

A Critical Study of Aquatic and Marshy Angiospermic Diversity of Bihar

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ABSTRACT

As producers, aquatic and marshy angiospermic plants are most important component in aquatic and wetland ecosystems. It is therefore necessary to record and to assess the diversity and potentiality of these aquatic plant communities. In the present study on aquatic and marshy angiosperms of Eastern Uttar Pradesh, 201 species belonging to 115 genera of 50 families were identified. Out of total 201 species, 107 were dicot species belonging to 65 genera of 33 families while 94 species were monocot belonging to 50 genera of 17 families. During the survey of studied area *Ceratophyllum submersum* L. was first time reported from Gangetic plain.

Keywords : *Ceratophyllum Submersum* L., Cultural Diversity

INTRODUCTION

India constitutes major portion of the Indian sub-continent having such a landmass in the world, which is blessed with a variety of geographical land and much cultural diversity. The wide range of climatic conditions, dense forests, rich and tranquil expanses of meadows, perennial rivers and fertile soil helps India boasts of its rich variety of vegetation that no other country in this world can boast of. The vegetation of Indian flora fluctuates from one region to other. In this regard, an up to date and comprehensive flora is an essential tool for the study of plants of any area and to assess their utility. The comprehensive account of hydrophytic plants of India and Burma were published by Biswas and Calder (1937). Later, Subramanyam (1962) published a volume on aquatic plants of India, followed by an enumeration of aquatic plants of India by Deb (1976). Cook (1996) published a volume on aquatic and wetland plants of India covering northern boundary of India (Arunachal Pradesh, Himanchal Pradesh, Jammu & Kashmir and Sikkim). Monographs have been prepared for only a few groups of aquatic plants (Subramanayam & Balakrishanan 1962, Subramanyam & Abraham 1968, Singh 1972, Subramanyam 1979, Kumar & Banerjee 1999, Kothari 2001).

Bihar is one of the largest states of Gangetic Plain. Several botanists and plant explorers have contributed to the flora of various part of Bihar. With special reference to aquatic and marshy angiospermic plants the prominent workers are Maliya & Singh (2004), Singh & Srivastava (2007a, 2007b). District Mainpuri has been explored by Maliya (2006), district Lalitpur has been explored by Ranjan (1996), district Hamirpur by Bhattacharyya and Malhotra (1964), Narain (2006), district Eatwah

Treatments of all the aquatic plants of any considerable area are few. Floras and catalogs frequently reveal a paucity of information about the aquatic phanerogams and their distribution. On many occasions it was found that in study of the flora of a region the aquatic angiosperms frequently received the least consideration.

The perusal of literature indicates that Bihar has received due attention from botanical point of view, yet there is lack of comprehensive floristic account for various remote localities. Considering the vast stretch of Uttar Pradesh, it is desirable to make proper investigation by selecting certain specified areas with limited boundaries to explore extensively. Due to rapid pace of urbanization, formation of new human settlements and industrialization these aquatic habitat are in severe threat of extinction. It is therefore an urgent and utmost need to record and to assess the diversity and potentiality of these aquatic plant communities before they will vanish forever. The present study which is the result of six year of extensive collection is an effort to do proper investigation, record and assess the diversity and potentiality of these aquatic plant communities in North Bihar Muzaffarpur.

A systematic, intensive and critical floristic and ethno botanical exploration of study area i.e. North Bihar was done in the time span of five years. During the exploration all areas were explored in all the three seasons, so as to collect plants in flowering and fruiting and to note the seasonal changes. Generally 4-6 specimens for each species of plants were collected after making observation on the habit, habitat, frequency of occurrence, association, color of the flowers, which cannot be observed from dried herbarium sheets. Information regarding medicinal or other uses, if any and vernacular names were gathered from local people. All these information's were recorded in field notebook.

Identification

Identification is the process through which a specimen is identified by its characters with the help of standard worldwide or Indian flora viz. Hooker (1872-1897), Bailey (1949), Benthams (1866), Dassnayake & Fosberg (1991), Duthie (1903-1929), Fasset (1940), Raizada (1976), Cook (1996) and local flora viz. Mishra & Verma (1992), Verma *et al.*, (1997), Singh *et al.*, (2001) and others. The specimen were identified by the genus and species keys and compared with full description and illustrations, thereafter it was carefully compared with earlier identified plants of that species or variety as the case may be. Literature was consulted and collected from library of National Botanical Research Institute (NBRI), Lucknow, Botanical Survey of India (BSI), Central Circle, Allahabad, and Library of Department of Botany, University of Allahabad. Herbarium specimens kept in Herbaria of NBRI, BSI (Central circle) and Duthie herbarium of University of Allahabad were studied for identification and matching of plants.

RESULTS AND DISCUSSION

The present study is based on the results of extensive survey and study on aquatic and marshy angiospermic plants of eastern Uttar Pradesh. The plants which have been included in the present study are those plants normally found in nature growing in association with running or standing water whose level is at or above the surface of the soil. The plants may be floating, completely submerged or partly submerged in the water. In some instances the plants may merely be growing near the water but in definite association with it. However, individual plants found growing under these conditions have not been included if it was not their normal habitat.

In the present study, aquatic and marshy angiospermic plants have been classified into seven life forms depending upon nature and type of habitat and their contact with soil, air and water. Among 201 species collected during the survey, 142 species have been recorded as wetland hydrophytes (WL) as they grow in soil saturated with water. Next to them are emergent amphibious hydrophytes (EA) with 24 species. The roots, the lower portion of the stem and in some cases even the lower leaves of these plants are submerged under water. 10 species have been recorded as submerged anchored hydrophytes (SA). These species are entirely or for the most part of their life cycle in contact with soil and water only. 10 species have been recorded as floating leaved anchored hydrophytes (FLA). These are in contact with soil, water as well as air. 7 species have been recorded as free floating hydrophytes (FF). These plants are in contact with water and air only. 6 species have been recorded as suspended hydrophytes (SH) as these plants are rootless and are in contact with water only. Only 2 species have been found to be floating shoots anchored hydrophytes (FSA).

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