

ENVIRONMENTAL IMPACT of Macrophytes on some Fresh Water bodies in washim District, MAHARASHTRA state, INDIA

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Abstract- Study of environmental impact of macrophytes on fresh water bodies in Washim district were undertaken during the year 2009 to March 2011. Ten species were observed belonging to different classes, out of which *Hydrilla verticillata* (L.F.) Royle, *Chara spp*, *Potamogeton pectinatus* L, *Najas minor* L. and *Ceratophyllum demersum* L. were found to be dominating. During most of the year, surface of the water, especially in the shallow areas were found to be covered with these macrophytes. However *Hydrilla verticillata* (L.F.) Royle, a rooted submerged weed was observed to be dominant on other weeds. Other less dominant macrophytes found in the fresh water bodies were *Ottelia alismoides* (L.) Pers., *Typha angustata* Bory and Choub., *Vallisneria spiralis* L. and *Limnophylla sessiflora* L.. These macrophytes were found to be responsible for reducing water storage capacity in the fresh water bodies and also cause tremendous loss of surface water of the dam through evapotranspiration. Macrophytes also reduce pond productivity by causing accumulation of silts. Due to excessive growth after death, the plants produce excess amount of nutrients which pollute the water and impart foul smell to the water. Therefore the rapid spread of aquatic weeds in the fresh water bodies in Washim district by vegetative and other means is creating serious socio-economic problems, causing enormous economic loss of water resources.

Index Terms- Environmental impact, Macrophytes, Aquatic weeds, Fresh water bodies

I. INTRODUCTION

Aquatic weeds referred to as Macrophytes constitute an important component of aquatic ecosystem. Their diversity and biomass influence primary productivity and complexities of trophic states (Kumar and Singh, 1987), Excessive growth of Macrophytes hinder navigation, choking rivers, irrigation channels, dams and lakes etc., impede drainage; interfere swimming recreation on water bodies, bathing and fishing, increase silt-deposition (Mandal, 2007). These aquatic plant problems have arisen due to global mismanagement and pollution of the environment, which favors rapid colonization of aquatic bodies by aquatic plants and the complete absence of adequate strategies for proper harnessing and control of aquatic plants. When aquatic plants massively colonize water bodies, siltation, decline in fishing and fisheries activities, disruption in water transport, increased water accident due to blockages often resulting in loss of human life are common (Obot, 1985).

II. MATERIALS AND METHODS

The study area i.e. the Washim district is located in western part of Vidarbha. The three fresh water bodies' Adan dam in Karanja tahsil, Ratanwadi Lake and Wai Lake in Manora tahsil of Washim district were selected for the present investigation in Washim district. All these water bodies supply drinking water to rural and urban areas and these water bodies are surrounded by small hills which drain water during monsoon. Collection of specimen was done with the help of hook then they were thoroughly washed and excess water soaked with a filter paper, kept in polythene bag and brought to the laboratory. Identification of the macrophytes was done with the help of literature following the methodology of Dawson and Robinson (1984), Olding, *et al.*, (2000).

III. RESULT AND DISCUSSION

The presence of excessive aquatic vegetation influences the management of water in natural waterways (Pandit and Ashok, 2002). All the aquatic weeds interfere with the static and flow water system (Murphy, 1988). In a very few location where weeds are limited in number show some advantages like, maintaining O₂ – CO₂ balance, providing food to some herbivorous fishes and also provide protection to tiny fishes from aggressive varieties. But majority of these fresh water bodies covered by weeds which cause maximum damage to them. Out of these ten species *Hydrilla verticillata* (L.F.) Royle, *Potamogeton pectinatus* L., *Najas minor* L. Forsk., *Chara spp.*, *Ceratophyllum demersum* L. observed to dominant. During most of the year except surface of the dam water, especially in the shallow areas, were found to be covered with these macrophytes. Other less dominant macrophytes found in the dam were *Ottelia alismoides* (L.) Pers., *Typha angustata* Bory and Chaub., *Vallisneria spiralis* L., *Limnophylla sessiflora* L. They all create situations which are disadvantageous to the water bodies like, choking up the water body, compete for space with the fishes, disturb dissolved O₂-CO₂ of dam water and reduce pond productivity (Mandal, 2007). Due to excessive growth after death, the plants produce excess amount of nutrients which pollute the water and impart foul smell to the water (Oomanchan, 1988). Fresh water bodies which are places of recreational and aesthetic use are badly affected by unexpected growth of aquatic weeds. Therefore the rapid spread of aquatic weeds in the fresh water bodies by vegetative and other means is creating serious socio-economic problems, causing enormous economic loss of water resources. Considering the losses caused by aquatic weeds

(Akbay, 1991) their management is of at most importance to increase the availability of water from these sources to its end users. The present work ten species of aquatic weeds belonging to different classes were observed (Table- 1)

Table 1: Environmental effect of some macrophytes of fresh water bodies of Washim district

Scientific name	Family	Common Name and Type	Effect On dam water
<i>Hydrilla verticillata</i> (L.F.) Royle	Hydrocharitaceae	Hydrilla and rooted submerged	<i>Hydrilla</i> alone dominated the other plants; it did not allow other weeds to grow in dam water and restricted the movement of organisms mainly the fishes and also provided shelter to small size predatory fishes and insects.
<i>Chara spp.</i>	Characeae	Stoneworts / Macroscopic algae	An alga is responsible for depletion of oxygen and gives an undesirable appearance and also spoils the taste of drinking water.
<i>Najas minor</i> L.	Hydrocharitaceae	Brittle naiaid/ submerged species	They are fast growing and gives undesirable appearance because blue green algae grown on this plant and also undesirable smell to drinking water.
<i>Potamogeton pectinatus</i> L.	Najadaceae	Pond weed / shallow water rooted submersed species	They are capable of absorbing nutrients through leaves, stems and roots. Severe competition exists with planktonic algae for nutrients and results in Decreased pond production.
<i>Aponogeton natans</i> L.f.	Aponogetonaceae	Floating less plant /Submerged species	They choke up the water body and responsible for reducing dam productivity. They cause loss of water through eva- transpiration, in addition cause impediment in flow of water.
<i>Ceratophyllum demersum</i> L.	Ceratophyllaceae	Common hornworts /Coontail	It has allelopathic qualities as it excretes substances that inhibit growth of cyanobacteria or blue green algae.
<i>Ottelia alismoides</i> (L.)Pers.	Hydrocharitaceae	Shallow water rooted with floating leaves hydrophyte	The leaves of plants body lies above the surface of water i.e. (column water). They compete for space with the fishes. These weeds make loss of water through eva- transpiration and disturb dissolved O ₂ – CO ₂ of pond water.
<i>Typha angustata</i> Bory and Chaub.	Typhaceae	Cat-tail (Common cat-tail) / Marginal hydrophytes species.	Plants are found along the shoreline of water body. They provide shelter to small size predatory fishes and insects.
<i>Vallisneria spiralis</i> L.	Hydrocharitaceae	Eel grass or Tape grass / shallow water submerged species.	It grows well in fresh water, not more than 3 m deep. This weed damage maximum, because it is not visible on the surface and impedes the flow of water varying upon the degree of their intensity and growth.
<i>Limnophylla sessiflora</i> L..	Plantaginaceae	Asian ambulia / Asian marshweed	They are fast growing and are able to regenerate from fragments. This species clogs irrigation and flood control canals.

Figure 1: Photographs of some Hydrophytes in fresh water bodies in Washim district.



Hydrilla verticillata (L.F.) Royle



Vallisneria spiralis L.



Ceratophyllum demersum L.



Chara spp.



Potamogeton pectinatus L.



Limnophylla sessiflora L.

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