

Aquatic Weed Biodiversity of a Shrinking Freshwater Pond Affected By Anthropogenic Activities in Bhadrawati Town of Chandrapur District (M.S.) India

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Abstract

The Bhadrawati town of Chandrapur district in Maharashtra state harbours a large number of small, medium and large water bodies. These water bodies are shrinking day by day very fast due to anthropogenic activities. In this context a freshwater pond adjacent to N.S.Science and Arts College, Bhadrawati having a diverse weed fauna is investigated with respect to its changing biodiversity of weeds during a two year span.

The weed fauna of this small pond is represented by 18 different species which is greatly responsible for shrinking its basin due to its enriched status. The enrichment of water of its basin is increased over years due to anthropogenic activities prevailing in its catchment area as well as death and decay of the weeds itself.

The studies confirm the degrading status of the pond which is slowly dying its death due to negligent activities of man. Sooner or later this small pond will be vanished forever with its weed fauna from the map of Bhadrawati town and urgent measures are needed to restore its shrinking area.

KEYWORDS: Aquatic weeds, Anthropogenic activities, Bhadrawati town, Biodiversity, Freshwater pond.

INTRODUCTION

Aquatic weeds always thrive in places of marshy lands and water logged areas of the world. In each and every water body, whether it is small or large, a variety of weeds thrive and develop. The weed biodiversity of every water body changes continuously based on nutrient supply seasonally and depending upon climatic conditions of the region during the process of succession.

The aquatic weeds are unwanted vegetation which grow in ponds and lakes and hamper its use (Sushilkumar, 2011). Out of 160 aquatic weeds *Ipomoea aquatica*, *Typha angustata*, *Eichhornia crassipes*, *Nelumbo nucifera*, *Alternanthera philoxeroides*, *Vallisneria spiralis*, *Chara*, *Potamogeton*, *Hydrilla*, *Ceratophyllum* and *Salvinia* are spread in Indian water bodies to a very large extent that they are an ecological threat to the regions under which they are thriving. The aquatic weeds are also termed as macrophytes of the water body due to their large visible size. These macrophytes are broadly classified as terrestrial as well as aquatic. The aquatic weed varieties are broadly classified as free floating, submerged, rooted floating, emergent and bank weeds.

Based on continuous nutrient loading to the water body from the catchment area and from anthropogenic input the process of succession converts the water body into dry land sooner or later completely. If the basin is shallow and water loss is fast through evapo transpiration the death and decay of macrophytes is very fast and the process of succession is rapid and the water body will be converted into dry land based on climatic conditions and surrounding topography. The submerged portions of the aquatic weeds provide habitat for many micro and macro invertebrates. These invertebrates are used as food by larger aquatic organisms including fish. After death of aquatic weeds their decomposition by bacteria and fungi provide food to the detritivores enriching the basin..

The study of submerged and floating vegetation is of great importance today as far as food supply to fish species is concerned. The aquatic weeds constitute an integral part of aquatic ecosystems of the world. They serve as a potential source of energy (Majid, 1986) and harbor a large amount of fauna. The macrophytes of different water bodies are studied by researchers like Haller (1978), Holm et al (1991), Jayanth and Visalakshi (1989), Cook (1996), Ambasht (2005), Raut and Pejaver (2005), Gupta (2008), Kiran *et. al.*, (2006), Sitre (2013).

Adjacent to Nilkanthrao Shinde Science and Arts College, Bhadrawati in Chandrapur District of Maharashtra State a small freshwater pond is situated having a beautiful flora of aquatic weeds. As there are no previous studies reported on weed flora of this small freshwater pond the present research work was an attempt made to study them.

MATERIALS AND METHODS

A small water logged freshwater pond situated adjacent to Nilkanthrao Shinde Science and Arts College, Bhadrawati is surveyed quarterly to assess the changing weed fauna for a period of two successive years. i. e. during June 2011- June 2013. This pond has an area of approx. 2 acres in the monsoon season with water level of about 5 feet depth. The aquatic weeds of this pond were collected by hand picking and also with the help of local fishermen. The collected weeds were then brought to laboratory and identified using standard available literature on weeds (Cook, 1996). Visual observations about topographic changes in the water level of pond and its surface were also recorded to assess the extent of changes in the pond basin for the period June 2011 to June 2013.

RESULT AND DISCUSSION

The aquatic weeds of the freshwater pond under investigation are presented in Table No.1 which depicts the weed flora of two consecutive years of the pond. In all 18 different weed species were recorded during a two year span study of this small pond situated besides our college campus. The weeds are categorized into 5 different types such as free floating, submerged, emergent, bank and rooted floating. During the first year of the study 3 different category of weeds are recorded with a large part encroached upon by the weeds of the pond. The second year flora is

represented by addition of emergent and bank weeds which encroach upon the banks of the pond covering its entire boundary.

It has been recorded that during 1st year of study about 60% of the pond area is covered by free floating weeds like *azolla pinnata*, *pistia stratiotes*, and *salvinia molesta* and about 9 different weeds are recorded. The first encroaching weeds of the basin are *azolla pinnata* and thereafter *pistia stratiotes* and *salvinia molesta*.

The death of these free floating weeds gave way to second batch of weeds termed as submerged weeds and thereafter emergent weeds. The last recorded weeds are the bank weeds (Table 1) which fully encroached the banks in second year and completely shallowed down the basin of the beautiful freshwater pond. The second year weed flora of the lake has about 16 different weeds.

The cycle of continuous death and decay and addition of nutrient laden wastewaters and open defecation practices prevalent on the banks are fully responsible for the degradation of this pond. The major contributory factor is the anthropogenic activities which has degraded the pond completely. Similar to our observations Kiran et al (2006) recorded 15 species of macrophytes belonging to 13 families and grouped them under submerged (2 species), rooted floating (2 species), free floating (2 species), Emergent (7 species) and marshy amphibious (2 species) from fish culture ponds of Karnataka. Meshram (2003) also recorded dominant macrophytes like *Hydrilla*, *Ceratophyllum* and *Chara* in Wadali lake of Amravati district and stated that the macrophytes stimulate the growth of phytoplankton and help in the recycling of the organic matter in the lake basin. Sugunan (1989) stated that aquatic macrophytes figure prominently in the community structure and trophic events of the reservoirs in India, and are the factors for ageing of reservoirs and pollution impact. Similar trend has occurred in the present pond completely degrading it within a span of two years.

So the present studies clearly show that anthropogenic impact on the pond ecosystem is responsible for its complete degradation and destroying its beautiful weed fauna and if urgent restorative measures like desilting are not taken into consideration it will be lost forever for the human utility.

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Table 1
The Bio-Diversity of Weed fauna of a Small Perennial Pond in
Bhadrawati Tehsil of Chandrapur District During Two Year Span

Sr.No.	Name of Weed	Ist Year Appearance In Pond	IInd Year Appearance In Pond
1.	Free Floating Weeds		
	<i>Azolla pinnata</i>	+	+
	<i>Pistia stratiotes</i>	+	+
	<i>Salvinia molesta</i>	+	+
	<i>Lemna minor</i>	+	-
	<i>Wolffia spp.</i>	+	-
2.	Rooted Floting Weeds		
	<i>Hydrilla verticillata</i>	+	+
	<i>Nymphaea</i>	-	+
3.	Submerged Weeds		
	<i>Potamogeton pectinatus</i>	-	+
	<i>Ceratophyllum demersum</i>	+	+
	<i>Vallisneria spiralis</i>	+	+
	<i>Myriophyllum spp.</i>	+	+
4.	Emergent Weeds		
	<i>Ipomoea aquatica</i>	-	+
	<i>Sagittaria spp.</i>	-	+
5.	Bank Weeds		
	<i>Ipomoea indica</i>	-	+
=	<i>Typha angustata</i>	-	+
	<i>Alternanthera philoxeroides</i>	-	+
	<i>Polygonum spp.</i>	-	+
	<i>Marselia spp.</i>	-	+
	Total Recorded Weeds in Two Different Years	09	16