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FLORISTIC BIODIVERSITY OF AQUATIC FLORA OF BHANDARA DISTRICT (M. S.)

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ABSTRACT:

Bhandara district of east Vidarbha region is rich in perennial lakes, ponds, ditches, rivulets and streamlets etc., hence it is said to be Lake District and most of these water bodies are rich in aquatic flora. This paper deals with the floristic composition and distribution of vascular hydrophytes, which are classified into four different categories. There are 82 taxa belonging to 34 families of flowering plants, which belongs both primitive families like Nymphaeaceae, Onagraceae, as well as advance like Cyperaceae, Poaceae etc. Taxonomic details, habit, habitat and their distribution have been provided.

Key words: - *Bhandara District, Floristic, hydrophytes..*

INTRODUCTION:

Hydrophytes are plants normally growing in water and also include plants inhabiting swampy or marshy habitats containing a quantity of water which would prove much more than optimal for the average land plant. It will be evident that hydrophytes are subject to less extremes of temperature than land plants for the watery habitat in which the plants grow certainly takes longer to be heated and also longer to cool. Aquatic plants are essential parts of natural aquatic systems and form the basis of a water body's health and productivity.

The most of water bodies are near or beside to the villages are being polluted by villagers for their daily activities like washing of cloths, animals etc. In many large lakes fish culture is practiced which also interferes the aquatic ecology by humans during the fishing. This adversely affects the floristic diversity of the aquatic plants in it.

The aquatic flora is of great use in fish-culture, which is practiced on large scale in the district. Most of the water bodies are used for the cultivation of *Trapa* for fruits and *Nymphaea* for the flowers and fruits. This provides employment to the local peoples. Some of the aquatic plants are also used for various economic uses.

The district is the eastern part of Vidarbha region and is rich in many large and small perennial lakes, ponds, ditches, rivulets and streamlets etc., hence it is well known as ***Lake District*** and most of these water bodies are beside villages and are rich in aquatic flora.

The present paper deals with 82 plant species belongs to 34 families of angiosperms both Dicot and Monocot found in aquatic habitats during the floristic exploration of the district from 2005 to 2011.

There are many classifications of aquatic plants like the classification given by Arber, A. R. (1920), Penfound, W. T. (1952), Danserau (1945), Hejny (1957, 1960), Luther (1949), Hartog, C. den and Segal, S. (1964), etc. The most convenient and easy method of classification was given by British ecologists, Tansley, A. G. (1949), Spence (1964) and Sculthorpe, C. D. (1967).

MATERIAL AND METHODS :-

To study the aquatic flora of the district, extensive and intensive visits were arranged to various regions of the district in different seasons. The plants were observed in their natural habitat and the phenological data were collected and recorded in the field diary. The multiple specimens of plants in flowering and fruiting stage were collected, identified, preserved and their herbarium sheets and or museum specimens were prepared. The field notes were incorporated with the specimens on the herbarium sheets.

The digital photographs of some unique plants were taken with their unique characteristics that can help in identifying the plants in the natural habitat.

All the specimens of the taxa have been deposited in the herbarium / Museum of Department of Botany, Dharampeth M. P. Deo Memorial Science College, Nagpur.

RESULTS AND DISCUSSION

In present paper the aquatic flora collected and or studied from the district are classified into four different groups as follows ***(Photo Plate-1)***:

1. **Free floating hydrophytes:**

These plants are not attached to the substratum inside the water body. The plant body floats on the surface of water with root system inside the water and rest of the part of the body above the water surface. These include four plant species as: *Trapa natans* L. var. *bispinosa* (Roxb.) Makino, *Ceratophyllum demersum* L., *Eichhornia crassipes* (Mart.) Sohms, *Pistia stratiotes* L. and *Wolffia arrhiza* L.

2. **Submerged or Suspended hydrophytes:**

Submerged are either attached to the substratum by means of roots or may not attached but are completely grows inside the water. These include ten plant species as: *Utricularia aurea* Lour., *Utricularia scandens* Benj., *Utricularia stellaris* L. f., *Ceratophyllum demersum* L., *Blyxa octandra* (Roxb.) Planch. ex Thw., *Hydrilla verticillata* (L.f.) Royle, *Vallisneria spiralis* L., *Najas graminea* Del., *Najas indica* (Willd.) Cham. and *Najas marina* L.

3. **Floating leaved hydrophytes:**

These plants are usually perennial hydrophytes with rhizomatous stock in the soil at the bottom of water body. They grow usually with flexible petioles so that the leaves are adjusted to float on the surface of water. These include seven plant species as: *Nymphaea nouchali* Burm. f., *Nymphaea pubescens* Willd., *Nymphaea rubra* Roxb. ex Salisb., *Nymphoides hydrophylla* (Lour.) O. Ktze, *Ottelia alismoides* (L.) Pers., *Sagittaria guayanensis* H. B. & K. ssp. *lappula* (D. Don) Bogin. and *Aponogeton natans* (L.) Engl. & Krause

4. **Emergent or amphibious or marshy hydrophytes:**

These plants usually grow on exposed or submerged soils and most of plants are perennial due to rhizomatous or cormous underground stem. These include sixty one plant species as: *Nelumbo nucifera* Gaertn., *Cleome chelidonii* L. f., *Tamarix ericoides* Rollt., *Bergia ammannioides* Roxb., *Drosera indica* L., *Ammannia baccifera* L., *Ammannia multiflora* Roxb., *Rotala verticillaris* L., *Ludwigia adscendens* (L.) Hara, *Ludwigia hyssopifolia* (G. Don) Exell., *Ludwigia octovalvis* (Jacq.) Raven, *Mollugo pentaphylla* L., *Wahlenbergia marginata* (Thunb.) A. DC., *Lobelia alsinoides* Lam., *Rotula aquatica* Lour., *Ipomoea aquatica* Forssk., *Ipomoea carnea* Jacq. subsp. *fistulosa* (Mart, ex Choisy) Austin, *Bacopa monnieri* (L.) Penn., *Glossostigma diandrum* (L.) O. Krtz., *Limnophila aquatica* (Roxb.) Alston, *Limnophila indica* (L.) Druce, *Microcarpaea minima* (Koen. ex Retz.) Merr., *Hygrophila schulli* (Buch.-Ham.) M. R. & S. M. Almeida, *Phyla nodiflora* (L.) Greene, *Persicaria barbata* (L.) Hara, *Crinum viviparum* (Lam.) R. Ansari & V. J. Nair, *Monochoria vaginalis* (Burm. f.) K. B. Presl, *Commelina diffusa* Burm. f., *Murdania nudiflora* (L.) Brenan, *Tonningia axillaris* (L.) O. Ktze., *Typha angustifolia* L., *Alocasia macrorhiza* (L.) G. Don., *Colocasia esculenta* (L.) Schott, *Sagittarria trifolia* L., *Butomopsis latifolia* (D. Don) Kunth, *Cyperus distans* L. f., *Cyperus flabelliformis* Rottb., *Cyperus nutans* Vahl var. *eleusinoides* (Kunth) Haines, *Fimbristylis microcarya* F. v. Muell., *Fimbristylis ovata* (Burm. f.) Kern, *Fimbristylis schoenoides* (Retz.) Vahl, *Fimbristylis tetragona* R. Br., *Fuirena ciliaris* (L.) Roxb., *Indocourtoisia cyperoides* (Roxb.) Bennet & Reiz., *Kyllinga nemoralis* (J.R. & G. Forst.) Dandy ex Hutch. & Dalziel,, *Schoenoplectus articulatus* (L.) Palla, *Schoenoplectus corymbosus* (Roth ex R. & S.) J. Raynal, *Schoenoplectus supinus* (L.) Palla, *Scirpus affinis* Roth, *Scirpus grossus* L. f., *Scleria parvula* Steud., *Arundinella pumila* (Hochst. ex A. Rich.) Steud., *Coix lacryma-jobi* L., *Elytrophorus spicatus* (Willd.) A. Camus, *Eulalia trispicata* (Schult.) Henr., *Ophiuros exaltatus* (L.) O. Ktze., *Oryza rufipogon* Griff., *Oryza sativa* L., *Paspalidium flavidum* (Retz.) A. Camus, *Sacciolepis interrupta* (Willd.) Stapf, *Vetiveria zizanioides* (L.) Nash

As stated above there were 82 hydrophytes collected from the district which are categorized or classified into four groups, belongs to 34 families of angiosperms. The most dominant families of these plants species are Cyperaceae, Poaceae, Scrophulariaceae, Hydrocharitaceae, Nymphaeaceae, Lythraceae, Onagraceae, Lentibulariaceae, Commelinaceae, Najadaceae and Alismataceae **(*Graph-1*)**.

Out of the total plant species recorded, most of the species i.e., *Sixty one* are from Emergent or amphibious or marshy habitats. These plants usually growing in water lodged soils and adopted for similar type of habitats. *Seven* plant species falls in the category of Floating leaved hydrophytes. These plants are submerged and only leaves are floating on the surface of water. *Ten* plant species are found in the submerged hydrophytes category. These plants may be or may not be attached to the substratum by means of their root systems. *Four*

plant species were recorded as free floating hydrophytes ***(Pie Chart-1)***.

Most of the aquatic flora studies found common or infrequent in various parts of the district. Some of the species are restricted to particular area and are found to be absent in other parts of the district. Among the aquatic flora of the district rarely found species are: *Drosera indica* L., *Rotala verticillaris* L., *Wahlenbergia marginata* (Thunb.) A. DC., *Lobelia alsinoides* Lam., *Rotula aquatica* Lour., *Glossostigma diandrum* (L.) O. Krtz., *Sagittarria trifolia* L. and *Arundinella pumila* (Hochst. ex A. Rich.) Steud.

The various small and medium sized water bodies beside and around the villages are being shallow day by day. Even many water bodies are used for washing the clothes by local people, this result in increase in the water pollution in it. This adversely affects the aquatic flora of the district. To fulfill the drinking water need for the future there is need to conserve all the water bodies of the district so that it will fulfill the basic need as drinking water and also help in conservation of aquatic flora of the district.

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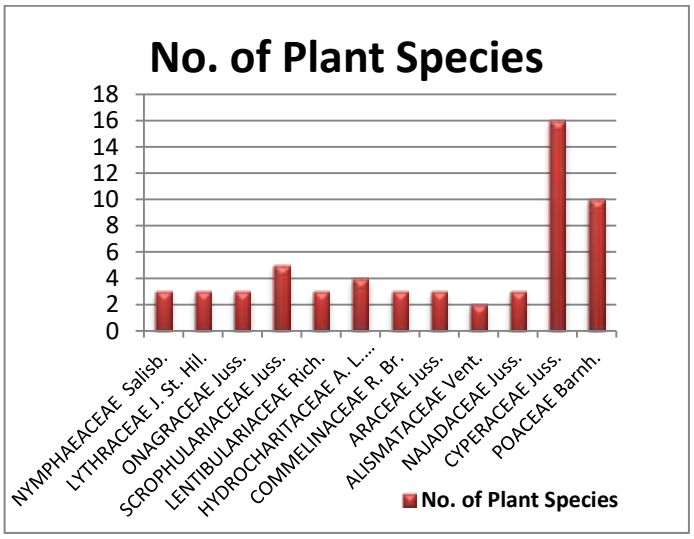
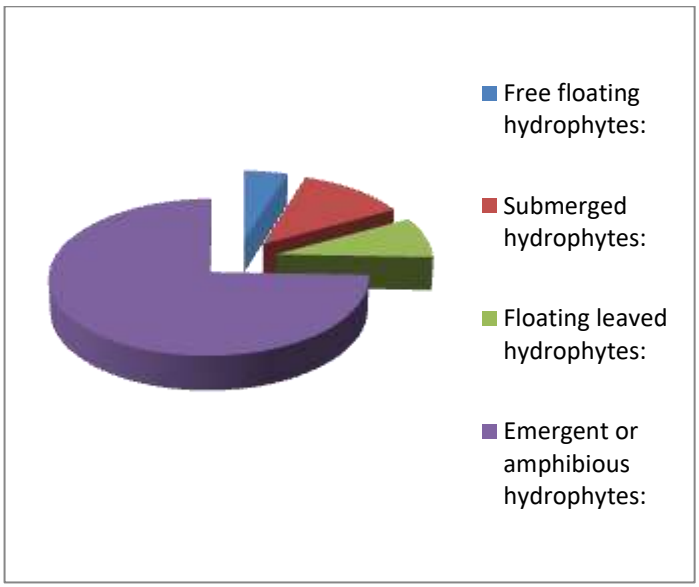


Graph 1: Family wise no. of plant species.



Pie Chart-1: Classification of Hydrophytes


Nymphaea nouchali Burm. f.


Nelumbo nucifera Gaertn.


Utricularia stellaris L. f.


Ottelia alismoides (L.) Pers.


Sagittaria guayanensis H. B. & K. ssp. lappula (D. Don) Bogin.


Aponogeton natans (L.) Engl. & Krause


Blyxa octandra (Roxb.) Planch. ex Thw.


Hydrilla verticillata (L.f.) Royle

Photo Plate -1