
Macrophytes Biodiversity of Dudhala Lake of Bhadrawati, District- Chandrapur (M.S.), India.

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Abstract : A macrophyte is an aquatic plant that grows in or near water and is either emergent, submergent or floating. In lakes macrophytes provide cover for fish and substrate for aquatic invertebrates, produce oxygen, and act as food for some fish and wildlife. Macrophytes is an important factors for helping in maintaining ecological balance. Aquatic macrophytes play a pivotal role in maintaining primary productivity of water ecosystem. Aquatic macrophytes includes a vast majority of aquatic vascular plants. They are found mainly in the shallow regions of ponds, lakes, rivers, swamps and streams etc. They are of considerable ecological and economical importance. The present paper describes the macrophytes biodiversity of Dudhala lake of Bhadrawati town located in the Chandrapur district of Maharashtra State from January 2013 to December 2013 in which 16 species representing 15 families belonging to 5 groups such as 3 Submerged floating weeds, 3 Rooted floating leaves weeds, 1 Rooted emergent with heterophile weeds, 6 Free floating suspended submerged and 3 Rooted submerged hydrophytes.

Key words- Macrophytes, Dudhala lake, Biodiversity.

Introduction

Aquatic macrophytes play a vital role in healthy ecosystems. They serve as primary producers of oxygen through photosynthesis, provide a substrate for algae and shelter for many invertebrates, aid in nutrient cycling to and from the sediments, and help stabilize river and stream banks.

Aquatic macrophytes are also respond to the changes in water quality and have been used as indicator of pollution of pollution in several cases (Westtake, 1981 and Best, 1982). The Dudhala lake is principal freshwater body located in Kunbi Society of Bhadrawati town of Chandrapur district, Maharashtra State, India. It is situated at about 221 m above MSL and at 20°06' 32.0" N latitude and 79°6' 15.3" E longitude and the area of Dudhala lake is 27 acre.

During the last few decades considerable studies on aquatic macrophytes from different freshwater bodies of India and abroad have been carried out by researchers like, Unni, (1971), Crowder *et al.*, (1977), Zutshi *et al.*, (1980), Billore and Vyas (1981), Islam (1990), Kodarkar, (1996), Salaskar, (1998), Dey and Kar (1999), Bhaumik *et al.*, (2004), Kumar and Pandit (2005), Ghavzan *et al.*, (2006), Devi and Sharma (2007) and so on.

However very little information is available about the aquatic macrophytes of Bhadrawati region. This work has therefore undertaken of document the aquatic macrophytes of Dudhala lake of Kunbi society of Bhadrawati.

Materials and Methods

Macrophytes in shallow waters were collected directly while those from deeper water with the help of long handled hook. On collection the specimen were thoroughly washed, excess water soaked with filter paper, kept in polythene bags lined with filter paper and brought to the laboratory and preserved in 10% formalin and observed. The specimens were identified up to species level as per the guidelines of Kodarkar (1994).

The aquatic macrophytes were collected for the period of 1 years i.e. January 2013 to December 2013.

Result and Discussion

Aquatic macrophytes have served humans well over the centuries, providing food, medicines, and building materials. The ancient Egyptians regularly harvested water lilies (*Nymphaea* spp.) for human consumption. Herodotus, the Greek historian, described the practice in the fifth century BC; lilies were dried and seeds were pounded or ground into flour, which was used to make bread. Other parts were eaten raw. Various *Nymphaea* species are still cultivated in the Orient for their fruits, seeds, and rhizomes. In Africa, various tribes dig up the starch-laden rhizomes for food.

Aquatic plants serves as a good source of food to mankind and animals thus forming a palatable food for water birds and a best for aquatic wild life conservation practices (Kiran *et al.*, 2006).

Aquatic vesicular plants are important indicator of water pollution (Seddon, 1972 and Shimoda, 1984). Aquatic plants are important as they serve as substratum to different micro and macro fauna (Raut and Pejawar, 2005).

In the present study altogether 16 species representing 15 families belonging to 5 groups such as 3 Submerged floating weeds, 3 Rooted floating leaves weeds, 1 Rooted emergent with heterophile weeds, 6 Free floating suspended submerged and 3 Rooted submerged hydrophytes. The data is tabulated in Table No. 1.

Submerged floating weeds represented by three species such as *Vallisneria americana*, *Myriophyllum exalbescens* and *Ceratophyllum echinatum*. Submerged weeds are weeds that are rooted on the bottom of the pond, Floating weeds are plants that float on the surface of the pond or lake.

Rooted floating leaves weeds represented by three species such as *Nymphaea tuberosa*, *Nelumbo lutea* and *Marsilea quadrifolia*. Plants that float on the surface and rooted on the bottom are included in this group.

Rooted emergent with heterophile weeds represented by only one species such as *Sagittaria Sp.* Emergent aquatic macrophytes are defined as plants that are rooted in shallow water with vegetative parts emerging above the water surface.

Free floating suspended submerged represented by six species such as *Lemna minor*, *Azolla caroliniana*, *Wolffia Sp.*, *Salvinia rotundifolia*, *Pistia stratiotes* and *Nymphoides*. They rooted in mud along margin and send out long creeping and floating stem.

Rooted submerged hydrophytes represented by three species such as *Potamogeton crispus*, *Ipomoea aquatic* and *Hydrilla Sp.*. Submerged aquatic macrophytes are usually rooted in the bottom soil with the vegetative parts predominantly submerged.

Several workers have conducted macrophytes survey in lakes from different parts of India viz. Alwar lakes , Alwar, Rajasthan Vyas (1964), Udaipur lake, Udaipur, Rajasthan Paliwar (1984), Sagar lake, Sagar, Madhya Pradesh (Joshi

et al., 1987), Sharma and Singhal (1988) recorded 11 species of macrophytes from a tropical lake. Sarrornagar lake, Hyderabad, Andhra Pradesh (Kodarkar, 1996), Meshram and Dhande (2000) also recorded the aquatic macrophytes in Wadali lake, Amraoti and stated that the macrophytes stimulate the growth of phytoplankton and help in the recycling of the organic matter. Ambasht (2005) recorded 25 species of macrophytes from Gujrat Tal, Jaunpur townshio North India. Narayana *et al.*, (2006) study the aquatic macrophytes of Husain sagar, Karanataka. in Kiran *et al.*, (2006) recorded 15 species of macrophytes the fish culture ponds at Bhadra fish farm, Karnataka. Game and Salaskar (2007) recorded the macrophytes on Malchmali lakes, Thane, Maharashtra, Saltanat Malik and Atul Namdeo (2010) recorded the 21 species of macrophytes in a polluted pond of Shahjanpur, U.P., Sheikh, J.A. et al., (2011) reported 10 species of macrophytes in three eutrophic lakes of Jhansi, Bundelkhand region, Palit and Mukharjee (2012) recorded 25 species of macrophytes in wetlands of Bankara district, West Bengal and Harney *et al.*, (2013) reported 19 species of macrophytes in three water bodies of Bhadrawati of Chandrapur District.

Conclusion

The present paper describes the macrophytes biodiversity of Dudhala lake of Bhadrawati town located in the Chandrapur district of Maharashtra State from January 2013 to December 2013 in which 16 species representing 15 families belonging to 5 groups such as 3 Submerged floating weeds, 3 Rooted floating leaves weeds, 1 Rooted emergent with heterophile weeds, 6 Free floating suspended submerged and 3 Rooted submerged hydrophytes.

However very little information is available about the aquatic macrophytes of Bhadrawati region. The aim of this work has therefore undertaken of document the aquatic macrophytes of Dudhala lake of Kunbi society of Bhadrawati. The check list generated in the study is intended to support other research in wetlands and in particular, to assure the continuity of ongoing long term ecological programmed.

Table 1 : Biodiversity of Macrophytes of Dudhala lake.

Sr. No.	Name of macrophytes	Family	Life forms
1	<i>Vallisneria americana</i>	Hydrocharitaceae	Submerged floating weeds
2	<i>Myriophyllum exalbescens</i>	Haloragaceae	Submerged floating weeds

3	<i>Ceratophyllum echinatum</i>	Ceratophyllaceae	Submerged floating weeds
4	<i>Nymphaea tuberosa</i>	Nymphaeaceae	Rooted floating leaves weeds
5	<i>Nelumbo lutea</i>	Nymphaeaceae	Rooted floating leaves weeds
6	<i>Marsilea quadrifolia</i>	Marsileaceae	Rooted floating leaves weeds
7	<i>Sagittaria Sp.</i>	Alismataceae	Rooted emergent with heterophile weeds
8	<i>Lemna minor</i>	Lemnaceae	Free floating suspended submerged
9	<i>Azolla carolimana</i>	Azollaceae	Free floating suspended submerged
10	<i>Wolffia Sp.</i>	Lemnaceae	Free floating suspended submerged
11	<i>Salvinia rotundifolia</i>	Salviniaceae	Free floating suspended submerged
12	<i>Pistia stratiates</i>	Araceae	Free floating suspended submerged
13	<i>Nymphoides</i>	Menyanthaceae	Free floating suspended submerged
14	<i>Potamogeton crispus</i>	Naidaceae	Rooted submerged hydrophytes
15	<i>Ipomoea aquatica</i>	Convolvulaceae	Rooted submerged hydrophytes
16	<i>Hydrilla Sp.</i>	Hydrocharitaceae	Rooted submerged hydrophytes

Reference

- AMBASHT, R.S. (2005) Macrophytes limnology in the Indian subcontinent. Ukaaz Publication, Hyderabad. pp.58-174.
- BEST, E.P.H. (1982) Effect of water pollution on freshwater submerged macrophytes. Water Pollution and Management review, 27-56.
- BHAUMIK, U, DAS, P, & PARIA, T. (2004) Environment and Ecology, 22 (Spl-2): 371.
- BILLORE, D.K. & VYAS, L.N. (1981) Int. J. Ecol. Sc. 7: 45.
- CROWDER, A.A., BRISTOW, J.M., KING, M.R. & VANDER, K.S. (1977) Distribution, seasonality and biomass of aquatic macrophytes in lake Opnicon. *Naturaliste., Can* (104): 441-456.
- DEVI, C.G. & SHARMA, B.M. (2007) Studies on the diversity of the macrophytes in Awangsoipat Lake (Bishnupur), Manipur, India. In: (Eds. A.K. Kandya and Asha Gupta) Biodiversity conservation and Legal aspect. Aviskar Publishers, Distributors, Jaipur: 62-71.
- DEY, S.C. & KAR, D. (1989) *Environ. Eco.* 7: 253.
- GAME, A.S. & SALASKAR, P.B. (2007) Environmental impact of macrophytes on Makhmali Lakes, Thane, Maharashtra. *J. Aqua. Biol.* 22(2): 203-204.
- GHAVZAN, N.J., GUNALE, V.R., MAHAJAN, D.M. & SHRIKE, D.R. (2006) Effect of environmental factors on ecology and distribution of aquatic macrophytes. *Asian journal of Plant Sciences*, 5(5): 871-880.
- HARNEY N.V., A.A. DHAMANI & R.J. ANDREW (2013) Biodiversity of macrophytes of three water bodies near Bhadrawati, district- Chandrapur (M.S.), India. *IJSR*, Vol. 2(9): 437- 439.
- ISLAM, M. (1990) "Advance in plant sciences" 12:35.
- JAVID, A SHEIKH, G. JELLANI & R.S. GAVALI (2011) Distribution of emergent macrophytes of three eutrophic lakes form Jhansi, Bundelkhand region. *J. Res. and Deve.*, Vol. 11: 41-48.
- JOSHI, G., A.D. ADONI & A.K. VAISHYA (1987) Ecology of Sagar Lake, Hyderabad IV (29): 151-155.

- KIRAN, B.R., PATEL, A.N., VIJAYA K. & PUTTAIAH, E.T. (2006) Aquatic macrophytes in fish culture ponds at Bhadra fish farm, Karnataka. *J. Aqua. Biol.* 21(2): 27-29.
- KODARKAR, M.S. (1996) "Conservation of Lakes", IAAB Publication No. 3, IAAB, Hyderabad.
- KODARKAR, M.S. (1994) Conservation of Saroornagar lake. Hyderabad Bachao.3 (9) : 21.
- KUMAR, R. & PANDIT, A. K. (2005) Community architecture of macrophytes in Hokarsar wetland, Kashmir, Ind. *J. Environ. And Ecoplan.* (10): 565-573.
- MESHARAM, C.B. & DHANDE, R.R. (2000) Algae diversity with respect to pollution status of Wadali Lake, Amravati, Maharashtra, India. *J. Aqua Biol.* 15 (1 &2): 1-5.
- NARAYANA, J., PURUSHOTHAMA, R., KIRAN, B.R., RAVINDRAKUMAR, K.P. & PUTTAH, E.T. (2005) Investigation of drinking water quality of Basavanahole Tank with reference to physical chemical characteristics. *Fundamental of limnology*, 201-206.
- PALIT, D. & MUKHARJEE, A. (2012) Studies on water quality and macrophytes composition in wetlands of Bankura district, West Bengal, India. *Ind. J. Plant Sci.* , Vol.1(2&3): 221-228.
- RAUT, N. & PEJAWAR, M. (2005) Survey of diversity of plankton attached to macrophytes from weed infested lake in Thane, Maharashtra. *J. Aqua. Biol.* 20(1): 1-7.
- SALASKAR, P.B. (1998) "Some environmental aspects of Powai lake", Ph.D. Thesis, Mumbai University, Mumbai.
- SALTANAT, ARA MALIK & ATUL NAMDEO (2010) Enumeration of macrophytes in a polluted pond of Shahajanpur, U.P. (India) *J. Phytology.* Vol.2(9): 14-17.
- SEDDON, B. (1972) Aquatic macrophytes as limnological indicators. *Freswat. Biol.* (2): 107-130.
- SHARMA, ALKA & SINGHAL, P.K. (1988) Impact of floating and emergent vegetation on the trophic status of a tropical lake. The macrophytes and physico-chemical status. *J. Enviro. Biol.* 9(3 suppl.): 303-311.
- SHIMODA, MICHIKO (1984) Macrophytic communities and their significance as indicator of water quality in two ponds in the Saijo basin, Hiroshima prefecture, Japan, *Hikobia* (9): 1-14.
- UNNI, K.S. (1971) An ecological study of the macrophytic vegetation of Doodhadhari lake, Rajpur, M.P. India I. Distribution and seasonal changes in aquatic plants. *Hydrobiol.* 37: 139-155.
- ZUTSHI, D.P., SUBLA, B.A., KHAN, M.A. & WANGANEO, A. (1980) Comparative limnology of nine lakes of Jammu and Kashmir, Himalaya. *Hydrobiol.* 72: 101-112.