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## Aquatic macrophytic diversity in unused fish culture ponds at Bhadra Reservoir project, Karnataka, India

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### Abstract

In the current study, a total of 07 species of aquatic macrophytes belonging to five genera and five families were recorded from unused fish culture ponds at Bhadra Reservoir Project, Karnataka during January to December 2009. These macrophytes play an important role in maintaining ecological balance and helps in maintaining primary productivity of the aquatic ecosystem. They provide habitat for birds and aquatic fauna. It indicates that, aquatic macrophyte species are specific to the environmental quality.

**Keywords:** Aquatic macrophytes, Fish culture ponds, Bhadra fish farm, Bhadra reservoir Project

### 1. Introduction

Fish ponds are controlled ones and are used to rear fish seeds and also to stock brood fishes. A fish pond provided an elegant solution and there was a flow of channel water into the ponds. Supplementary feeding and fertilization to enhance the growth of fishes. Nutrient levels and water quality in ponds can be controlled through natural process such as algal growth, or through artificial filtration<sup>[1]</sup>.

Aquatic plants constitute an important component of an aquatic ecosystem. Macrophytes though providing a food and shelter for aquatic animals may also increase diurnal variability of ecologically important physicochemical variables and inhibit mixing process that might improve habitat quality<sup>[2, 3, 17]</sup>. Abubakar<sup>[4]</sup> opined that aquatic macrophytes when present in large abundance have the power of modifying the composition, abundance and distribution of other aquatic organisms.

Aquatic plants serve as a source of food to the water birds and animals, thus forming a base for aquatic wildlife conservation practices. Macrophytes of different water bodies in India are studied by researchers such as Sugunan<sup>[5]</sup>, Yadav and Sardesai<sup>[6]</sup>, Ambasht<sup>[7]</sup>, Raut and Pejavar<sup>[8]</sup>, Patil *et al.*<sup>[9]</sup>, Sitre<sup>[10]</sup>, Sitre *et al.*<sup>[11]</sup>. As there is no earlier study on the aquatic macrophytic diversity of unused fish culture Ponds in Bhadra fish Seed farm of Shimoga district, Karnataka hence, an attempt has been made to study them.

### 2. Materials and Methods

#### Study Area

Unused fish culture ponds of Bhadra Reservoir Project, Karnataka are located 3Kms away from Kuvempu University, Shankaraghatta, in Shimoga district of Bhadravathi taluk in Western parts of Karnataka with Latitude- 13° 42'.00" N, and Longitude- 75° 38'.20" E. These ponds receives seepage water as well as Bhadra left the bank channel water. The area of each pond is about 800 m<sup>2</sup> with a depth of 5 feet (Table 1).The aquatic macrophytes were collected for the period of one year from January to December 2009. Harvest method was employed by using 1x1 mt quadrates in two unused fish ponds of Bhadra fish seed farm. The specimens were identified up to species level as per the guidelines of Kodarkar<sup>[12]</sup>, Singh and Karthikeyan<sup>[13]</sup>, Biswas and Calder<sup>[14]</sup>.

**Table 1:** Details of Fish culture ponds

	Pond I	Pond II
Area (m <sup>2</sup> )	800	800
Depth (Ft)	5	5
Type of pond	Earthen	Earthen
Pond shape	Rectangular	Rectangular

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### 3. Result and Discussion

In the present study altogether 07 species representing 5 families belonging to 2 groups such as, 5 Emergent and 2 Marshy amphibious macrophytes were recorded. The data is

tabulated in Table 2. Emergent aquatic macrophytes are defined as plants that are rooted in shallow water with vegetative parts emerging above the water surface.

**Table 2:** Species composition of Aquatic plants in two unused fish ponds at Bhadra fish seed farm, Bhadra Reservoir Project, Karnataka

Type of Species	Name	Family	Order	Pond I	Pond II
Emergent	<i>Cyperus sp</i>	Cyperaceae	Poales	-	+
	<i>Jussiaea repens</i>	Onagraceae	Myrtales	+	+
	<i>Jussiaea suffruticosa</i>	Onagraceae	Myrtales	+	-
	<i>Typha latifolia</i>	Typhaceae	Poales	+	+
	<i>Typha angustifolia</i>	Typhaceae	Poales	+	+
Marshy Amphibious	<i>Monocharia vaginalis</i>	Pontederiaceae	Commelinales	+	+
	<i>Grass sp</i>	Poaceae	Poales	+	+

Aquatic vascular plants are an important indicator of water pollution [15, 16, 17]. Aquatic plants are important as they serve as a substratum to different micro and macro fauna [8]. Aquatic weeds have been observed in seepage areas, depressions containing water along ponds, tanks and shallow depths of water bodies [18].

Majority of the plants found in fish ponds are of emergent in nature. In the present study, the important genera belongs are *Typha*, *Cyperus*, *Monocharia* etc. Some of the important macrophytes species observed are *Typha angustifolia*, *T.latifolia* and *Monocharia vaginallis*.

Ambasht [7] recorded 25 species of macrophytes from Gujrat Tal, Jaunpur townshio North India. Kiran *et al.* [19] 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. Game and Salaskar [20] recorded the macrophytes on Malchmali lakes, Thane, Maharashtra. Saltanat Malik and Atul Namdeo [21] recorded the 21 species of macrophytes in a polluted pond of Shahjanpur, U.P., Palit and Mukharjee [22] recorded 25 species of macrophytes in wetlands of Bankara district, West Bengal and Harney *et al.*, [23] reported 19 species of macrophytes in three water bodies of Bhadrawati of Chandrapur District. Sitre [10] recorded 17 macrophytes species in the Ghotnimbala reservoir of Bhadrawati tehsil in Chandrapur district. The present study confirms the presence of 07 different species of aquatic macrophytes in the unused fish ponds at Bhadra Project, Karnataka.



**Fig 1:** Views of Unused Fish culture Ponds showing dense growth of Aquatic macrophytes

### 4. Conclusion

Due to enriched fish feeds and manures increasing its organic load, thus providing a rich base for continuous growth of semi-aquatic and emergent macrophytes in the fish culture ponds. The results showed that the fish ponds are water logged with a dense growth of particular aquatic weeds which were posing a threat of silting and losing its aesthetic value due to prolific growth of aquatic weeds.

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