

## PHYTOCHEMICAL INVESTIGATION AND ETHNOMEDICINAL STUDY OF WILD VEGETABLE: AMARANTHUS SPINOSUS L.

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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,

Korku, Pawara and Gawali tribal people are interviewed and brief discussions was made in local language.

A number of plants have been used by tribal as medicine which have been recorded by (Upadhye A. S.et.al) and (Rothe, S. P. (2003)).The collected plant species were identified by using flora of S.Y Kamble and Pradhan Maharashtra. Researchers have identified number of compounds used in mainstream medicine which were derived from "ethnomedical" plant sources. (Rajbhandari, K.R). *Amaranthus spinosus* Linn. (Spiny amaranth- English; TanduliyahHindi) has its own traditional use. The tender leaves are eaten as vegetable by the people. Decoction of leaf and root is taken for intestinal disease. Root juice is taken with cold water in the morning to treat painful urination and is also taken with warm water before going to bed to break and dissolve gravel and to pass it out along with urine.Tender leaves are eaten as vegetable (Amit Subedi.et.al) and.( Govindarajan R 2005 et.al) Young shoot is taken as vegetable after proper boiling by people. Decoction of leaves and root is also taken for intestinal disease . Root paste is applied on boils to remove pus and root juice is recommended in case of fever. Crushed leaves and roots are applied to skin infections, wounds and rheumatic areas.

#### **Collection of Plant Material for phytochemical investigations:**

The plant material of *Amaranthus spinosus* was collected at their flowering season and authenticated using flora and Herbarium.

Extraction: The aerial parts were shade-dried in laboratory. They were randomly sampled, foreign organic matter (FOM) were removed and grinded with a grinder to obtain the powder. A sieve of 500 micron was used for sieving powder. 400 g of sieved powder was extracted in soxhlet's extractor using solvent of increasing polarity starting from nHexane (nonpolar) to Chloroform, Ethanol and Water. The extracts were concentrated by rotatory evaporator and they were stored at 4°C for phytochemical and biological evaluation.

Phytochemical Screening: Phytochemical screening was performed using standard procedures (Halilu M.E.et.al.) and (Hussain

Zeashana et.al). By using different specific reagents, the presences of main groups of natural products were detected in n-Hexane (nonpolar) to Chloroform, Ethanol and Water extracts.

a. *Detection of alkaloids*: Extracts were dissolved individually in dilute Hydrochloric acid and filtered. The filtrates were used to test for the presence of alkaloids.

i) Mayer's Test: Filtrates were treated with Mayer's reagent (Potassium Mercuric iodide). Formation of a cream precipitate indicates the presence of Alkaloids.

ii) Wagner's test: Filtrates were treated with Wagner's reagent (Iodine in potassium iodide). Formation of reddish brown precipitate indicates the presence of alkaloids.

iii) Dragendroff's test: Filtrates were treated with Dragendroff's reagent (solution of potassium bismuth iodide). Formation of reddish brown precipitate indicates the presence of alkaloids.

b. *Detection of carbohydrates*: Extracts were dissolved individually in 5 ml distilled water and filtered. The filtrates were used to test for the presence of carbohydrates.

i) Molisch's Test: Filtrates were treated with 2 drops of alcoholic a - naphthol solution in a test tube and 2 ml of conc. sulphuric acid was added carefully along the sides of the test tube. Formation of violet ring at the junction indicates the presence of carbohydrates.

c. *Detection of cardiac glycosides*

i) Killer-killani test: To 0.5 gm of extract diluted to 5ml with distilled water and add 2 ml of glacial acetic acid and containing one drop of ferric chloride solution. This was underplayed with 1 ml of conc. sulphuric acid. Brown ring at the interface indicates the presence of a deoxysugar characteristic of cardenolides.

d. *Detection of saponins*

i) Foam test: Small amount of extract was shaken with little quantity of water. If foam produced persists for ten minutes it indicates the presence of saponins.

*e. Detection of phytosterols*

i) Salkowski's Test: Extracts were treated with chloroform and filtered. The filtrates were treated with few drops of Conc. Sulphuric acid, shaken and allowed to stand. The appearance of golden yellow colour indicates the presence of triterpenes.

*f. Detection of proteins and aminoacids*

i) Xanthoproteic Test: The extracts were treated with few drops of concentrated Nitric acid solution. Formation of yellow colour indicates the presence of proteins.

## Results

Phytochemical screening of different extracts of *Amaranthus spinosus* is as follows.

SN	Phytoconstituents Extracts				
		Hexane	Chloroform	Ethanol	Aqueous
1	Alkaloid	-	-	-	-
2	Saponin	-	-	+	-
3	Carbohydrate	-	-	-	+
4	Tannin	-	+	-	-
5	Protein	+	-	+	+
6	Phytosterol	-	-	-	-
7	Cardiac Glycoside	+	+	+	-
8	Reducing Sugar	-	-	-	-
9	Flavonoid	+	+	+	+
10	Phenol	-	+	+	+
Note:-		Presence +	Absence -		

## Conclusion

The phytochemical screening revealed the presence of different phytoconstituents like carbohydrate, protein, saponin, tannin, cardiac glycoside, flavonoid and phenol.

The present ethnomedicinal study revealed that the tribals aborigines groups of korku, Gond, Bhill, Halba have adequate ethnomedicinal

knowledge which has been transmitted from one generation to other. These Ethnomedicinal plants drugs are safe and effective constituents of plants product. Synthetic drugs widely used in the treatment of various diseases may cause toxicity and adverse side effects, whereas herbal medicine is considered less toxic than synthetic drugs.

## References

1. Rajbhandari, K.R., Ethnobotany of Nepal. first edition ed. 2001: Ethnobotanical Society of Nepal(ESON). 189.
2. Amit Subedi, et al., Antioxidant and Antibacterial Activity of Methanolic Extract of *Machilus Odoratissima*. Kathmandu University Journal of Science, Engineering and Technology, 2012. 8 (1): p. 73-80.
3. Zheng, W and Wang S.Y. (2001): Antioxidant activity and Phenolic compounds in selected herbs. Journal of Agricultural and Food Chemistry 49 (11), 5165-5170.
4. Govindarajan R, Vijayakumar M and Pushpangadan P, 2005. Antioxidant approach to disease management and the role of 'Rasayana' herbs of Ayurveda. J. Ethnopharmacol., 99: 165-178.
5. Halilu M.E, A. Abubakar, Garba M.K. and Isah A. A: Antimicrobial and Preliminary Phytochemical studies of Methanol Extract of Root Bark of *Crossopteryx febrifuga*, Journal of Applied Pharmaceutical Science Vol. 2 (12), pp. 066-070, December, 2012
6. Hussain Zeashana, G.A., , Satyawan Singh, Chandana Venkateswara Rao, Hepatoprotective and antioxidant activity of *Amaranthus spinosus*.

7. Upadhye A. S., Vanni: V. D. and Khumojkar MS. (1994). Ethno-medico Botanical Studies in Western Maharashtra. *Ethnobotany*, 6: 25-31.
8. Bhamre P. B. (1998). Traditional knowledge of plants for skin ointments of Dhule and Nandurbar Distn'ct, Maharashtra(India). *J . Phytol. Res.* 11(2): 195-196.
9. Rothe, S. P. (2003). Ethnomeidicinal plants from Katepuma Wildlife Sanctuary of Akoln district, *Indian Jour. Of Tradj. Knowledge*, Vol. 2(4), Oct, 2003, pp 378-382.