



The Berar General Education Society's

# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

(Re-accredited with 'A' Grade by NAAC with CGPA 3.12)



World Creativity and Innovation  
Day 2023

*On this Innovation day,  
I wish you Develop your own Vision. Vision is the Specialty of  
Seeing the Imperceptible*





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# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

(Re-accredited with 'A' Grade by NAAC with CGPA 3.12)



World Creativity and Innovation Day  
2023

*Edited by*

*Dr. Poonam T. Agrawal*  
*Assistant Professor & Head*

*Shri R. L. T. College of Science Akola*

*Dr. Kavita M. Heda*  
*Assistant Professor*

*Shri R. L. T. College of Science Akola*

*Dr. Ashish G. Sarap*  
*Assistant Professor*

*Shri R. L. T. College of Science Akola*



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# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

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Dr. V. D. Nanoty  
Principal  
Shri R. L. T. College of  
Science Akola

I am Extremely pleased to present the Third issue of the creativity and Innovation Magazine going to be publish by Shri R. L. T. College of Science, Akola. exclusively meant for churning out the talent which bears immense potentiality of sharpening your innovative idea I congratulate all the contributors and the editorial board for bringing out such a beautiful magazine.

It will help the reader and contributor to update their knowledge and will give good exposure to recent development of innovative idea in science and technology. I am confident that this magazine will prove excellent platform to student who are interest in various competition like avishkar and all



Dr. P. T. Agrawal  
Head  
Department of Chemistry  
Shri R. L. T. College of  
Science Akola

This is the first issue of the creativity and Innovation Magazine going to be publish by Shri R. L. T. College of Science, Akola.

The aim of the magazine is to provide the platform for the students to publish creativity and Innovation Present in their mind.

As we believe that creativity and Innovations has no limitations of any subject, any languages, creative ideas and Innovations in all disciplines are welcome for the publication in this magazine. We are sure that our magazine will provide creative ideas and Innovations of new generations that will continue to help everyone interested in Research Field. We again hope that the magazine gives rise to Novel Research and many patents come forward through this playform. The help provided by our students is appreciable.

We would like to thank Management, Principal, Teaching and Non teaching staff members for their support towards this magazine. Dr. V. D. Nanoty, Principal, Shri R. L. T. College of Science Akola



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Adv. Motisingh Mohta  
Hon'ble. Prsident  
The Berar General Education  
Society's Akola

I am happy to know that 'Crystal Club' Department of Chemistry of our Shri R.L.T. College of Science, Akola is publishing its Innovation Magazine-2022.

Magazine has a great educative value. Publication of such a magazine motivate the students to think and do some creative things. It provides a big platform for the innovative thinking and inspire them to do some innovative research work. In fact, young talent finds it first exposure through this medium. Publication of such magazine also records the hidden talent among the students and help society to find out the budding scientists. I hope that this publication would be successful in achieving this objective. I congratulate and give my best wishes to the entire team.



Mr. Pavan N. Maheshwari  
Hon. .Secretary  
The Berar General Education  
Society's Akola

I am indeed happy to learn that the Department of Chemistry of our Shri R. L. T. College of Science, Akola is publishing Innovative Magazine on occasion of International Innovation and Creativity Day. Such a magazine provides an opportunity to the students to showcase their talent and explore their creative potential. I appreciate the new concept undertaken by the faculty member of chemistry department. I am sure that the matter incorporated in the magazine will brings out some beneficial output for the society. I extend my best wishes for successful publication of this magazine.



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Ms. Arti. G. Kadu

M. Sc. -II (Sem –  
IV) Chemistry

Contact

Department of  
Chemistry

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

E.Mail. :-



The Berar General Education Society's

# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

(Re-accredited with 'A' Grade by NAAC with CGPA 3.12)

## Homemade Organic NPK Plant Fertilizer

### ❖ INTRODUCTION :-

Today use of organic or natural fertiliser for plants has greatly increased. They are prepared from waste of plant, animals therefore they are called natural fertiliser. They are environment friendly after getting mixed in soil they breakdown slowly hence microorganisms grows in soil and texture of soil improved ability of soil to hold nutrient, moisture also improved. And plant gets supply of nutrients for long time so it make both soil and plant healthy.

Note :- ( Organic matter which we are using as fertilizer should be pre – composted otherwise it may give negative results.)

### ❖ Requirements :- For 5 litre liquid fertilizer we require :-

- ❖ 1 ) 200 gm mustard cake ( 4-5% Nitrogen, 1- 2 % Phosphorus , 1 – 1.5 % Potassium) or it may be Substituted with other locally available deoiled cakes like groundnut cake, castor cake sesame , cotton seed cake.

2 ) 200 gm Neem Cake Powder :- It has antibacterial and antifungal properties, NPK value is approximately equal to mustard oil cake .

3) 250 gm orange skin – It contains high amount of potassium, micronutrients and d – limonin ( Pest repellent).

4) 150 gm Bone Meal :- It is best source of calcium and potassium in form easily absorbed by plants

5) 50 gm crushed garlic :- It contains alicin and other sulfur compounds having antibacterial and antiviral properties.

6 ) 250 gm banana peels :- It contains high amount of potassium little amount of phosphorus and magnesium and other trace elements like Fe, Zn etc.

7) 250 ml buttermilk :- It contains K, Ca, P and other trace elements, minerals and lactobacillus bacteria which help in pre composting of organic matter.

8) 150 gm Jaggery / Molasses :- It has K, other trace elements, due to it growth of bacteria responsible for decomposition of organic matter takes place .

### ❖ Procedure :- 1) Take 5 litre unchlorinated, clean potted water in a bucket, to this add jaggery, molasses and mix thoroughly with stick to form solution.

2) To this solution one by one add all other components ( mustard cake, neem powder, banana peel, orange peel, bone meal, , garlic, buttermilk) .

3) Stirr it properly with help of stick and cover the bucket with help of newspaper and keep it in warm, shady place as it as for 7 – 10 days and stirr sometimes in between ( within 7 – 10 days bacteria grows in solution and make process of pre – composting fast).

4) After 10 days filter the solution in bucket keep the residue ( Solid waste) in compost bin.

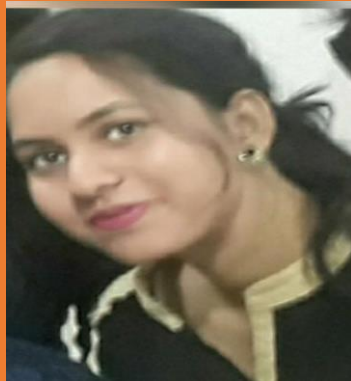
5) Transfer the solution ( Filtrate) in air tight bottle)/ container ( Keep some place in bottle empty, do not fill complete bottle) Keep it in shady place.

6 ) This Fertilizer is now ready to use but not fully decomposed it can take several months . ( Store it in shady place and on alternate days slightly loose the lid of bottle so that gases produced due to decomposition evolved once the decomposition is complete gases evolution stops)

### ❖ Usage Of liquid organic NPK fertilizer :- 1) Mix 30 – 60 ml of fertilizer liquid with 1 litre of water, after dilution is completed you can add it to soil of plants just the way you water the plants. 2) For potted plants amount of liquid should be such that it reaches every part of soil. 3) Concerning height of plant, pot size, other requirements of plant it can be used at interval of 1- 3 week. 4 ) This fertilizer ensures proper uptake of minerals and nutrients by plants and make both plant and soil healthy.

### ❖ Advantages :- 1 ) Cost effective 2) Environment friendly 3) It Can be used for all type of plants in any season . 4) It never spoil you can store it as long as you want.

### ❖ Drawback :- Like chemical fertilizers organic fertilizer are not ready to eat food. After getting mixed in soil organic matter break down slowly with help of microorganisms and then nutrients are released. So, it is not necessary that just after using this fertilizer plant health is improved, it takes some time.



Ms. Aditi . P.  
Chaukhande

M.Sc.-II Year (Sem-  
IV)

Chemistry

Contact

Department of  
Chemistry

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

E.Mail. :-



The Berar General Education Society's

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## ❖ How To Make Bioplastic From starch At Home

**Introduction** : - Bioplastics Are a type of plastic that can be made from natural resources such as vegetable oils and starches. Bioplastic are easy to Recycle .It reduce to carbon dioxide level .bioplastic are plant based products , the consumption of petroleum for the production of plastic is expected to Decrease by 15 – 20 %.

### **Ingredients** : -

1. Water – 4 Tbsp
2. Vinegar – 1 Tsp
3. Glycerin – 1 Tsp
4. Corn Starch – 1 Tbsp

### **Procedure** : -

1. Firstly Take a Saucepan and place on the stove.
2. Then add this water , vinegar , Glycerin , Corn starch .
3. While the heat is off . Stir it well.
4. Then Turn the flame on and set the heat to medium – low .and keep stirring.
5. After a while , it will solidify into a mixture like Toothpaste.
6. keep Stirring the mixture until the become transparent with some bubbles.
7. Then take the mixture and off the heat .
8. And spread it as thin or thick , on paper to let it cool.
9. Then check the plastic after 2 days to see if it has fully hardened.
10. If we would like to mold the plastic into a shape , it must be done while it is still warm .

**Use** : - .They are widely used for packaging applications.





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## ❖ DNA EXTRACTION AT HOME

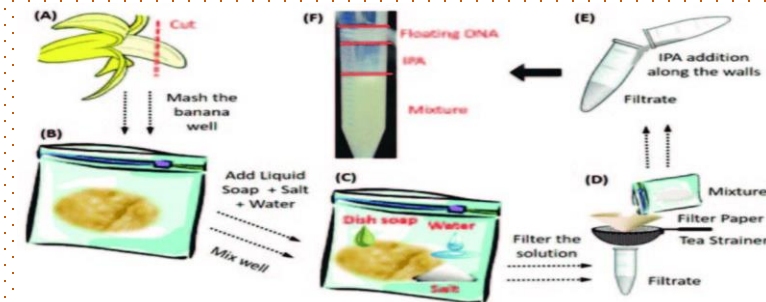
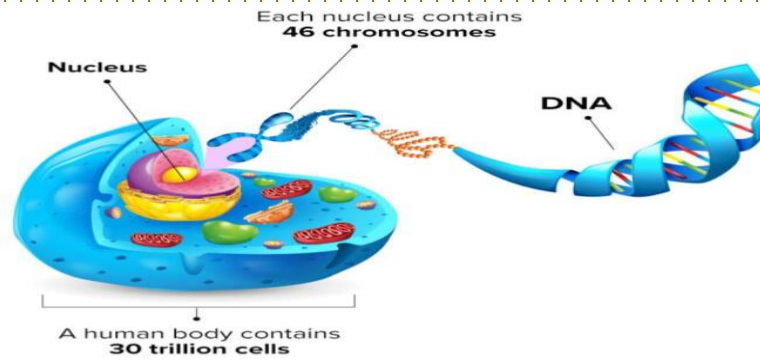
- **INTRODUCTION** :- DNA is known as **Deoxyribonucleic Acid**. It is an organic compound that has a unique molecular structure. It is found in all [prokaryotic cells and eukaryotic cells](#). DNA was first recognized and identified by the Swiss biologist **Johannes Friedrich Miescher** in 1869 during his research on white blood cells.

The double helix structure of a DNA molecule was later discovered through the experimental data by **James Watson** and **Francis Crick**. Finally, it was proved that DNA is responsible for **storing genetic information** in living organisms.

- **MATERIALS REQUIRED** :- 1 Banana, water, salt, liquid dishwasher soap, transparent glass, ziplock bag, sieve, rubbing alcohol.

- **PROCEDURE** :-

1. Take banana in container and water & give it a good mix . Keep it aside.
2. Take 1 tablespoon Table salt and water & half teaspoon dish washing soap in another container. Stir it well.
3. Add this solution to banana soaked in water.
4. Take a ziplock bag pour the solution with banana in it .
5. Smash the banana. The banana will turn pulpy.
6. Take a sieve and strain out the pulpy banana solution into a clear glass.
7. Now add about 5ml of your cold rubbing alcohol into the solution and gently mix.
8. Wait for a few minutes for the solution to settle, and voila! You should see the DNA neatly forming in the alcohol layer.



Ms. Ambika Mirjamle

M.Sc.-II Year (Sem-IV)

Chemistry

Contact

Department of  
Chemistry

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

E.Mail. :-





Mr. Amol Shriram  
Paraskar

M.Sc.-II Year (Sem-  
IV)

Chemistry

Contact

Department of  
Chemistry

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

E.Mail. :-



The Berar General Education Society's

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## ❖ MAKE YOUR OWN HERBAL COUGH SYRUP

### INGREDIENTS

- 20g of dried thyme
- 10g elecampane root
- 5g fresh ginger root chopped
- 10g dried elderberries
- 10g dried rosehips
- 1 cinnamon stick
- 500ml water
- about 500g sugar (or 500ml honey)

### METHOD

Place the elecampane, ginger root, elderberries, cinnamon stick and rosehips into a saucepan and cover with water and bring to the boil and simmer for 20 minutes to make a decoction.

Turn off the heat and add the thyme to the pan and infuse for a further 20 minutes.

Pour the decoction through a sieve to remove the herbs. Placing a piece of muslin cloth or cheesecloth inside the sieve can help to catch smaller bits.

Pour into a measuring jug.

Add the same amount of sugar or honey as there is liquid eg. if you have 400ml of decoction, add 400 g of sugar or 400ml honey.

Heat the mixture gently and stir until all the sugar has dissolved.

Allow to cool and then pour into sterilised glass bottles or jars. Store in the fridge and use within 3 months.

Dose: Take 1 tablespoon a day with hot water as a tonic or six times a day when you have a sore throat, cold or cough.





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## ❖ Determination of Caffeine in Tea samples

### INTRODUCTION

Tea is the most commonly and widely used soft beverage in the household. It acts as a stimulant for central nervous system and skeleton muscles. That is why tea removes fatigue, tiredness and headache. It is also used for lowering body temperature. The principle constituent of tea which is responsible for all these properties, is the alkaloid- caffeine in tea leavers varies from sample to sample pure caffeine has found to be tasteless substance.

It has a high tannin content may be as a high as 50 mg per cup. After all our main stress is an presence of caffeine in xanthene beverage and so in this magazine we will study and observe the quantity of caffeine varying in different samples of tea leaves.

### PROCEDURE:-

- 1) First of all, 50 grams of tea leaves were taken as sample and 150 ml of water was added to it in a beaker.
- 2) Then the beaker was heated up to extreme boiling.
- 3) The solution was filtered and lead acetate was added to the filtrate, leading to the formation of a curdy brown coloured precipitate.
- 4) We kept on adding lead acetate till no more precipitate has been formed.
- 5) Again solution was filtered.
- 6) Now the filtrate so obtained was heated until it had become 50 ml. 7) Then the solution left was allowed to cool.
- 8) After that, 20 ml. of chloroform was added to it.
- 9) Soon after, two layers appeared in the separating funnel.
- 10) We separated the lower layer.
- 11) The solution then exposed to atmosphere in order to allow chloroform to get evaporated.
- 12) The residue left behind was caffeine.
- 13) Then we weighed it and recorded the observations. Similar procedure was performed with different samples of tealeaves and quantity of caffeine was observed in them



### RED LABELLED TEA (Brook Band)

Weight of china dish	46.60gms
Weight of china dish with precipitated	47.20gms
Amount of caffeine	0.60gms

Ku Dipika Bhalchandra  
Joshi

M.Sc.-II Year (Sem-  
IV)

Chemistry

Contact

Department of  
Chemistry

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

E.Mail. :-



Ms. Divyani  
nandkishor harne

M.Sc.-II Year (Sem-  
IV)

Chemistry

Contact

Department of  
Chemistry

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

E.Mail.



The Berar General Education Society's

# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

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## ❖ Castile Soap Face Wash

### METHOD:

- (1) Pour some liquid Castile soap into a clean container. You will need a  $\frac{1}{4}$  cup (56.25 milliliters) of liquid Castile soap. Make sure that it is uncolored and unscented. Any dyes or scents may irritate your skin.
- (2) Consider adding chamomile tea to your face wash. Chamomile tea has anti-inflammatory properties and can help reduce redness.[1] If you wish to use chamomile tea in your face wash, brew a cup of chamomile tea and measure out a  $\frac{1}{4}$  cup (56.25 milliliters). Let the tea cool before adding it to the container.
- (3) Consider adding some honey to your face wash. For a more moisturizing cleanser, use raw honey instead. You will need a  $\frac{1}{4}$  cup (56.25 milliliters). Make sure that it is the runny, translucent sort.
- (4) Add the oil. You will need a  $\frac{3}{4}$  teaspoon of natural oil. Here are the types of oil you can use: avocado, coconut, grapeseed, hazelnut, jojoba, olive oil, sunflower oil, or sweet almond.
- (5) Consider adding some essential oil. Essential oils can not only make your face wash smell nice, but some oils can be beneficial to certain skin types.
- (6) Consider adding some vitamin E oil. You will only need a few drops. It will help moisturize and nourish your skin.
- (7) Close the container tightly and shake it. Do this for a few minutes until everything is combined.





Ms. Bhuvaneshwari  
Rajabhau Deshmukh

M.Sc.-II Year (Sem-  
IV)

Chemistry

Contact

Department of  
Chemistry

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

E.Mail.



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# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

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## ❖ Lava Lamp

### A. Introduction :

Sometimes we try something that makes us silently stare in wonder. Other times we come up with brilliant ideas that result in some pretty amazing things. This week both things happened when we made DIY Lava Lamps!

### A. Ingredients :

Jars or Bottles, Water, Tonic Water, Citric acid, Vinegar,  
Oil (vegetable or baby oil, I prefer baby oil because it is clear)  
Alka Seltzer tablet (or Eno or similar), Liquid Food Colouring  
Photoluminescent pigment  
Baking Soda (Sodium Bicarbonate)

### A. Process :

- 1) Fill the bottom of the jar with water to about  $\frac{1}{4}$  full.
- 2) Next add vegetable oil. Fill the bottle leaving about an inch at the top. In a mason jar I fill to the lip.
- 3) Add a few drops of food colouring. This is a fascinating step watching as the drops of food coloring fall through the oil and rest on top of the water before slowly starting to mix with the water at the bottom of the container.
- 4) Now it's time for the magic! Add a teaspoon of Alka Seltzer (if yours are in tablet form, break the tablets into quarters and add a quarter tablet to start).
- 5) Watch the lava lamp come to life with bubbles!
- 6) After a few minutes the reaction will settle down. To start it again, simply add more Alka Seltzer.
- 7) If you want to store the container and use it at a later time simply set it somewhere safe. If you need to put a lid on the container, make sure the reaction has completely stopped as a gas is released and a build up of pressure from the reaction could cause the container to rupture if you place a lid on it.

### A. Advantages :

There's nothing in the world like the iconic LAVA lamp when it comes to lighting up a room.





Ms. Prajкта Santosh  
Varma

M.Sc.-II Year (Sem-  
IV)

Chemistry

Contact

Department of  
Chemistry

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

E.Mail.



The Berar General Education Society's

# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

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## ❖ Homemade Water Dispenser

### • Ingredients:

3 cardboard of 15\*13cm and 10\*6cm each, cover cardboard, waste plastic bottle, origami paper, hot melting glue, straw, sharp , knife, metal scale etc.

### Process:

1. First of all make a cube shape using 15\*13cm cardboard and 10\*6cm cardboard.
2. Stick this base on a one of the cardboard having one side curve.
3. Glue the cover cardboard along with base cardboard the aim behind this is lifting the bottle.
4. Now, make a small on the front side of cover cardboard though which a straw can easily pass.
5. Make a hole as size of plastic bottle base on top cardboard for this you can take guide of comapss.
6. A small hole is done on plastic bottle as a size of straw.
7. With the help of hot melting glue we have glued straw on plastic bottle hole this straw is pass on cover cardboard wheel.
8. Top cardboard is now glued following the back part of cover cardboard.
9. Finally our water dispenser is ready to use.

### Advantages:

- There will be no wastage of water as it do not leaks or flow when lid is close.
- It is easy to add filter in the water dispensar.
- Water dispensary can great to store water .





Ms. Rajshri Gajanan  
Raut

M.Sc.-II Year (Sem-  
IV)

Chemistry

Contact

Department of  
Chemistry

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

E.Mail.



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# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

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## ❖ Bath Salts (Scented and Colored)

### Requirements :-

- 3 cups plain Epsom salt.
- 1.5 cups coarse sea salt (such a pink Himalayan sea salt)
- ½ cup baking soda.
- 20 drops essential oils of your choice (I like 10 drops lavender and 10 drops sweet orange)
- Optional: 2-3 tablespoons dried flowers if they are easy to get.

### How to prepare Bath Salts :-

- Mix 3 cups of Epsom salt with about 1.5 cups of coarse sea salt .
- And mix ½ cup of baking soda
- Then add 15-20 drops of essential oils and mix.
- Add in rose petals and combine gently.
- Separate into glass jars.

### Direction of use:-

- Add your bath salts to a warm tub of water anytime you want a little more relaxation or calming smell.
- Epsom salt is great for reducing inflammation, and rose oil is great for evening out your skin tone and reducing redness.





Ms. Aditi Sadanand  
Raut

M.Sc.-I Year (Sem-II)  
Chemistry

Contact

Department of  
Chemistry

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

E.Mail. :-  
shehagadge16@gmail.c  
om



The Berar General Education Society's

# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

(Re-accredited with 'A' Grade by NAAC with CGPA 3.12)

## ❖ Cracked Heel Cream

### Requirements:

1. Pure coconut oil : 15gm
2. Paraffin wax : 4gm( candle wax)

(It's a by product of petroleum. Used in many foot treatment but not recommended to use in facial or body cream)

3. Camphor : 1-2 gm

### Procedure:

1. Take a 15gm of coconut oil in a bowl
2. Add 4 gm of paraffin wax in it.
3. Add (1-2 gm) pinch of camphor in a bowl
4. Mix it well in a water bath till it melts and mixes thoroughly.
5. Pour it in a container, you want to store it and let it dry

### How to apply:

1. Wash feet with warm salted water
2. Let your feet dry
3. Apply it overnight

### Benefit:

Make your feet baby soft and smooth with this highly effective home remedy. We get result in 3 to 5 days. This cream will help you heal deep cracks in your heel and make them soft and supple.

### BEFORE AND AFTER USE





Ms. Alka Tiwari

M.Sc.-I Year (Sem-II)  
Chemistry

Contact

Department of  
Chemistry

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

E.Mail.



The Berar General Education Society's

# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

(Re-accredited with 'A' Grade by NAAC with CGPA 3.12)

## ❖ ALOVERA HERBAL SOAP

**Introduction :-** Aloe vera herbal soap is a natural soap made with aloe vera plant extract and other natural ingredients. It is known for its moisturizing, soothing, and healing properties, and is suitable for all skin types. Aloe vera herbal soap is gentle on the skin and free from harsh chemicals and synthetic fragrances, making it a safe and healthy option for your skin. It can help to soothe and heal dry, irritated, or inflamed skin, and may also help to reduce the appearance of fine lines and wrinkles. Regular use of aloe vera herbal soap can leave your skin feeling soft, smooth, and refreshed.

Here is a procedure on how to make aloe vera herbal soap

1. Cut fresh aloe vera leaves and extract the gel using spoon. Be sure to remove the yellow part of the leaf as it can cause irritation.
2. Melt soap base over low heat in a double boiler or microwave. Use a natural and unscented soap base to maintain the natural benefits of aloe vera.
3. Add aloe vera gel to the melted soap base and stir well until it is completely mixed .
4. Add the natural ingredients such as essential oils, herbs, or flowers to enhance the fragrance and benefits of the soap.
5. Pour the mixture into the soap molds and let it cool for a few hours or overnight until it hardens.
6. Once the soap is fully hardened, remove it from the molds and store it in an airtight container. Your aloe vera herbal soap is now ready to use.







Ms. Dipali Suresh  
Karale

M.Sc.-I Year (Sem-II)  
Chemistry

Contact

Department of  
Chemistry

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

E.Mail. :



The Berar General Education Society's

# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

(Re-accredited with 'A' Grade by NAAC with CGPA 3.12)

## ❖ PREVENTION MEASURES TO CONTROL LUMPY AND REMEDY FOR WOUNDS

**Abstract-** ' PREVENTION IS BETTER THAN

CURE'. It is a viral disease of cattle. The disease has a dramatic effect on rural livelihood. So in this project we have tried and studied the some possible ways for the prevention and remedy for wounds cause by lumpy skin disease. In the view of this we make mosquito repellent spray and added methylene blue in this spray for cure the wounds and made organic upali to reduce the vector in that area.

**Introduction-** Lumpy skin disease is a vector-borne disease. It is caused by virus called CAPRIPOX virus of family POXIVIRADAE. It is genetically related to the goatpox and sheeppox virus. It is transmitted by blood feeding insects such as certain flies and mosquitoes or ticks

**Impact** - Lumpy skin disease causes huge economic losses to the livestock farmers due to significant milk loss, damage of the hides and reproduction problems such as abortion and infertility in affected animals.

Preparation of organic upali

- 1) Citronella Grass
- 2) Lemon Grass
- 3) Lavender Grass

**Methodology-**Preparation of herbal mosquito repellent spray.

Aroma oil - 3mlb , Citronella oil - 3ml

Lemon grass oil-3ml, Eucalyptus oil-3ml Peppermint oil - 1ml

Emulsifier - 3ml ,

Mix with blender all this thoroughly for near about 1 hr. Citronella hydrosol - 37ml Distilled water - 50ml

Keep this overnight Add methylene blue

**Conclusion-** The newly made mosquito

repellent spray containing methylene blue was found to be effective to reduce the vector in that area and methylene blue shows more promising to cure the wounds cause due to lumpy skin disease. The fragrance of organic upali helps to maintain auspicious atmosphere for cattle and the vector are goes away because that fragrance. All this spray or upali are herbal and cost effective solution against lumpy skin





Ms. Savari Vinayak  
Mirge

M.Sc.-I Year (Sem-II)  
Chemistry

Contact

Department of  
Chemistry

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

E.Mail. :



The Berar General Education Society's

# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

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## ❖ Homemade natural shampoo Onion And Rose Shampoo

Onion is one of the best ingredients for your hair. It strengthens hair roots, improves blood circulation, hydrates the scalp, and eventually makes your hair healthy. However, using onion directly on your hair can leave that pungent smell on your tresses.

### Procedure -

- Peel onion and grate to squeeze out the juice.
- Pour the juice into a bowl and add rose water. Mix well.
- Wet your hair and then apply this mixture with a spray bottle or as is all over your hair.
- Keep for about 30 minutes.

Wash with normal water.





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# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

(Re-accredited with 'A' Grade by NAAC with CGPA 3.12)



Ms. Tejal  
Dharmendrasingh  
Thakur

M.Sc.-I Year (Sem-II)  
Chemistry

Contact

Department of  
Chemistry

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

E.Mail. :

## ❖ Formulation of biologically made silver nanoparticles based Herbal Scrub.

### Introduction -

Nowadays people gave first preference to herbal products for their skin.

Numbers of skin product are available in market to remove tanning, acne, pigmentation and sun burn, etc.

I am just try to make stupendous herbal scrub with is blended with silver nanoparticles.

Skin decrease is one of the major problems which affects the people worldwid.

Rise in temperature and increase in pollution may be the main cause of skin disease.

**Key words** - skin tanning, sun burn, skin pigmentation and skin rashes.

### Methodology

### Preparation of herbal scrub -

2 tbs of gram flour, 1 tbs of curd , pinch of turmeric powder, 1 capsule of vitamin E, 1 tbs of aloevera gel, few drops oalmond and coconut oil, 4-5 drops of lemon juice. Preparation of silver nanoparticles from *Withania somnifera*

### Result -

1. Main purpose of herbal scrub is to Remove the tanning.
2. Tanning remove in 6-7 days by continuous use.
3. Silver nanoparticles increase the efficiency of scrub.

Conclusion - The newly formulated scrub by using silver nanoparticles are performing various promising properties and attributes that might open new opportunity for development of more effective, safe and cost effective scrub.





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# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

(Re-accredited with 'A' Grade by NAAC with CGPA 3.12)



Ms. Jayashri  
Santosh Ade

M.Sc.-I Year (Sem-II)  
Chemistry

Contact

Department of  
Chemistry

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

E.Mail. : [shri\\_r\\_l\\_t\\_college\\_of\\_science\\_akola@yahoo.com](mailto:shri_r_l_t_college_of_science_akola@yahoo.com)

## ❖ Homemade HERBAL HAIR OIL

### • Introduction

Natural ingredients nourish the hair and make them lustrous and bouncy. You can find many of these magical ingredients in your kitchen , and if you know the right recipe, you can prepare your home made hair oils that will make your hair look glorious and gorgeous. So I will share my DIY oil recipes to infuse life in dull hair. Following DIY hair oils will not only help you to keep the hair in good condition but also enhance hair beauty, by adding shine , body and bounce to them.

### • Ingredients

Mustard seeds, Fenugreek seeds, cloves, amla , onion, Heena Leaves, hibiscus flowers and leaves, curry leaves, Tulsi leaves, Durga grass, coconut oil etc .

### Procedure

1. Take a pan containing coconut oil, heat it on medium flame .
2. Add 1 tbsp mustard seeds , 3 tbsp Fenugreek seeds ,cloves 7 to 8 , 7 tbsp grated amla , 1 grated onion to the oil , And then stir it .
3. Then add Henna leaves handful, hibiscus Leaves handful, hibiscus flowers 20, Tulsi leaves handful,curry leaves handful,Durga grass 15 springs and stir it . Boil 15 minutes until dark.
4. Filter immediately. Cool completely. Then store it in air tight jar .

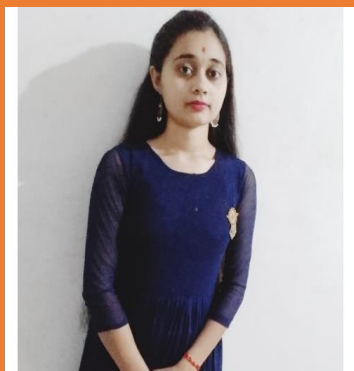




The Berar General Education Society's

# SHRI R. L. T. COLLEGE OF SCIENCE, AKOLA

(Re-accredited with 'A' Grade by NAAC with CGPA 3.12)



Ms. Vaishnavi  
Mahendra Gawande

M.Sc.-I Year (Sem-II)  
Chemistry

Contact

Department of  
Chemistry

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

E.Mail. : [vaishnavi@shrilts.ac.in](mailto:vaishnavi@shrilts.ac.in)

## Introduction: ❖ Extraction Of Natural Dye From Plant:

Dyes are one of the most important uses of the plants. Recently, interest in the use of natural dyes has been growing rapidly due to the result of stringent environmental standards imposed by many countries in response to toxic and allergic reactions associated with synthetic dyes. As a result with a distinct lowering in synthetic dyestuff costs, the natural dyes were virtually unused at the beginning of twentieth century. Nowadays in most of the countries, natural dyeing is practiced only as a handcraft and synthetic dyes are being used in all commercial dyeing processes. However with the worldwide concern over the use of eco-friendly and biodegradable materials, the use of natural dyes has once again gained interest.

### Material Required:

- Knife
- Vegetable grater
- Tripod stand
- Mesh

### Plants Used

- Peacock flower ( *Caesalpinia pulcherima*)
- Bougainvillea ( *Bougainvillea glabra*)
- Beetroot ( *Beta vulgaris*)
- Red cabbage ( *Brassica oleracea*)
- Onion skin ( *Allium cepa*)

### Procedure:

The workstation was covered with the newspaper. Fresh vegetables and flowers especially with bright colors were selected. The skin was peeled and grated using vegetable grater for better extraction. 5-10 gms of grated vegetables was added to 100ml of distilled water and was boiled well until the dye was released in water. Preparation of Mordant :

#### Alum

0.748g of Alum and 0.187g of Washing soda were mixed in 100ml of water and was stored for further use. Vinegar

50 ml of 5% acetic acid is mixed with 100ml of water. From that 25ml of it were taken and mixed with 100ml of distilled water.

#### Salt

5 g of Sodium chloride was mixed in 100ml of distilled water and was used as a mordant and stored for further use. The vegetable is prepared. In another pot, the "fixative" recipe is prepared. It is brought to a light boil and the fabric is added. The fabric is simmered in the fixative for at least an hour. After an hour, the fabric is carefully pulled out from the simmering fixative and is wrung out completely. Next, a new pot with the "fixed" fabric is taken. The fixed fabric is immersed in the dye which is already extracted. It is then boiled and simmered until the fabric takes up the dye at least for an hour. The fabric is then removed and placed on the newspaper or tile to dry. Since the fabric takes up the dye it is ready to be used for commercial purpose. Phytochemical Test

