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Dr. Prerana Badoni

Associate Professor, Department of Agriculture, Tula's Institute, Dehradun, Uttarakhand, India

Dr. Teena Agrawal

Associate Professor, Department of Bioscience and Biotechnology, Banasthali Vidyapith, Rajasthan, India

Taxonomy of the Amaranthaceae family in Banasthali Vidyapith campus

Dr. Prerana Badoni and Dr. Teena Agrawal

Abstract

Amaranthaceae is the angiosperm family, commonly known as the amaranth family. The name of the family is based on the genus *Amaranthus*. The characters of the family are based on the Chenopodiaceae family, some of the features resemble the prickly flowers family. Overall, the family contains 160 genera and around 2000 species, the exact number of the families varies litt to litt. The lineages of the family with the Caryophyllales orders in APG IV. Most of the species in the family are herbs, herbs may be annual in nature, they may be perennials in nature in some shrubs as well as the vines, lianas, and weeds are also found in this case. Many species have stems with swollen nodes, when secondary growth occurs in the stem, and roots, anomalous secondary growth can be seen, this anomalous secondary growth provides the means for adaption in the harsh environment to facilitate the growth of the plants. The leaves are simple, mostly alternate, and rarely opposite arrangement of the leaves can be seen. Stipules are rare in this family, they are found in the form of a very small outgrowth. The flowers are solitary, aggregates found in the form of the spikes, cyme, or panicles of the aggregates. Flowers are actinomorphic, complete, hermaphrodites, completes, with bracts, bracteoles. They are generally small. Some species have unisexual flowers perianth mostly five or ten, are found in groups of the pentamerous. One to five stamens opposite to tepals are found on the hypogynous disc. Fruits are utricles, the persistent calyx is the very unique feature of the family, C3 and C4 photosynthetic pathway has been seen in the family, and C4 pathway in many families lead to the divergent evolution.

In this research article, we are trying to present the Amaranthaceae family of the Banasthali Vidyapith, Newai, Banasthali Vidyapith has a large campus, a number of the flowering plants of the various taxonomy can be seen over there, in the monsoon season in the bare land a number of the plants with differing taxonomic status can be seen, in this research papers, we are focusing in the Amaranthaceae family having around 10 genera, since grazing is very common there, so some of the young plants are eaten by the grazing animals over there. Overall this is a small research paper on the taxonomy of the Amaranthaceae family which is very useful for the student of the BSC and MSc students who are reading the taxonomy as a subject.

Keywords: Amaranthaceae, angiosperm family, chenopodiaceae, Banasthali Vidyapith, C3 and C4, grazing animals, pentamerous

Introduction

The family Amaranthaceae family consists of the 165 genera and 2000 Species. Plants are found in the tropical and subtropical regions, generally, some of the species of the families grow in the summers and winter but several genera can be seen in the monsoon season. A long belt of the many plant genera can be seen in the rainy season. On our campus, we have seen around 9 genera of the taxonomic values. Some of the genera like, *Amaranthus* (10 species), *Achyranthus* (09 species), *Aerva* (08 species), *Celosia* (09 species), *Chenopodium* (10 species), *Digera* (06 species), *Alternanthera* (03 species), *Cyathula* (05 species), and *Gomphrena* (07 species) can be seen during the monsoon periods. Many of the genera are eaten as vegetables, some the eaten raw, and many of the species are eaten regularly by the wild tribes for the edible and medical aspects. The main objective of the work is to familiarize the student of the campus with the utility of the local flora as well as the medicinal and taxonomic importance of the flora available nearby for conservation of the plants ^[1-16].

Material and Methods

The present study is based on the field visits during the season from July 2017 to June 2018. A total of nine genera belonging to the Amaranthaceae family were reported & identified near the campus there is a large sanctuary name the Ranthambore tiger sanctuary in the tonk, here are a number of the tribal species can be seen, they use the plants for the several purposes.

Corresponding Author

Dr. Prerana Badoni

Associate Professor, Department of Agriculture, Tula's Institute, Dehradun, Uttarakhand, India

Usually, a survey of the work was done with the people attached with the locally available flora like the hakims who were young, old, and had experiences of their work.

The collected specimen wear was identified with the standard litt. of the taxonomy. All the collected plant specimens were kept in the herbarium of the University of Rajasthan, Jaipur. [11-16]

Result & Discussion

The present research work is based on the identification and utilization of the local flora by the tribes of the nearby villages. All the plant enlisted in the papers has several medicinal values, and some of the plants have been used for the modern phytochemistry investigation in addition to several pharmacological investigations.

1. *Achyranthes aspera*

Taxonomic description plants are annuals, one of the species a porphyristachya has a perennial nature. The height of the plants varies from 40 to 120 cm. leaves are few, elliptic, obovate, and alternate arrangements. Leaves are pubescent, full of small hairs, flowers are small, they are found on the long spikes, as the flowers open in the spikes, they deflexed on the branches.

Local name: Apang

Habit: Herb

Habitat: Generally in the moist places, soil having the moisture, loamy soil.

Phenology: Throughout the year

Status of occurrence: Commonly found in all agricultural lands, in the rainy season a long belt of the plant's community can be seen, they germinate in July and develop in large numbers in November with long flowering spikes as well as fruits.



Fig 1: *Achyranthes aspera* in the field. (Source: amazon.in)

Medicinal uses: Plants are laxative, carminative, astringent, good uretic, found effective in renal dropsies, also used in cough, pneumonia and rheumatism, piles, kidney stones, the ash of the plant is used against asthma and cough, the ashes are used in the treatment of the ulcers.

The solution of the roots is very effective against ulcers and asthma, many tribes use these extracts of the roots for the treatment of the diseases. Seeds are used in hydrophobia. Plant extract of leaves and roots possesses antifungal activity. Voucher number:

2. *Aerva lanata* (L)

Taxonomic description: An erect and sub erect herb, Annual and perennial herb, plants are the 14-19 cm, long, they are found in dense growth in the rainy season. Leaves are elliptical, in the entire margin, hairs are present in the young stages, as the maturity of the leaves starts, hairs start to shed off. Sometimes the structures of the hairs are used for the taxonomic significance.

Inflorescences are spikes, axillary spikes found in the axil of the leaves or branches.

Local name: Chaya

Habit: Herb

Habitat: Wet moisture soil, especially in the rainy season.

Medicinal use: Plant is used as the diuretic, vermifuge, leave and root extracts I used in the cough and sudden swelling.



Fig 2: *Aerva lanata* in the field. (Source: amazon.in)

3. *Alternanthera sessilis* (L)

Taxonomic description

Annuals, as well as perennials, prostrate herb, leaves opposite, somewhat fleshy, oblong, lanceolate, flowers are in axial heads which are sessile.

Habit: Herb

Habitat: on the wet soil, during the rainy monsoon season, during the month of July to September a long, population of the herb can be seen with the other vegetation of the *Amaranthus* plant.

Phenology: The plant grows in the rainy season, and flowers after two months of growth, later on, the seed formation, seeds are buried in the land and new vegetation arises.



Fig 3: *Alternanthera sessilis* in the field. (Source: amazon.in)

4. *Amaranthus spinosus*

Taxonomic description: An annual herb, the height of the herb ranges from 10 to 40 cm in the field.

Leaves are long, obovate, ovate, and sessile sometimes small petioles can be seen, margins are entire, and reticulate venation.

Roots are tap root systems, later on, the taproot system converts into the adventitious root system. In some of the habitats swollen roots can be seen, which store the reserved food materials.

Inflorescences are the long spikes, with the sessile flowers, the fruits are very important, they are long spikes and eaten as raw vegetables or used as the vegetables by the human being for the vegetable formation.



Fig 4: *Amaranthus viridis* in the field. (Source: amazon.in)

Medicinal properties

The plant is cooling, laxative pubescent, a decoction of the herb is used in the treatment of the many disorders of the digestive system as well as the respiratory system, sometimes the extracts of the leaves is also used for the treatment of the tooth disorders.

In addition in the rainy season some of the members of the family like the other species of the *Amaranthus*, *Celosia* (9), *Chenopodium* (10), *Digera* (6), *Alternanthera* (3), *Cyathula* (5), and *Gomphrena* can be seen.

All genera of the family are of the annuals and perennial herbs, they all have the long spikes, sessile flowers, and colorful patterns of the petals, many of the specie is used for ornamental purposes, and some of the species are used for the medical purposes [1-10].

Conclusion

Overall this is a small article of the angiosperm family Amaranthaceae family, the plants are herbs, shrubs, and rare trees, they are generally annuals, biennials, perennials, and all the members possess the spikes as the inflorescences, flowers are small sessile and with long tufts of the bracts and bracteoles, fruits are long pods, which are eaten a raw and as well for the edible and medicinal point of view, this is a small work of the family taxonomy for the students of the BSC and taxonomy.

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