



## Study of Aquatic Macrophyte Diversity of Sakharwahi Reservoir of Sakharwahi Village, Chandrapur District (Maharashtra), India

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### Abstract :

The aquatic plants those are grown in or near water are called as macrophytes. The macrophytes are of three types floating, submergent and emergent. The present investigation of aquatic macrophytes of sakharwahi reservoir of Chandrapur district showed 32 aquatic macrophyte species from 24 different families and 27 different genera. Depending upon the life form, the macrophytes are classified into 4 different groups as free floating macrophytes, rooted (anchored) floating macrophytes, submerged macrophytes and emergent macrophytes. In present study, emergent group recorded 17 species which is ascendant group over algae as well as pteridophytes. Four species of family hydrocharitaceae are recorded; therefore it is ascendant family among all 24 families, seems from the study. In submerged group, 8 species of macrophytes were recorded, floating macrophytes recorded 4 species, anchored or rooted floating and 3 species of free floating. Macrophytic investigation is significant to know the biodiversity of the area and simultaneously helps in maintenance of balance of ecosystem.

The present investigation of aquatic macrophytes of Sakharwahi reservoir, District Chandrapur (M.S.) India was carried out during the period, Feb 2015 to Jan 2016.

**Keywords :** Aquatic macrophytes, Biodiversity, Sakharwahi reservoir, Chandrapur district, Ecosystem.

### Introduction :

Macrophytes are of great importance as they act as direct source of food for fish and other aquatic organisms and wildlife. They also provide shelter for various species. Macrophytes in reservoir decrease the aquatic turbidity by dislodging sediments of reservoir, abolishing excess nutrients and decreasing the exuberance of phytoplankton. If macrophytes are not grown in lake especially if the lake is shallow, it means the environment with filthy water and unwanted fish species.

Different factors are responsible for proper growth and distribution of macrophyte in the reservoir, rivers, etc such as transparency, nutrient concentration and land. They were found to play role in macrophyte distribution and abundance (Bini et al., 1999, Akasaka et al., 2010) Physical and chemical characteristics of sediment plays important role in macrophyte distribution (Misra, 1938).

Macrophytes are classified into 4 classes named as free floating, floating leaved, submerged and emergent on the basis of their life forms (Sculthorpe, 1985) Aquatic macrophyte form connects between sediment, atmosphere and water in different aquatic ecosystems like lakes, rivers and reservoirs.

Many researchers carried out study on aquatic macrophytes from India and Maharashtra (Subramanyam, 1962, Bhaskar and Razi, 1973; Cook, 1996; Dutta et al, 2002; Dhore et al 2012; and many more researchers studied on aquatic macrophyte from Chandrapur district too for

which includes (Khinchi et al., 2008, Wadhare et al, 2010, Harney et al., 2013, Sitre, 2013, Sitre et al., 2014, Harney, 2014. Deshmukh et al., 2016a, 2016b, Shende et al, 2016 and Reddy and Chaturvedi, 2016).

Mahajan and Harney (2016a, 2016b and 2016c) reported 56 species of birds; they studied the diversity of rotifers and also reported the diversity of chlorophyceae from Mohabala Lake, Research work on aquatic macrophytes was not carried out on Sakharwahi reservoir of Chandrapur tahsil, so the present investigation was undertaken to know the condition of present species, their occurrence, distribution and biodiversity of aquatic macrophytes of Sakharwahi reservoir.

### Material and Methods :

**Study area:-** Sakharwahi reservoir in sakharwahi village, Chandrapur district is selected for the present study. It is located in northwest area of Chandrapur district situated on Chandrapur - Ghugus road. Sakharwahi reservoir is the oldest reservoir of Sakharwahi village. It is spread in 5.13 sq. km. of land.

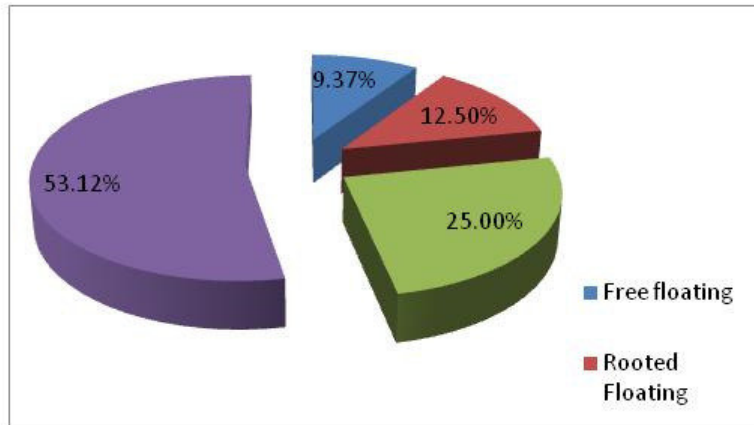
### Identification, Collection and Classification of Macrophytes :

The water samples from this reservoir was collected during the period of one year from Feb. 2015 to Jan. 2016 collection of specimen of aquatic macrophytic plants was done with the help of long handled hook then the specimen were washed, excessive water was soaked with filter paper, they were kept in polythene bag and brought to laboratory. By different laboratory processes herbarium of specimen was prepared.

All collected specimen were identified correctly using the literature and flora, Cook (1996), Gupta (2001), Yadav and Sardesai (2002), Kodarkar (1994). The selected specimen were classified on the basis of their habitat and their external characteristic.

**Table : Aquatic Macrophyte biodiversity of Sakharwahi Lake of Chandrapur District**

| Sr. No. | Botanical Name                            | Family Name      | Life Form         | Habbits     |
|---------|---|------------------|-------------------|-------------|
| 1       | <i>Aponogon nutans</i> L.                 | Aponogonaceae    | Anchored floating | Herb        |
| 2       | <i>Ipomoea aquatica</i> forsk             | Convolvulaceae   | Anchored floating | Herb        |
| 3       | <i>Nymphoides cristata</i> (Roxb) kuntz   | Menyantheaceae   | Anchored floating | Herb        |
| 4       | <i>Ludwigia adscendens</i> H. Hara        | Onagraceae       | Anchored floating | Herb        |
| 5       | <i>Pistia stratiotes</i> L.               | Araceae          | Free floating     | Herb        |
| 6       | <i>Lemna minor</i> L.                     | Lemnaceae        | Free floating     | Herb        |
| 7       | <i>Azolla Pinnata</i> R. Br.              | Salvinaceae      | Free floating     | Herb        |
| 8       | <i>Sagittaria obtusifolia</i> L.          | Alismataceae     | Emergent          | Herb        |
| 9       | <i>Sagittaria sagittifolia</i> I.         | Alismataceae     | Emergent          | Herb        |
| 10.     | <i>Xanthium strumarium</i> L.             | Asteraceae       | Emergent          | Herb        |
| 11.     | <i>Heliotropium supinum</i> L.            | Boraginaceae     | Emergent          | Herb        |
| 12      | <i>Commelina benghalensis</i> L.          | Commelinaceae    | Emergent          | Herb        |
| 13      | <i>Commelina hasskartii</i> C. comm. cyrt | Commelinaceae    | Emergent          | Herb        |
| 14      | <i>Aeschynomene indica</i> L.             | Fabaceae         | Emergent          | Under Shrub |
| 15      | <i>Aeschynomene aspera</i> L.             | Fabaceae         | Emergent          | Under Shrub |
| 16      | <i>Cyperus difformis</i> L.               | Cyperaceae       | Emergent          | Herb        |
| 17      | <i>Urena lobata</i> L.                    | Malvaceae        | Emergent          | Herb        |
| 18      | <i>Marsilea quadrifolia</i> L.            | Marsileaceae     | Emergent          | Herb        |
| 19      | <i>Ludwigia perennis</i> L.               | Onagraceae       | Emergent          | Herb        |
| 20      | <i>Oxalis corniculata</i> L.              | Oxalidaceae      | Emergent          | Herb        |
| 21      | <i>Cynodon dactylon</i> (L.) Pers         | Poaceae          | Emergent          | Herb        |
| 22      | <i>Polygonum glabrum</i> wild             | Polygonaceae     | Emergent          | Herb        |
| 23      | <i>Trianthema portulacastrum</i> Linn.    | Portulacaceae    | Emergent          | Herb        |
| 24      | <i>Typha angustata</i> Bory and Chaub     | Typhaceae        | Emergent          | Herb        |
| 25      | <i>Ceratophyllum demersum</i> L.          | Ceratophyllaceae | Submerged         | Herb        |
| 26      | <i>Chara globularis</i> J.I. Thuiller     | Characeae        | Submerged         | Herb        |
| 27      | <i>Hydrilla verticillata</i> (L.F.) Royle | Hydrocharitaceae | Submerged         | Herb        |
| 28      | <i>Vallisneria spiralis</i> L.            | Hydrocharitaceae | Submerged         | Herb        |
| 29      | <i>Ottelia alismoides</i> (L.) Pers       | Hydrocharitaceae | Submerged         | Herb        |
| 30      | <i>Azolla caroliniana</i> L.              | Azollaceae       | Submerged         | Herb        |
| 31      | <i>Wolffia</i> spp.                       | Lemnaceae        | Submerged         | Herb        |
| 32      | <i>Najas minor</i> L.                     | Hydrocharitaceae | Submerged         | Herb        |



Graph Showing Life form of Aquatic Macrophytes diversity of Sakharwahi Reservoir of Chandrapur district

**SAKHARWAHI RESER VOIR SHOWING SAMPLING SITES**



**RESULT AND DISCUSSION :**

In the present survey study total 32 aquatic macrophyte species were noted from Sakharwahi reservoir belonging to 24 families and 27 genera. They are classified into various group as free floating, anchored floating, submerged and emergent (Table 1.1)

Free floating macrophytes are not anchored to the soil at the base of reservoir. Only 3 species are registered i.e. *Pistia stratiotes* L. (Araceae), *Azolla pinnata* R. Br. (Salviniaceae) and *Lemna minor* L. (Lemnaceae), (9.37%)

Rooted floating macrophytes are fixed to soil at the bottom. 4 species of rooted floating macrophytes were recorded as : *Aponogon nutans* L. (Aponogonaceae), *Ipomoea aquatica* forsk (Convolvulaceae); *Nymphoides cristata* (Roxb) Kuntz (Menyantheaceae), *Ludwigia adscendens* H. Hara (Onagraceae), which contributes 12.50% of total macrophytes.

Submerged macrophytes are grown and developed underneath the water surface. Total 8 species of this group were recorded, these are : *Ceratophyllum demersum* L. (Ceratophyllaceae), *Chara globularis* J. I. Thuiller (Characeae), *Hydrilla verticillata* (L.F.) Royle (Hydrocharitaceae), *Vallisneria spiralis* L. (Hydrocharitaceae), *Ottelia alismoides* (L.) Pers (Hydrocharitaceae) *Azolla caroliniana* L. (Azollaceae), *Wolffia* sp (Lemnaceae), *Najas minor* L. (Najadaceae), 25% of total macrophytes

Out of 32 aquatic macrophytes 17 species of them from different 14 families which were grown in shallow water and existed near wet environment. They are referred as emergent macrophytes. They are as follows.

*Sagittaria obtusifolia* L. (Alismataceae), *Sagittaria sagittifolia* L. (Alismataceae), *Xanthium Strumarium* L. (Asteraceae), *Heliotropium Supinum* L. (Boraginaceae), *Commelina benghalensis* L. (Commelinaceae), *Commelina hasskartii* C. comm. Cyrt. (Commelinaceae), *Aeschynomene indica* L. (Fabaceae) *Aeschynomene aspera* L. (Fabaceae), *Cyperus difformis* L. (Cyperaceae), *Urena lobata* L. (Malvaceae), *Marsilea quadrifolia* L. (Marsileaceae), *Ludwigia perennis* L. (Onagraceae), *Oxalis corniculata* L. (Oxalidaceae), *Cynodon dactylon* (L) pers (Poaceae), *Polygonum glabrum* wild (Polygonaceae), *Trianthema portulacastrum* Linn. (portulacaceae), *Typha angustata* Bory and Chaub (Typhaceae), 53.12%

From all the above experimental investigation, the study revealed the presiding or ascendant species as angiospermic macrophytic

species which accounted for 29 species out of 32 (90.62%) This was followed by pteridophyte which showed merely 2 species, (6.25%) and algae showed single species, *Chara globularis* (3.12%) in Sakharwahi reservoir. Out of 32 species of aquatic macrophytes 02 species are shrubs (6.25%) and 30 species are herbs (93.75%)

**Conclusion :**

In present survey, total 32 aquatic macrophytes were documented from Sakharwahi reservoir of Sakharwahi village, Chandrapur district belonging to different groups like angiosperm pteridophytes and algae. Aquatic macrophytes play a significant role as they serve as substratum, food to different micro and macrofauna (Raut and Pejawar, 2005).

Aquatic macrophytes play an important role in maintenance of aquatic ecosystem. They absorb dissolved nutrients, Nitrogen and phosphorus from polluted water, influence nutrient cycle specially nitrogen cycle. Thus the study of aquatic macrophyte give us worthy and valuable information and helps in the maintainance of healthy lake environment.

But every coin has two sides. If the macrophytes are present in surplus amount, they not only reduce the productivity by accumulation of silts but also produce excess amount of nutrients causing death and pollute water and add foul and filthy smell to water posing serious socioeconomic loss of water resources. Macrophytes being directly or indirectly related to aquatic ecosystem and environment, the present investigation is carried out to know the status of Sakharwahi reservoir in terms of aquatic macrophytes.

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