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Studies of some important wetland plants with their growth form and uses from Monoha beel of Morigaon, Assam

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Abstract

Morigaon district of Brahmaputra valley of Assam with its tropical climate with moderate to heavy rainfall harbours many smaller to larger wetlands where different types of wetland plants can be seen. These aquatic plants have important role on the productivity of the water body and also some plants are economically important for human being. A study on different types of wetland plants or macrophytes of Monoha beel of Morigaon, Assam was carried out from January 2011 to July 2012. During the study, 27 species of economically important plants under 19 families were identified along with their growth form, flowering and fruiting time and their uses. It was observed that out of 27 species, 16 species were more valuable in terms of economic use. *Chara* spp.used as larvicidal, *Riccia* spp. as soil binder, *Azolla pinnata* as green manure, *Aeschynomenc aspera u*sed as fodder, *Ipomoea carnea* used as firewood, *Ipomea aquatica*, *Rannuculus scleratus* and *Polygonum barbitum* as medicine, *Diplazium exulentum, Marsilea, Rorippa indica, Nymphea lotus, N. stellata, Euryle ferox, Trapa bispinosa, Alternanthera sessilis* as food of human being.

Keywords : Macrophyte, Fodder, Soil binder, Monoha.

1. Introduction

Morigaon district is situated in between the latitude 25 30′ N and longitude 92 15′ E on the south bank of the river Brahmaputra. Total land area 15877 sq Km. Number of wetlands 183, covering an area of 11658 ha. The beels are of mixed types i,e lake like and oxbow type. Besides Brahmaputra, Sonai, Kolong and part of Kopili river flows down stream through various parts of the district.

Wetland and aquatic plants comprise highly diverse groups with a lot of hybrids, which together form a very rich gene pool. Aquatic and wetland plants, including algae, water ferns and allies are the major producers of aquatic food chain. Large, floating-leafed plants are the sitting and dwelling places for many aquatic insects, mollusks, leeches and amphibians, nesting roosting grounds of birds. Submerged plants are the generators of oxygen in the aquatic system. In controlled growth situation, aquatic plants purify water, but if uncontrolled growth takes place, they can reach the level of pest and are frequently regarded as aquatic weeds. Aquatic plants can reduce biological oxygen demand.

The present work is aimed to study different kinds of macrophytes, their growth forms, flowering and fruiting time and also the economic importance.

2. Study area

Monoha beel lies at Latitude 26°12′ 10″ N and Longitude 92°09′ 5″ E respectively. Maximum depth of the beel is 7.4 m, mean depth 4.2 m. It

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is a closed system but during monsoon season the beel inundates nearby rice fields and joins with other beels of the area viz, Pakoria, Debika, Saru Monoha and Garanga. No known source of pollution enters in to the water body. The beel has four channels in four directions. The south-eastward channel is about 1.81 Km, north-westward 1.24 Km, northeastward 0.5 Km and south-westward 0.66 Km. The width of the channels varies from 75 to 85 meters. The total catchment area of the beel is 73 ha, maximum depth of the beel is 7.4 m, mean depth of the beel is 4.2m, maximum width of the beel is 1128m and maximum length of the beel is 2400m.

3. Materials and method

The collection and observation of macrophyte was done by visiting the wetland during different seasons viz premonsoon, monsoon, retreating monsoon and winter of the January 2011 to July 2012 from different zones of the beel. Collected plants were preserved for identification.

The plants were identified with the help of identification keys of Cook (1990), Edmondson (1992), Needham & Needham (1980),Takhtajan (1980), Bedell & Reveal (1982), Fassett (2006).

4. Results

During the investigation 27 species of macrophytes were identified under 19 families. - 2 sps. from Characeae, 1 Ricciaceae, 1 Athyriaceae, 1 Dryppteridaceae, 1 Azolloceae, 3 Marselieceae, 1 Parkeriaceae, 1 Thelypteridaceae, 1 Ranunculaceae, 1 Brassicaceae, 3 Nymphaeaceae, 1 Onagraeceae, 2 Trapaceae, 3 Convolvulaceae, 1 Fabaceae, 1 Lentibulariaceae. 1 Acanthaceae, 1 Amaranthaceae and 1 Polygonaceae.

It was observed that out of 27 species, 16 species were more valuable in terms of economic use. *Chara* spp.used as larvicidal, *Riccia* spp. as soil binder, *Azolla pinnata* as green manure, *Aeschynomenc aspera u*sed as fodder, *Ipomoea carnea* used as firewood, *Ipomea aquatica*, *Rannuculus scleratus* and *Polygonum barbitum* as medicine, *Diplazium exulentum, Marsilea, Rorippa indica, Nymphea lotus, N. stellata, Euryle ferox, Trapa bispinosa, Alternanthera sessilis* as food of human being.

Table - 1 : Macrophytes of monoha beel

	Species	Family	Growth Form	Habitat	Flowering & Fruiting	Uses
A. Macro Algae	*Chara sp.*	Characeae	vittate	Clayey hard bottom	Jan-Apr	Larvicidal
	Nitetta sp.	Characeae	vittate	Silty bottom	Sept–Dec	
B. Bryophytes	*Riccia sp.*	Ricciaceae	Tenagophyte	Moist soil	Jan-Feb	Soil binder
C. Pteridophytes	*Diplazium exulentum*	Athyriaceae	Helophyte	Edge of water course	July-Nov	Food
	Dryopteris sp.	Dryppteridaceae	Helophyte	Edge of water course	July-Nov	
	Azolla pinnata	Azolloceae	Pleuspophyte	Floating		Green manure
	Marsilea sp.	Marselieceae	Hyperhydrate	Edge of water course	Aug-Dec	Vegetable food
	Salvinia natans	Marselieceae	Hyperhydrate	Edge of water course		
	Salvinia cucullata	Marselieceae	Hyperhydrate	Edge of water course		
	Ceratopteris thalictroides	Parkeriaceae	Tenagophyte	Muddy edge	July-Nov	
	Thelypteris dentata	Thelypteridaceae	Tenagophyte	Marsh edge	July-Nov	
D. Angiosperms	*Rannuculus scleratus*	Ranunculaceae	Hyperhydrate	Muddy water body	Jan-Apr	Medicine
	Rorippa indica	Brassicaceae	Hyperhydrate	Marsh edge	Dec-July	Food
	Nymphea lotus	Nymphaeacea	Epyhydrate	Muddy	Feb-June	Food
	Nymphea stellata	Nymphaeaceae	Epyhydrate	Muddy	Feb-June	Food

	Euryle ferox	Nymphaeaceaa	Epyhydrate	Muddy	Feb-June	Food
	Zussiaea repens	Onagraceae	Hyperhydrate	Muddy water body	June-Sept	
	Trapa bispinosa	Trapaceae	Epyhydrate	Muddy water body	June-Nov	Food
	Trapa natans	Trapaceae	Epyhydrate	Muddy water body	June-Nov	
	Ipomoea aquatica	Convolvulaceae	Epyhydrate	Water body	Mar-Dec	Food & medicine
	Ipomoea carnea	Convolvulaceae	Yperhydrate	Edge of water course	Apr-Jan	Fire wood
	Ipomoea reptans	Convolvulaceae				
	Aeschynomenc aspera	Fabaceae	Tenagophyte	Water body	Sept-Nov	Fodder
	Utricularia sp.	Lentibulariaceae	Vittate	Water body	Nov-Mar	
	Asteracanth longifolia	Acanthaceae	Hyperhydrate	Edge of water course	Sept-Dec	
	Alternanthera sessilis	Amaranthaceae	Helophyte	Edge of water course	Apr-Sept	Food
	Polygonum barbetum	Polygonaceae	Tenagophyte	Edge of water body	July-Jan	Medicine

Tenagophyte = Juvenile submerged, adult muddy terrestrial
Hyperhydrate = Emergent aquatics (lowest part almost always in water).
Epyhydrate = Bottom rooted with floating leaves.
Vittate = Submerged leaves
Cook (1990)

5. Discussion

During investigation of the aquatic macrophytes of Monoha beel, three different aquatic communities were recognized. These are free floating; bottom rooted free floating leaftype and submerged hydrophytes. Submerged communities in deep water are *Ceratophyllum demersum Linn, Hydrilla verticillata, Valisnaria spiralis Linn* etc. Among the free floating *Eichhornia crassipes Solms, Lemna* sp, *Azzola pinnata* R. Br. Among these *Eichhornia* occupied the major part of the beel. Maximum growth recorded in the year 2011-2012 during August-mid October and minimum during March-April. *Trapa bispinosa* which is one of the cash crop for local people shows peak growth during June-mid July. *Hydrilla verticillata* was present in Monoha beel throughout the period of the investigation. Another important cash crop *Eurile ferox* Salisbury was in its peak growth during June. Due to excessive growth after death, the plants produces excessive amount of nutrients which pollute water and impart foul smell to the water (Oomanchan, 1988). The presence of excessive aquatic vegetation influences the management of water in natural water ways. (Pandit & Ashok, 2002).

All these macrophytes establish unique phyto-community and normal beauty of the beel. These aquatic and semi aquatic plants have the unique adaptation and economic impact of the area of Monoha. Several economic utilities of those macrophytes are investigated by gathering information from the local people residing in around Monoha beel. Though people are using aquatic macrophytes for food and fodder as well as biofuel, yet it is very necessary to develop sustainable food and fibre system. Aquatic plants are still an underutilized resource and their use should be considered for other system also. On the other side all aquatic weed interfere with the normal flow of water system (Murphy; 1988). Moreover some dominating species like *Eichhornia crassipes* Solms, *Ottelia alismoides, allisneria spiralis.* Linn, *Potamogeton pectinatus* etc create some disadvantageous situations to the water bodies like O_2, CO_2 balance; compete for space with fishes and reduction in pond productivity (Mandal, 2007). Therefore excessive growth of aquatic weed in the water bodies can create serious socio-economic problem and side by side economic loss of water resources.

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