of the prepared phosphor advocate it as a prominent material for applications in mercury-free fluorescent lighting (MFFL) & Plasma Display panels.

Introduction

In recent times, for the development of MFFL and plasma display panel (PDP) technology, new quantum cutting (two-photon luminescent) phosphors are becoming essential for the realization of highly resourceful luminescent materials under VUV excitation. The emission of two or more low energy photons for each high energy absorbed photon is termed quantum cutting mechanism. It is also known as a down-conversion (DC) mechanism with quantum efficiency greater than 100% and it deals with the vision of providing improved energy efficiency in lighting devices [1]. The VUV levels of many of the lanthanide ions have been recently measured, thereby providing the starting point from which new phosphors may be designed [2]. Shi. et al. reported that the visible quantum cutting via downconversion has been observed in BaF₂: Gd, Eu phosphor. The inorganic barium fluoride (BaF₂) host matrix has a wide energy band gap, having an energy gap of about 10.9 eV [3]. So that BaF₂:RE³⁺ (Ce, Pr, Tb, Eu, Dy) have been premeditated in some earlier reports [4-6]. On the same ground, in the present experiment Gadolinium (Gd) and Europium (Eu) are used as dopants in the SrF₂ host and excitation at the VUV range is anticipated.

The process of quantum cutting through downconversion in SrF₂ can occur by the combination of Gd³⁺ and Eu³⁺, in which Gd³⁺ acts as a sensitizer and Eu³⁺ acts as an activator. The current report presents the results of down-conversion luminescence for SrF₂: Gd³⁺, Eu³⁺ synthesised by the soft chemical route and the subsequent heating in the reactive atmosphere. The resulting fine powder was tested for the purity of phase by the XRD technique. The VUV excitation and emission properties are investigated through remote access of the 4B8 VUV spectroscopy beamline of BSRF, Institute of High Energy Physics in Beijing, China.



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Synthesis and Photoluminescence properties of Eu³⁺ ions doped LiBaPO₄ phosphor

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Abstract

The red orange emitting LiBa_(1-x)PO₄:xEu³⁺ phosphor was successfully synthesized by combustion method. The structure of the prepared LiBaPO₄: Eu³⁺ phosphor was confirmed by powder XRD analysis and its photoluminescence properties has been studied in the range of 200 – 400 nm. The XRD pattern of prepared LiBa_{0.98}PO₄:0.02Eu³⁺ phosphor is well matched with available standard ICDD file. The effect of different concentrations of Eu³⁺ ions in LiBaPO₄ phosphor was studied and optimum PL intensity was obtained at 0.01 mol of Eu³⁺ ion. The photoluminescence (PL) emission spectra of prepared LiBaPO₄:Eu³⁺ phosphor consist of series of sharp line peaks at 596 nm, and 615 nm under the excitation of 393 nm.

Keywords: Photoluminescence, Combustion method, LiBaPO₄:Eu³⁺, SSL

1.0 Introduction

The phosphates with chemical composition ABPO₄ (A and B are mono and divalent cations, respectively) are in a large family of monophosphates with the different structures rigorously depending on the relative ionic size of the A and B ions [1, 2]. These compounds have been considered to be efficient luminescent materials due to their excellent thermal and hydrolytic stability [3, 4]. Recently, Eu²⁺-doped ABPO₄ phosphates have received much attention because of its potential applications as new white light emission diodes (W-LEDs) phosphors, such as KCaPO₄:Eu²⁺ [5], KSrPO₄:Eu²⁺, [6] NaCaPO₄:Eu²⁺, [7] and ABaPO₄:Eu²⁺ (A = Na, K) [8]. The use of combustion synthesis has been developed looking at experiences of last few years in the preparation of luminescent materials, specifically borates, silicates, aluminates, and some oxides. The advantages of using the combustion method are low cost, highly effective as well as time saving approach to produce highly stable particles. Furthermore, under some specific conditions, uniform and narrow distribution of particle with regular size crystallite could be obtained by the combustion method [9]. Inspiring from the above discussion, it was decided to attempt the combustion method for the synthesis of LiBaPO₄ activated with Eu³⁺ as activator.

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VUV Photoluminescence properties of quantum harvester GdPO₄: Tb³⁺

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Abstract

The luminescence phosphor GdPO₄:Tb³⁺ with a single-phase monoclinic crystal structure has been successfully synthesized via the co-precipitation method by varying molar concentration of Tb³⁺ ions. Gadolinium phosphate singly doped terbium compound was first time reported with the co-precipitation method. This paper explores the photoluminescence properties of Gd_(1-x)PO₄: x%Tb³⁺ under VUV excitation. The energy transfer process between host matrix (GdPO₄) and dopant (Tb³⁺) was investigated successfully. The extreme quantum efficiencies were found to be 168 and 163 %, under the VUV excitation of 205 and 155 nm respectively. The emission of green color ($\lambda = 543$ nm) was observed under the excitation of 147 and 172 nm. Therefore, this compound may be a potential candidate for mercury-free fluorescent lighting (MFFL) application.

Keywords: Quantum Cutting (QC), Vacuum Ultraviolet (VUV), Quantum Efficiency (QE), Mercury Free Fluorescent Lamps (MFFL).

1. INTRODUCTION

In the lamp phosphors industries, research has been enthused due to the need for new luminescent material suitable for mercury (Hg) free fluorescent lamps (MFFL). In Hg free fluorescent lamp, phosphor powder is excited by VUV photons (140-190 nm), which are usually generated from the Xe resonance emission line (147 nm) or by the Xe₂ molecular emission band (172 nm) and get a visible photon. The greater energy of the VUV photons intrinsically confines the energy efficiency of a phosphor if only one visible photon is generated per VUV photon in the discharge. If compare between Hg discharge & Xe discharge, it has been observed that more energy losses in Xe discharge. Therefore, new phosphors with quantum efficiency greater than 100% are mandatory for this purpose. The host materials must possess a large bandgap so that materials are capable to absorb high-energy photons ($\lambda < 200$ nm). It is one of the necessary conditions for attaining QE of more than 100 % by QC [1, 2].

QC is a process that happens in materials that emit two or more photons per photon absorbed [3]. Theoretically, it is possible because a VUV photon has two times larger the energy of a visible photon. The quantum cutting phenomenon can be understood via photon cascade emission and cross-relaxation energy transfer (CRET); the process involved in CRET is also known as down-conversion [4-6].

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