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A Floristic Study of Aquatic and Wetland Plants of Lal Nalla Dam of Samadrapur Tehsil, District Wardha, Maharashtra

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Abstract: *The floristic diversity studywas carried out at Lal Nalla Dam. It was constructed on the Lal Nalla River, the nearest city to the dam is Samudrapur in Wardha District of Maharashtra. Extensive and repeated field surveys were carried out from January 2020 to December 2021 in the study area, covering all the seasons of the year to document the species richness of the wetland. The three sites were selected from where a comprehensive list of aquatic and wetland plants occurring in the study areais prepared. During field surveys, emphasis was given to document the type of vegetation, growth form, and associated species. Morphological characters were recorded based on fresh material in the field. The open water zone of the lake has less growth of submerged and free-floating plants. The Marginal shallow zone with a depth of 30-40 cm is inhibited by the floating-leaved-like and emergent plants. In the study area total of 41 species were investigated from three major habitats as open-water zone, marginal shallow zone, and seasonal puddles were studied and according to the sites, the growth formlike one floating-leaved,five submerged plants, twenty-nine emergent, and six other plants was identified belonging to 22 different families in which Cyperaceae was a dominant family with 6 species. The study area shows species diversity but because of seasonal water level change and grazing by domestic livestock the disturbance is seen in vegetation.*

Keywords: Floristic diversity, Lal Nalla Dam, Wetlands, Emergent plants

I. INTRODUCTION

Wetland plants are found throughout the world, in swamps and marshes, in peatlands, billabongs, and sloughs, at the margins of lakes, streams, and rivers, in bays and estuaries, and along protected oceanic shorelines. In short, they are found wherever there are wetlands and they are often the most conspicuous component of the ecosystem (Cronk JK. et al.2001). From a biological standpoint, wetland plants have multiple roles in the functioning of wetlands. Like all photosynthetic organisms, they are crucial in fixing the energy that powers all other components of the system. They supply oxygen to other biota and contribute to the physical habitat. They are also a great water purifier by absorbing excess nutrients, sediment, and other pollutants before reaching rivers, lakes, and other water bodies. According to National Wetland Atlas: Maharashtra (2010), Wetlands directly or indirectly have enormous ecological, economic, commercial, and socio-economic importance and values(Anonymous 2010).

Although wetland plants are defined by their ability to inhibit wet places, they represent a diverse assemblage of species with different adaptations, ecological tolerances, and life strategies that enable their survival in saturated or flooded soils(Cronk JK. et al. 2001). According to Mitsch and Gosselink (1986), the wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface of the land is covered by shallow water. Wetland plants are interesting not only because they help us identify the boundaries of a wetland, but also because of their unique evolutionary strategies for coping with life in a saturated environment.

However aquatic plants (vascular) were defined by Cook 1996 as those Pteridophytes and Spermatophytes whose photosynthetically active parts are permanently or semi-permanently submerged in water or float on the surface. Both Wetland and Aquatic plants are important components of wetlands. (Cronk JK. et al. 2001)

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In India, the wetlands are increasingly facing several anthropogenic pressures, due to the rapidly expanding human population, large-scale changes in land use/land cover and burgeoning development projects, and improper use of watersheds have all caused a substantial decline of wetland resources of the country. The wetland ecosystem in India constitutes an integral part of the cultural and biodiversity landscape.

So the documentation of the Wetland and Aquatic plant's floristic diversity of any region is of immense importance to utilize and conserve the resources as well as to protect the interests of the society and nation at large. (NBAP, 2008)

Hence the following work was carried out to monitor the Aquatic and Wetland flora as the Wardha district is dominated by manmade wetland types and the reservoir/barrages occupy 44.84 % areas, followedby ponds and tanks (Anonymous, 2010).

II. MATERIAL AND METHODS

Study area- Lal Nalla Irrigation Project, Dam's Official Designation is **"Lal Nalla D-03118"**. Lal Nalla Dam was constructed as part of irrigation projects by the Government of Maharashtra in the year 2006. It is built on the Lal Nalla River, the nearest city to the dam is Samudrapur in Wardha District of Maharashtra. The dam is an Earth fill Dam. The length of the dam is 3450 m (11318.9 ft), while the height of the dam above the lowest foundation is 13.9 m (45.603 feet). The project has a spillway of Ogee type (i.e., the shape of the downstream face of the weir). The length of the spillway is 120 m (393.701 ft). The Dam has 5 Radial Types of spillway gates. It has a catchment area of 10.774 thousand hectares. The maximum / Gross storage capacity is 28.1 MCM. Live storage capacity is 26.13 MCM. (velusr.blogspot.com/2013).

Data Collection -Extensive and repeated field surveys were carried out from January 2020 to December 2021 in the study area, covering all the seasons of the year to document the species diversity of the wetland in the study area. The three sites were selected from where a comprehensive list of aquatic and wetland plants occurring in wetlands in the area under study is prepared. During field surveys, emphasis was given to document the type of vegetation, growth form, and associated species if any. Morphological characters were recorded based on fresh material in the field.

Laboratory Studies- All the herbarium specimens were carefully checked in the laboratory. The aquatic and wetland plants were identified and confirmed with help of the floras (Cook, CDK. 1996, Karthikeyan S. 1982, Mitsch WI & Gosselink IG. 1986, Sharma BD, Kartikeyan S & Singh NP. 1996, Singh NP, Lakshminarsimhan P &Kartiyeyan S. 2000., Singh NP, Lakshminarsimhan P, Kartiyeyan S & Prasanna PV. 2001., Ugemuge NR. 1986) and published literature in scientific journals. Doubtful specimens were checked and confirmed by comparing them with earlier identified specimens.

Observation

The floristic diversity studied in the following work was grouped in four categories as the aquatic and wetland plants in the study area were grouped according to Sculthorpe 1967, who adopted the simplest scheme to categorize the aquatic and wetland plants. The fifth growth form i.e., Other plant was added to study the vegetation near the study area.

Growth form

1. Floating
2. Floating-leaved
3. Submerged
4. Emergent
5. Other

FIG. 1. Aquatic and Wetland Plants list with Family and Growth form.

Sr.No.	Name	Family	Group
1	*Potamogetonnodosus* Poir.	Potamogetonaceae	Floating – leaved
2	*Vallisneria spiralis* L.	Hydrophyllaceae	Submerged
3	*Rotala indica* (Willd.) Koehne	Lythraceae	Submerged
4	Rotalamexicana	Lythraceae	Submerged
5	*Nechamandra alternifolia*(Roxb. ex Wight)	Hydrocharitaceae	Submerged

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6	*Hydrilla verticillate* (L.f.) Royle	Hydrocharitaceae	Submerged
7	*Heliotropiumcurassavicum* L.	Boraginaceae	Emergent plant
8	*Phyla nodiflora*(L.) Greene	Verbenaceae	Emergent plant
9	*Rotalaserpyllifolia* (Roth) Bremek	Lythraceae	Emergent plant
10	*Typha angustifolia*L.	Typhaceae	Emergent plant
11	*Medicago minima* L.	Fabaceae	Other plant
12	*Cyperus diformis* L.	Cyperaceae	Emergent plant
13	*Ipomea fistulosa*Mart. ex Choisy	Convolvulaceae	Emergent plant
14	*Cyathocline purpurea* Kuntze	Asteraceae	Emergent plant
15	*Centipeda minima* (L.)	Asteraceae	Emergent plant
16	*Grangeamaderaspatana* (l.) poir	Asteraceae	Emergent plant
17	*Spilanthes calva*DC.	Asteraceae	Emergent plant
18	*Coldenia procumbens* L.	Boraginaceae	Emergent plant
19	*Merremiagangetica* (L.)	Convolvulaceae	Emergent plant
20	*Cyperus amabilis* Vahl.	Cyperaceae	Emergent plant
21	*Cyperus involucratus*Rottb.	Cyperaceae	Emergent plant
22	*Cyperus iria* L.	Cyperaceae	Emergent plant
23	*Cyperus pygmaeus*Rottb.	Cyperaceae	Emergent plant
24	*Hoppeadichotoma* Willd.	Gentianaceae	Emergent plant
25	*Argemone 72iliate72* Linn.	Papaveraceae	Other plant
26	*Bacopa monnieri* (L.)	Scrophulariaceae	Emergent plant
27	*Ammanniabaccifera*L.	Lythraceae	Emergent plant
28	*Lindernia72iliate* (Colsm.)	Scrophulariaceae	Emergent plant
29	*Saccharum officinarum* L.	Poaceae	Emergent plant
30	*Alternanthera sessilis* (L.) DC.	Amaranthaceae	Emergent plant
31	*Anagallis arvensis* L.	Primulaceae	Other plant
32	*Hygrophilaschulli*(Buch. Ham.)	Acanthaceae	Emergent plant
33	*Caesulia axillaris*Roxb.	Asteraceae	Emergent plant
34	*Bergiaammannioides*Roxb.	Elatinaceae	Emergent plant
35	*Paspalidiumflavidum* (Retz.)	Poaceae	Emergent plant
36	*Polygonum plebeium* R.Br.	Polygonaceae	Emergent plant
37	*Corchorus aestuans*L.	Tiliaceae	Other plant
38	*Cynadondactylon*(L.)Pers.	Poaceae	Other plant
39	*Eleocharis dulcis* (Burm.f.)	Cyperaceae	Emergent plant
40	*Boerhaviaerecta*L.	Nyctaginaceae	Other plant
41	*Paspalum conjugatum* Berg.	Poaceae	Emergent plant

III. RESULT AND DISCUSSION

The Lal Nalla dam exhibits three major habitats as open-water zone, marginal shallow zone, and seasonal puddles. The open water zone of the lake has less growth of submerged and free-floating plants. The Marginal shallow zone with a depth of 30-40 cm is inhibited by the floating-leaved like and emergent plants like *Ipomea, Hydrilla, Alternanthera,* and others. In the seasonal puddles the emergent plants like *Rotalaserpilifolia, Polygonumplebium* were prominently seen.

The Aquatic and Wetlands plant studied in the study area were noted according to the growth form as floating plants were not seen as the area near the dam is leased out to local fishermen which earns them a good revenue, and sewage and garbage are not being released into the study area, agricultural runoff is also less so the invasive species were not seen. But in some sites the floating leaved plant vegetation was seen asthe plant *Potamogetonnodosus Poir.* (Potamogetonaceae) was seen prominently in the study area. The submerged five plants like *Vallisneria spiralis*

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(Hydrophyllaceae), *Rotala indica*, *Rotalamexicana* (Lythraceae), *Nachamandra alternifolia, Hydrilla verticillate* (Hydrocharitaceae) was noted. The Emergent twenty-nine plants like *Ipomea fistulosa* (Convolvulaceae), *Cyathocline purpurea* (Asteraceae), *Ammanniabaccifera*, *Rotalaserpyllifolia (*Lythraceae), etc were noted but mainly the emergent plant-like*Cyperus*, *Typha,*etc richness was not seen as domestic livestock are being grazed in the surrounding areas and the pronounced seasonal changes in water level also does not support extensive areas for growth form vegetation.

IV. CONCLUSION

In the study area total of 41 species were investigated. Inthree major habitats as open-water zone, marginal shallow zone, and seasonal puddles were studied and according to the study area, the growth formlike one floating-leaved, five submerged plants,twenty-nine emergent, and six other plants was identified belonging to 22 different families like Boraginaceae (2), Verbenaceae (1), Lythraceae (4), Potamogetonaceae (1), Hydrophyllaceae (1), Typhaceae (1), Fabaceae (1), Cyperaceae (6), Convolvulaceae (2), Asteraceae (5), Poaceae (4), Gentianaceae(1), Papaveraceae (1), Hydrocharitaceae (2), Scrophulariaceae (2), Amaranthaceae (1), Primulaceae (1), Acanthaceae (1),Elatinaceae (1), Polygonaceae (1), Tiliaceae (1), Nyctaginaceae (1). The study area shows species diversity but because of seasonal water level changes and grazing by domestic livestock the disturbance is seen in vegetation. Nowadays almost all the water bodies make for good picnic spots. Lal Nalla dam area is also a popular Tourist attraction for its scenic beauty.

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