

**Biodiversity of Vascular Plants in some Ponds and Lakes  
of Karimganj District, Assam with special  
Reference to their Ethnobotanical uses by Maimhals,  
the Muslim Fishermen Community**

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**ABSTRACT**

The fresh water bodies are fast disappearing due to ever-increasing human activities. In Karimganj district of Assam, although most of the permanent water bodies have survived, all other aquatic ecosystems have faced threats of extinction. Vast areas of seasonally flooded plains have been converted to rice monoculture and many ponds and lakes have been filled up to accommodate human habitation, urbanization and industrialization.

This paper presents a checklist of some aquatic and wetland plants of Karimganj district and their uses by *Maimhals*, the Muslim fisherman community of the area. It also presents the role of socio-cultural aspects of the community in conservation of fresh water wealth.

**INTRODUCTION**

The vascular plants of fresh water ponds, lakes and streams present great diversities of life forms. Some of them float on water surface; some are rooted while others remain completely under water. These plants play important role as producer in aquatic ecosystems. They are most abundant in shallow productive lakes and ponds. But with the rapid urbanization and industrialization the fresh water bodies are fast disappearing causing a threat to the aquatic flora and fauna.

The state of Assam is gifted with many riverine and tectonic lakes (70,000 ha) which constitute 81% of the total lentic area. In Karimganj district about 6395 ha is under *beel* area while 3247 ha and 10367 ha are under ponds and swamps respectively (Statistical data book of Karimganj, 2008). The district abounds in wetland the shore of which is inhabited by a large population (2.1 lakhs) of maimhals (or mahimals), the Muslim fishermen community. These people have been dwelling in wet lands for several centuries and they know the exact location and uses of aquatic and wet land plants.

The aquatic vascular plants of India have been studied by Biswas and Calder (1936), Deb (1975), Cook (1996), and others. The wet land flora of Assam was studied

by Kanjilal (1934-40), Islam (1989), Malakar (1995) and Astapati *et al* (2002). There has been attempt to study the aquatic and wet land plants in harmony with mankind by Malakar and Choudhury (1997), Ghosh (2005) and many others, but the studies on utilization of aquatic and wetland plants by *Maimhals*, the people who are basically wet land dwellers still may be an interesting venture. Further, this work also attempts to highlight socio-cultural aspects of the community in conservation of fresh water resources.

## THE STUDY AREA

The geographical focus of the study is mainly Marjadkandi area of Karimganj district. Lying between longitude 90°15' to 92°25'E and latitude 24°15' and 24°55' N covering an area of 1809 sq. km., Karimganj district was originally part of the Sylhet district of Bengal province. In 1947, when India was divided, Sylhet merged with East Pakistan (now Bangladesh). Karimganj, only a small part of Sylhet, remained in India and was merged with Cachar district of Assam. In 1983, Karimganj received the status of a full fledged district.

Karimganj district is known for its vast aquatic and wetland areas. Lake Sone (locally called Sone beel), the largest fresh water lake of Assam which measure approximately 3458 ha at full storage level is situated in the district. There are three river systems viz. Kushiara, Longai, and Shingla flowing through the districts.

Weather of the district is generally humid with an average rainfall of 2500 mm per annum. The average temperature ranges from 9.20C to 37.20C. The rainy season spreads from April to September while the remaining months are more or less dry. Physiographically the district exhibits high hill ranges (Chatachurra peak 2087 ft above sea level) and some low hill regions (Patharia range peak – 800 ft above sea level) with undulating plains and some low lying depressions.

## The People

From time immemorial a large number of Bengali people have depended for their livelihood on fishing and related occupations. Fishermen in rural Barak Valley usually live a community life in neighborhood around the water bodies. They co-operate closely with one another not only in fishing or in the utilization of fishing grounds, but also in economic and social activities. Aboriginal people of the locality, they have created tradition of love and respect for each other and the environment in their pattern of daily life.

The fishermen of Barak Valley mainly belong to four major sects viz. *Jalik Kaibarta*, *Patni*, *Namasudra* and *Maimhal*. While the first three castes are Hindus, *Maimhals* (Persian word *mahe* means fish and *mohol* means body) are Muslims. They are concentrated in North East region of Bangladesh including Kishoreganj, Sunamganj and Sylhet and in India three district of Barak Valley, Assam viz. Cachar, Karimganj

and Hailakandi. They are possibly oldest Muslim fishing group in Bengal. They use simple and traditional fishing equipments, traditional nets and non motorised boats.

Tarkasaraswati (1920) stated that along with *Patni*, *Jalik Kaibarta* and *Namasudra*, there had been another caste called *Naujibi Das* who lived on income from boat sailing. But there were no trace of this caste even hundred years before. Among the first three castes there were marital relations. Before the advent of Muslim, a bulk of population of the region was fishermen by profession, they ranked very low in the social hierarchy. When Hajarat Saha Jalal invaded Sylhet in 1328, it is said that a large number of fishermen embraced Islam with the hope that new religion will provide social justice to them. These converted people formed the present day *Maimhal* community (Haque, 1985). There are some similarities in the culture of *Patnis* and *Maimhals*. *Pat* means boat - *Patnis* are generally boatmen or fishermen. Tarkasaraswati (1920) hinted that, perhaps, to differentiate this caste from the fish trader *Jalik Kaibartas*, they used to be called *Patni*. He also pointed out that *Naujibi Das* could have some relationship with the *Patnis*. However, it is also possible that there was large scale conversion of *Naubiji Das* or *Patnis* into *Maimhals*. The *Jalik Kaibartas* said to have descended from the early Dravidian invaders (Sarma & Ali, 2005). Although the origin and ancestry of *Patnis* and *Naujibi Das* are shrouded with mystery, the Dravidian ancestry may be attributed to the *Patnis*, *Naubiji Das* and so also *Maimhals* till further evidences are obtained in this regard.

The total population of Karimganj district is 10,07,976 of which 13% is Scheduled Caste community including *Kaibarta*, *Patnis* and *Namasudra*. The *Maimhals* represent about 20% of the total population. In 1970s a socio-economic survey was conducted by Planning Forum of Karimganj College in Panighat, a *Maimhal* village under Karimganj district which revealed that these people live much below the poverty line (Choudhury,1985). They have not been given Scheduled Caste status and in last 38 years their condition has further deteriorated.

## METHODOLOGY

Sampling and data collection was done in the rich wetlands of Karimganj in which *Maimhals* have been fishing for centuries. The period of sampling was April 2005 to March 2006. The plants were identified with the help of standard literature like Biswas & Calders (1995), Cook (1996), Ghosh (2005) and others. In some cases, identifications were confirmed using herbarium of Botanical survey of India. The plants are recorded in alphabetical order of the families.

The information regarding uses of wetland plants have been obtained from the elderly people of *Maimhal* community who are engaged in fishing business and collect aquatic plants for use. There are some people who have knowledge about medicinal plants and they provided ethno- medico -botanical information.

## Enumeration of species (Pteridophytes)

### Azollaceae

***Azolla pinnata*** Br. ssp. ***asiatica*** saund & Fowl : ***kuti pana*** ; small plants, free floating, found in ponds, tanks, beels and rice fields. The use of *Azolla* as biofertilizer is not known to the villagers. Bhattacharya 568.

### Marsileaceae

***Marsilea minuta*** L. : ***Sushni shak***, The plant may be semi aquatic to completely aquatic, variable, petioles may be 2 - 8 cm on land and 30 cm or more in water. The leaves are used as vegetable; common. Bhattacharya 569.

### Parkeriaceae

***Ceratopteris thalictroides*** (L) brong. The sterile and fertile leaves different, found in ponds, tanks and rice fields used as vegetable, Bhattacharya 570.

### Salviniaceae

***Salvinia cucullata*** Roxb, floating leaves wide, bearing simple hairs. dried plants are used as manure, Bhattacharya 571.

***Salvinia molesta*** Mitch : Main stem easily break ; the adaxial surface of leaves ; Fish food, Bhattacharya 572.

### Polypodiaceae

***Microsorium pteropus*** (Bl) Copel : Creeping rhizome irregularly branched. Some plants may grow in *beel* , permanently submerged. Bhattacharya 572.

## Enumeration of species (Angiosperms)

### Alismataceae

***Sagittaria sagittifolia*** L. SSp ***leucopetala*** (Miquel) Hartog : Locally callede ***tirmukhi***. It is a stoloniferous tuber with emergent leaves; grows in shallow ditches, Tubers are edible. Bhattacharya 523.

### Amaranthaceae

***Alternanthera philoxeroides*** (Martius) Grisebach : ***Jalsakhi***; semiaquatic herb with floating emergent stem. Young shoots are used as vegetables, Bhattacharya 524.

***A. sessilis*** (L.) Br. ex de candolle : ***Sanchi***; semiaquatic herb found in shallow water, used as vegetable. Bhattacharya 525.

### Apiaceae

***Centella asiatica*** (L.) Urb : *Thunimankuni*; Stoloniferous creeping stem with reniform leaves; semi aquatic herb. Used as supplementary vegetable and also as medicine to cure stomach disorders. Bhattacharya 527.

***Oenenthe javanica*** (Bl.) de candolle : *Panturasi*; Semi aquatic herb growing in swamps, used as vegetables. Bhattacharya 528.

### Aponogetonaceae

***Aponogeton natans*** (L.) Engl. & Krause : *Ghechu*; Submerged floating leaf with small tubers; found in tanks and ponds, rare. Tubers are edible, Bhattacharya 526

### Araceae

***Colocasia esculenta*** (L.) Scott : *Kachu*; common aquatic herb growing near the sides of shallow tanks, irrigation canals and lakes. *Kachu* is a favourite vegetable of the *Maimhals*. They eat rhizome, leaf, petiole and sucker in separate preparations. The petioles are chopped into pieces and cooked with prawns. The subaerial stem is cooked with *shidal* into a specially prepared dry fish. Bhattacharya 529.

***Pistia stratiotes*** L. : Stoloniferous free floating with subsessile leaves; weed. Bhattacharya 530.

### Asteraceae

***Eclipta alba*** (L.) Hassk : *Keshut* ; erect, prostrate semiaquatic herb mostly growing on the side of the *beels*. Leaf extract is used to improve hairs. Bhattacharya 530.

***Enhydra fluctuans*** Laur: *Heloncha* ; very popular among *Maimhals* for its medicinal properties. It is believed that the boiled leaves can act against helminthes. Raw leaves improve eye power, common aquatic herb. Bhattacharya 531.

### Ceratophyllaceae

***Ceratophyllum demersum*** L. Common in shallow *beels*, generally give a bottle brush appearance. Considered to be a fish food. Bhattacharya 532.

### Commelinaceae

***Commelina benghalensis*** L. : Common in the ditches and rice fields. Decoction of dried leaves used against rheumatic pain. Bhattacharya 530.

***Floscopa scandens*** Lour. : Plant creeping below, erect above with terminal inflorescences. Mostly found in swamps. Common. Bhattacharya 535.

### Convolvulaceae

***Ipomoea aquatic*** Forssk : *Kalmishak*; plants aquatic or semiaquatic with solitary flowers, usually found in stagnant water, young shoots used as vegetable by the *Maimhals*, common. Bhattacharya 536.

***Ipomoea fistulosa*** Mart ex. Chois : Jeol; small shrubby plants of about 2.5m growing by the banks of ditches or sides of the rice fields. Used as hedge plants in rural areas common. Bhattacharya 537.

### Hydrocharitaceae

***Hydrilla verticillata*** (L.) Royle : A submerged weed grown in ponds and beels. It is a good fodder of herbivorous fishes, common. Bhattacharya 539.

***Ottelia alismoides*** (L.) Pers : *Panikala, Kechair*; the submerged plants with broad leaves remain rooted, flowers are emergent. The young twigs and fruit are used as vegetables. The petioles are cooked with prawns. Common in ponds. Bhattacharya 540

***Vallisneria spiralis*** L. : *Pata shaola*; submerged aquatic herb. The plant is considered as weed in fresh water beel. Bhattacharya 541.

### Hydrophyllaceae

***Hydrolea zeylanica*** (L.) Vahl : Stems prostrate, semiaquatic, leaves with brown spots. Lef extract used in minor cuts. Bhattacharya 538.

### Lemnaceae

***Spirodela polyrhiza*** (L.) Schl : *Khudi pana*; a free floating plant. good feed for grass carp, duck etc. coomon. Bhattacharya 545.

***Wolffia globosa*** (Roxb.) Hartog : *Khudi pana*; fronds floating, ellipsoidal, common. Bhattacharya 546.

### Marantaceae

***Schumanianthus dichotoma*** (Roxb.) Gag. : *Murta*, shrubs attaining a growth of 2m or more, grwos near ditches. Used for preparation of Shittal Paty, a kind of mat. Bhattacharya 548.

### Menyanthaceae

***Nymphoides hydrophylla*** (Lour.) Kuntze : Floating hearts are found in most beels. Known to have medicinal property against jaundice. Boiled stems are used as vegetable, common. Bhattacharya 550.

***Nymphoides indica*** (L.) Kuntze : Floating leaves with rhizomatous root stock. Rhizome is eaten as vegetable, common. Bhattacharya 551.

### **Nymphaeaceae**

***Euryale ferox*** Salisb. : *Ghengy*; thick rhizome, large floating leaves densely prickly. Seeds are eaten by *Maimhals* in fried and puffed condition. Rhizome is also cooked with fish head. Bhattacharya 552.

***Nymphaea nouchali*** Burn f : *Bhet* ; it is a rooted hydrophyte and popular food among *Maimhals*, the fruiting torus is eaten raw ; petioles and peduncles are cooked into curry with small prawns. The rhizome is a good vegetable, common. Bhattacharya 553.

***Nymphaea pubescens*** Wild : *Chukhi* ; an aquatic plant with rhizomatous stock. The petioles, peduncles, rhizomes, tender flowers and seeds are consumed after cooking. The peduncles are chopped and made into curry with small prawns. In the night when the *Maimhals* remain in wetlands to catch fish, they collect the fruits of *chuki* and eat raw. Bhattacharya 556.

### **Nelumbonaceae**

***Nelumbo nucifera*** Gaer : *Padma* ; the rhizomatous plant with emerging leaves bear very beautiful flowers. To Hindus lotus is a sacred flower offered in worship of goddess *Durga, Laxmi, Basanti, Manosa* and others. The *Maimhals* collect the flowers for selling. Rhizome, peduncle and fruiting torus are used as vegetables. Seeds when immature are eaten raw. Not so common. Bhattacharya 557.

### **Onagraceae**

***Ludwigia adnascens*** (L.) Hara : Stems prostrate and ascending, usually floating and bearing many white spongy pneumatophores. The extract of leaves are used to cure ailments of male reproductive system. Bhattacharya 558.

### **Pontedariaceae**

***Eichhornia crassipes*** (Mart.) Solms-Laubach : *Jarmani phena* is a common weed in ponds and tanks. Used as fodder. Bhattacharya 562.

***Monocharia hastata*** (L.) Solms-Laubach : A semiaquatic herb used as fodder. Common. Bhattacharya 563.

### **Serophulariaceae**

***Bacopa monnieri*** (L.) Penn : *Brahmi*, a semi aquatic herb found in rice fields. Used to improve memory and also as nerve tonic. Bhattacharya 569.

***Limnophila heterophylla*** (Roxb.) Benth. : *Jhanji* ; submerged plant found in ponds and tanks, used against helminthes. Bhattacharya 575.

### Poaceae

***Hygroriza aristata*** (Retz) Nees ex Wright : *Panighas* ; a stoloniferous aquatic herb, common. Used as fodder. The extract of leaves are applied to cure skin diseases. Bhattacharya 576.

### Trapaceae

***Trapa natans*** L. Var. *bispinosa* (Roxb.) Makino : *Singara*; stems elongated, mostly simple, flexible, submerged bottom rooted. Fruits edible. Bhattacharya 580.

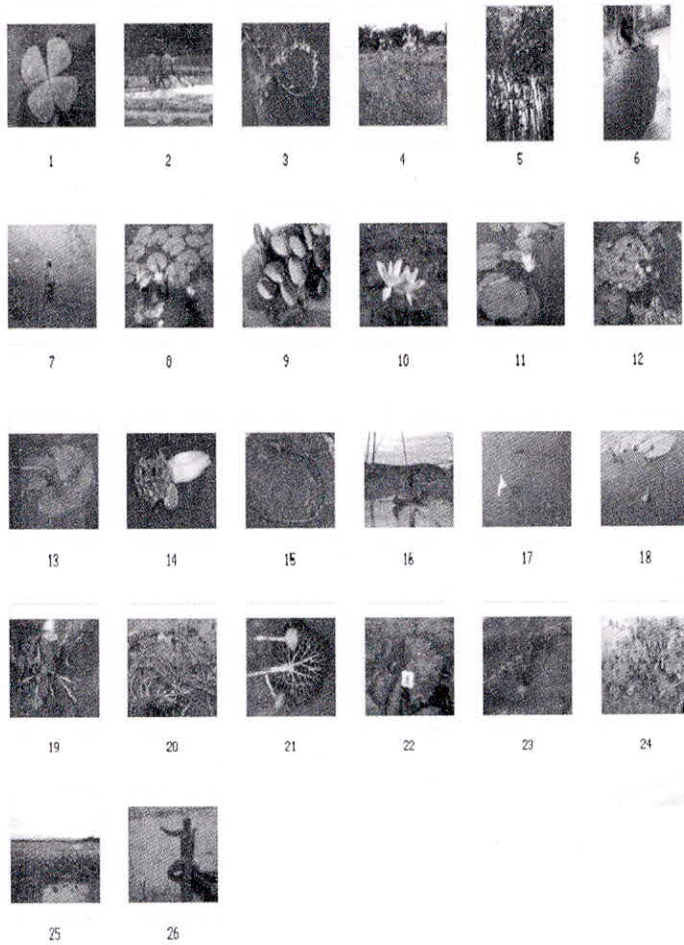
## DISCUSSION

Aquatic plants are integral part of lake and its aging process. These plants generally grow most abundantly in shallow productive lakes - "old" lakes that have accumulated thick sediments. In the present work, aquatic plants have been studied from two lakes and one ha or which belonged to "middle" or "old" age . The total species reported here is 41 including 6 species of pteridophytes belonging to 5 families and 35 species of angiosperms belonging to 21 families. It may be stated here that Dey and Kar (1989) studied aquatic macrophytes of Sone, the largest tectonic lake of Assam and reported 23 species.

Historically, humans have utilized aquatic plants as food source. *Maimhals* collect edible roots, shoots, fruits and seeds. They also collect aquatic plants as fodder for domestic animals. In the present paper mainly the plants which have some uses to the *Maimhals* are reported. It is important to emphasize that aquatic plants have an important role to play in the life style of *Maimhals*, the Muslim fishermen community. They are socially and economically very backward class of people who had preferred conversion to Islam 650 years back in search of social justice. But, practically they are still regarded as the inferior class. Moreover, since Islam preaches class less religion, these people could not enjoy benefit of schedule caste reservation provided by the Government. In rural areas due to isolation and relatively better access to wetland (a Bengali dish is incomplete without at least one preparation of fish and these people are engaged in fishing from time immemorial) they have developed knowledge about utilization of wet land resources. They possess substantial information regarding floating, rooted, submerged and emergent hydrophytes along with fishes and other aquatic fauna.

The *Maimhals* are dependent on the water resources for their livelihood in different ways. For example, the root stock of *Aponogeton natans*, *Nelumbo nucifera*, *Nymphaea nouchali* and *N. pubescens* are rich in starch. These species have been found to be common in the present work. Kar and Barbhuiya (2000) have also reported *Nelumbo nucifera*, *Nymphaea nouchali* from this region along with 25 other aquatic macrophytes.





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| 1. <i>Marsilea minuta</i>                  | 14. <i>Nelumbo nu</i>                    |
| 2. Mimhals in fishing                      | 15. <i>Iponoea aquauca</i>               |
| 3. <i>Ludwigia adnascens</i>               | 16. Traditional fishing net              |
| 4. <i>Iponoea fistulosa</i>                | 17. <i>Ottelia alismoides</i>            |
| 5. <i>Schumarianthus dichotoma</i>         | 18. <i>Nymphea pubascens</i>             |
| 6. A mat prepared from <i>S. dichotoma</i> | 19. <i>Trapa natans</i>                  |
| 7. A mimhal boy collecting aquatic plants  | 20. <i>Euryale ferox</i>                 |
| 8. <i>Nymphea pubascens</i>                | 21. <i>Euryale ferox</i>                 |
| 9. <i>Salvinia cucullata</i>               | 22. Insect on <i>Trapa natans</i> flower |
| 10. <i>Nelumbo nucifera</i>                | 23. <i>Hydrilla verticillata</i>         |
| 11. <i>Nymphea nouchali</i>                | 24. <i>Hygroriza aristata</i>            |
| 12. <i>Nymphoides indica</i>               | 25. Aquatic weed covering entire pond    |
| 13. <i>Nymphea nouchali</i>                | 26. Traditional fishing net              |

**Figs. (1 to 26) Biodiversity of Plants in Ponds**

It has been observed during the present survey that the *Maimhals* prefer to eat many aquatic plant products raw *i.e.* without cooking. Actually most of them remain whole night in the wetlands for fishing and during that hour they eat raw plant products for example fruits of *Nymphaea nouchali*, *Nymphaea pubescens* and *Trapa natans*. The flowers of water lilies are said to be remedy for heart diseases. Seeds of lotus are prescribed for piles and elimination of ring worm.

Many plant parts are eaten after cooking with fish or prawn. They also take leafy vegetables like *Altarnenthera philoxeroides*, *A. sessiles*, *Bacopa monieri*, *Ipomoea aquatica* etc. The *Jeol* plant (*Ipomoea fistulosa*) is used for construction of fences. *Schumanianthus dichotoma* belonging to Marantaceae has been found economically very important because *Shital Paty*, a beautiful mat, is prepared from the fibers extracted from this plant

Regenerative wetland resources have been consumed since ancient times by local fishermen for wet land products, herbal medicine, cultural needs and many of their daily requirements. For them rivers lakes and *haors* provide a means of survival, not just an area from which resources can be exploited for short term benefits. The traditional knowledge system of these maimhals is thousand of years old and is still evolving. This involves not only the aquatic flora and fauna for food and medicine, but also the strategies for their conservation and management. They would extract rhizome of a plant only when it has matured and produced seeds. They teach the young boys to not to destroy aquatic plants because these are fish foods.

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