STM JOURNALS

Research & Reviews: Journal of
Botany

ISSN: 2278-2222
Volume 15, Issue 1, 2026
January–April
DOI (Journal): 10.37591/RRJoB

https://journals.stmjournals.com/rrjob

Research RRJoB

Preliminary Survey & Documentation of Wetland Macrophyte Diversity from Chargaon Lake in Warora Taluka, Dist. Chandrapur, Maharashtra, India

Mrunal Warhade[1,*], Pramesh Dani[2], Vasanta Kahalkar[3]

Abstract

Wetland macrophytes are most diverse group of aquatic macroscopic Angiosperms that has great ecological influence on wetland ecosystem, plays significant role in every food chain operated in aquatic ecosystem. Present study site has a total catchment area of 14.83 thousand hectors constructed in the year 1983 mainly for irrigation practices to nearby villages. The aim of present study is to conduct preliminary survey followed by proper documentation of floral diversity in & around Chargaon Lake located in Warora tehsil for a period of one year from February 2024 to January 2025. The overall work includes seasonal survey of Chargaon wetland at different sites, collection of macrophytes, documentation & identification of collected macrophytes with accepted names. A total of 55 wetland macrophytes belonging to 42 genera & 23 families were recorded. Among them, Cyperaceae are most dominant family represented by 10 species followed by Asteraceae & Hydrocharitaceae represented by 06 & 05 species each. Study site harbor a rich diversity of suspended hydrophytes in shallow marginal water while floating hydrophytes show almost negligible appearance. These findings highlight the ecological importance of Chargaon Lake as a supportive habitat for varied macrophyte communities that contribute to nutrient cycling, habitat complexity, and overall wetland productivity. The documentation generated through this year-long assessment will serve as a valuable baseline for future ecological monitoring, conservation planning, and sustainable wetland management initiatives.

Keywords: Wetland, macrophytes, chargaon, diversity, ecosystem

INTRODUCTION

Wetlands are transitional area in between terrestrial & aquatic ecosystem that indicates wetland neither entirely aquatic nor terrestrial. Wetlands are geologically young & ecologically very delicate ecosystem. The earth has 5.3 to 12.8 million km^2 of wetland area [1]. Globally wetlands are highly adaptive, productive & biologically rich ecosystem that provides many significant private & public services to society with both consumptive & non-consumptive benefits.

In India, wetland covered 4.63% land area including inland wetland accounted for 69%, coastal wetland for 27% & other wetland accounted for 4% [2]. The lotic freshwater water bodies are commonly known as 'Talav or Boli' in Vidarbha region of Maharashtra.

Wetland harbors large range of floral & faunal diversity, beside that it provide human

***Author for Correspondence**
Mrunal Warhade
E-mail: dani.pramesh@gmail.com

[1]Head & Assistant Professor, Department of Botany, Gramgeeta Mahavidyalaya, Chmiur, Chandrapur, Maharashtra, India
[2]Assistant Professor, Department of Botany, Shri Govindrao Munghate Arts & Science College, Kurkheda, Gadchiroli, Maharashtra, India
[3]Assistant Professor, Department of Botany, Mahatma Gandhi Arts, Science and Late N. P. Commerce College, Armori, Gadchiroli, Maharashtra, India

Received Date: April 22, 2025
Accepted Date: June 17, 2025
Published Date: July 29, 2025

Citation: Mrunal Warhade, Pramesh Dani, Vasanta Kahalkar. Preliminary Survey & Documentation of Wetland Macrophyte Diversity from Chargaon Lake in Warora Taluka, Dist. Chandrapur, Maharashtra, India. Research & Reviews: Journal of Botany. 2026; 15(1): 1–7p.

requirements through contribution to agriculture, fisheries, edible products, raw materials for industries & medicines [3]. It is estimated that freshwater wetlands alone support 20% of the known range of biodiversity in India [4].

Wetland provides an ideal habitat for the colonization of various macrophyte diversity which plays pivotal role in primary productivity of the wetland ecosystem across the world. Macrophytes are species of aquatic plants which normally stand in water and must grow for at least a part of their life cycle in water, either completely submerged or emerged Macrophytes are species of aquatic plants which normally stand in water and must grow for at least a part of their life cycle in water, either completely submerged or emerged Macrophytes are species of aquatic plants which normally stand in water and must grow for at least a part of their life cycle in water, either completely submerged or emerged Macrophytes are keystone aquatic plant species that thrive in water, spending at least part of their life cycle either fully submerged or partially emerged [5], encompass macro algae, certain ferns and angiosperms. Today, wetlands around the world are experiencing significant habitat loss due to a variety of human activities. Factors such as untreated sewage and garbage disposal, siltation from surface runoff and encroachment within marginal lake areas are major causes of shrinking of water bodies. These anthropogenic activities directly made the impact on the physical, chemical and biological processes of aquatic ecosystems, leading to a decline in biodiversity, a reduction in ecosystem services and a decrease in the economic value of such delicate habitats [6, 7].

The present investigation aims to visit and document macrophyte diversity in different seasons. Except for some faunal work and chemical parameters, no considerable studies have been carried out in the study site related to floral diversity. The present research may be considered baseline data for the researcher as the study site was found to be one of the attractive spots for migratory bird lovers of the Vidarbha region of Maharashtra.

METHODOLOGY

Study Site

Chandrapur, previously known as “Chanda” district located in the eastern part of Maharashtra state at 19.57°N latitude and 79.18°E longitude. The District known for its Tigers & Coal mines (Figure 1).

Figure 1. Map of Maharashtra highlighting Chandrapur district with aerial and ground view of Chargaon lake.

Chargaon Lake are one of the important lake situated in Warora taluka of Chandrapur district, popular among the peoples for its migratory bird diversity. This lake has a total catchment area of 14.83 thousand hectors constructed in the year 1983 mainly for irrigation practices to nearby villages [8].

The irrigation project started by government of Maharashtra situated on Chargaon River at Chargaon Bk. at coordinates in between 20.3944526°N and 79.1757202°E. The maximum gross storage capacity of reservoir is 21.7 MCM and live storage capacity is 19.866 MCM.

Present study site are bounded by agriculture fields at all sites & receive huge amount of agriculture sewage from surrounding crop fields.

As for literature available on the study site, a special emphasis was given to Avifaunal diversity where 196 Species of birds were documented belonging to 64 different families and 19 different orders of class Aves [2], ichthyo-faunal diversity, Fish diversity & Chemical parameter, done by the different workers on different times [9–12].

Regarding macrophyte diversity, no research work has been conducted so far. The present investigation aims to visit & document of macrophyte diversity across different seasons.

Floristic Survey & Data Collection

The overall research work was done through regular visits to random sites and seepage area of wetland from February 2024 to January 2025. The wetland floral diversity found in different sites of wetland was collected, photographed and identified with the floras.

The macrophyte species were classified into six subcategories based on their growth forms. These are free-floating (FF), floating but rooted FR), submerged but not rooted SNR), submerged but rooted (SR), amphibious macrophytes (AM) & emergent macrophytes (EM) prescribed by Pedralli methods in 1990 [13–15].

Identification of Wetland Flora

The collected and digitalized data of current research work were identified with the help of floras of [10, 16–19] and published regional literature in form of research articles in various journals. In present study, diversity of macrophytes is tabulated according to Bentham–Hooker classification system. With Botanical names in alphabetical order with flowering & fruiting season, growth forms & seasons of availability.

OBSERVATION

The observation table documents 55 macrophyte species belonging to 42 genera and 23 families, recorded across rainy, winter, and summer seasons. Cyperaceae emerged as the most dominant family, followed by Asteraceae and Hydrocharitaceae. The seasonal distribution highlights rich emergent and submerged vegetation, reflecting the ecological diversity of Chargaon Lake (Table 1).

Table 1. Floristic composition of macrophyte diversity of Chargaon Wetland.

S.N.	Scientific name	Family	Flow. & Frt. time	Growth form	Seasons		
					R	***W***	***S***
1.	*Aeschynomene aspera* L.	Fabaceae	Aug–Sep	EM	+	+	-
2.	*Aeschynomene indica* L.	Fabaceae	July–Dec	EM	+	+	-
3.	*Alternanthera sessilis* (L.) R. Br. ex DC.	Amaranthaceae	Jan–Dec	EM	+	+	+
4.	*Ammania baccifera L.*	Lythraceae	Dec–Mar	EM	+	+	-
5.	*Bergia ammannioides* Roxb.	Elatinaceae	Nov–Feb	EM	+	+	+
6.	*Blyxa aubertii Rich.*	Hydrocharitaceae	Aug–Feb	SR	-	+	-

7.	*Caesulia axillaris* Roxb.	Asteraceae	Sep–Feb	EM	+	+	+
8.	*Ceratophyllum demersum* L.	Ceratophyllaceae	Jan–April	SNR	+	+	+
9.	*Chara sp*.	Characeae	–	SNR	+	+	+
10.	*Coldenia procumbens* L.	Boraginaceae	June–July	EM	-	+	+
11.	*Commelina benghalensis* L.	Commelinaceae	June–Dec	AM	+	+	+
12.	*Commelina diffusa* Burm.	Commelinaceae	July–Feb	AM	+	+	+
13.	*Cyperus alulatus* Kern	Cyperaceae	July–Sep	EM	+	+	+
14.	*Cyperus difformis* L.	Cyperaceae	Aug–Jan	EM	+	+	+
15.	*Cyperus iria* L.	Cyperaceae	Aug–Jan	EM	+	+	+
16.	*Cyperus tenuispica* Stend.	Cyperaceae	Sep–Feb	EM	+	+	+
17.	*Echinochloa colona* (L.) Link.	Poaceae	July–Feb	EM	+	+	+
18.	*Eclipta prostrata* (L.) Mant.	Asteraceae	July–Feb	EM	+	+	+
19.	*Fimbristylis argentia* (Rottb.) Vahl.	Cyperaceae	Oct–Nov	EM	+	+	+
20.	*Fimbristylis dichotoma* (L.) Vahl.	Cyperaceae	June–Nov	EM	+	+	+
21.	*Fimbristylis miliace*a (L.) Vahl.	Cyperaceae	Oct–Nov	EM	+	+	+
22.	*Fimbristylis tetragona* R. Br. Prodr.	Cyperaceae	Sep–Nov	EM	+	+	+
23.	*Gnaphalium polycaulon* Pers.	Asteraceae	Dec–May	EM	+	+	+
24.	*Grangea maderaspatana* (L.) Poir	Asteraceae	Dec–May	EM	+	+	+
25.	*Hedyotis corymbosa* (L.) L. Mant	Rubiaceae	July–Feb	EM	+	+	+
26.	*Heliotropium indicum* L.	Boraginaceae	July–June	EM	+	+	+
27.	*Heliotropium ovalifolium* Forssk	Boraginaceae	June–Mar	EM	-	+	+
28.	*Hydrilla verticillata* (L. f.) Royle.	Hydrocharitaceae	Aug–Feb	SR	+	+	+
29.	*Hygrophila polysperma* (Roxb.)	Acanthaceae	Sep–Dec	EM	-	+	+
30.	*Hygrophila schulli* (Buch- Ham) Almeida	Acanthaceae	Nov–June	EM	+	+	+
31.	*Ipomoea carnea* Jacq. Austin	Convolvulaceae	Jan–Dec	EM	+	+	+
32.	*Lindernia rotundifolia* (L.) Mukherjee	Scrophulariaceae	Aug–Nov	AM	+	+	+
33.	*Ludwigia perennis* L.	Onagraceae	July–Aug	AM	+	+	+
34.	*Marsilea minuta* L. Mant.	Marsileaceae		AM	+	+	+
35.	*Murdannia nudiflora* (L.) Brenan.	Commelinaceae	July–Nov	AM	+	+	-
36.	*Najas graminea* Del.	Najadaceae	June–Oct	SR	-	+	+
37.	*Najas marina* L.	Najadaceae	–	SR	+	+	+
38.	*Nechamandra alternifolia* (Roxb. ex Wight) Thwaites	Hydrocharitaceae	Jan–Mar	SR	-	+	+
39.	*Nymphaea nouchali* Burm	Nymphaeaceae	Jan–Dec	FR	+	+	+
40.	*Oryza rufipogon* Griff.	Poaceae	Aug–Dec	EM	+	+	-
41.	*Ottelia alismoides* (L.) Pers.	Hydrocharitaceae	Sep–Apr	SR	+	+	+
42.	*Paspalum scrobiculatum* L.	Poaceae	Oct–Dec	EM	+	+	+
43.	*Phyla nodiflora* (L.) Greene	Verbenaceae	Aug–Dec	EM	+	+	+
44.	*Polygonum plebeium* R. Br.	Polygonaceae	Jan–Dec	EM	+	+	+
45.	Potamogeton pectinatus L.	Potamogetaceae	Jan–Mar	SR	-	+	+
46.	*Rotala indica (*Willd.) Koehne	Lythraceae	Nov–Feb	AM	+	+	+
47.	*Rotala verticillaris* L.	Lythraceae	Oct–Dec	EM	+	+	+
48.	*Schoenoplectus lateriflorus* (Gmel.) Lye.	Cyperaceae	Sep–Oct	AM	-	+	+
49.	*Schoenoplectus litoralis* (Schrad.) Palla	Cyperaceae	Dec–Jan	AM	+	+	+
50.	*Smithia conferta* Ait.	Fabaceae	Oct–Jan	EM	-	+	+
51.	*Sphaeranthus indicus* L.	Asteraceae	Nov–May	EM	+	+	+
52.	*Spilanthus calva* DC	Asteraceae	Sep–Jan	EM	+	+	+
53.	*Tonningia axillaris* (L.) O. Ktze.	Commelinaceae	July–Dec	AM	+	+	+
54.	*Vallisneria spiralis* L.	Hydrocharitaceae	Oct–Apr	SR	+	+	+
55.	*Vetiveria zizaniodes* (L.) Nash	Poaceae	Oct–Nov	EM	+	+	+

Abbreviation: FF – free-floating, FR – floating but rooted, SNR – submerged but not rooted, SR – submerged but rooted, AM -- amphibious macrophytes, EM – emergent macrophytes, R – Rainy, W – Winter, & S – Summer.

RESULT & DISCUSSION

It has been documented 55 macrophytes belonging to 42 genera & 23 families. Out of which 53 macrophyte species are Angiosperms, 01 are Pteridophytes while 01 are macroalgae. Among the total families, family cyperaceae are dominant families represented by 10 species, family Asteraceae represented by 06 species, family Hydrocharitaceae represented by 05 species while family Commelinaceae & Poaceae represented by 04 species each (Figures 2 and 3).

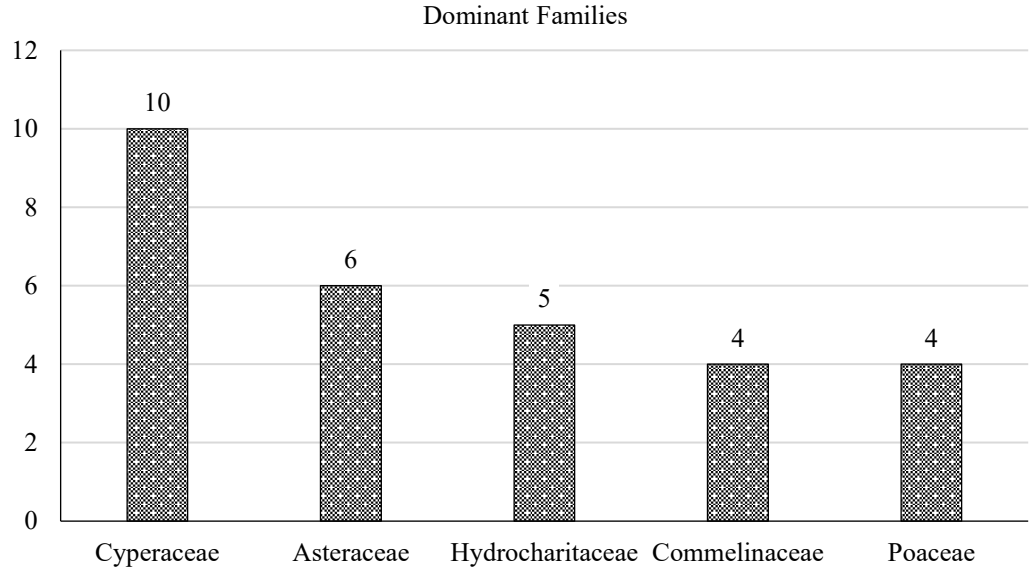

Figure 2. Dominant families.

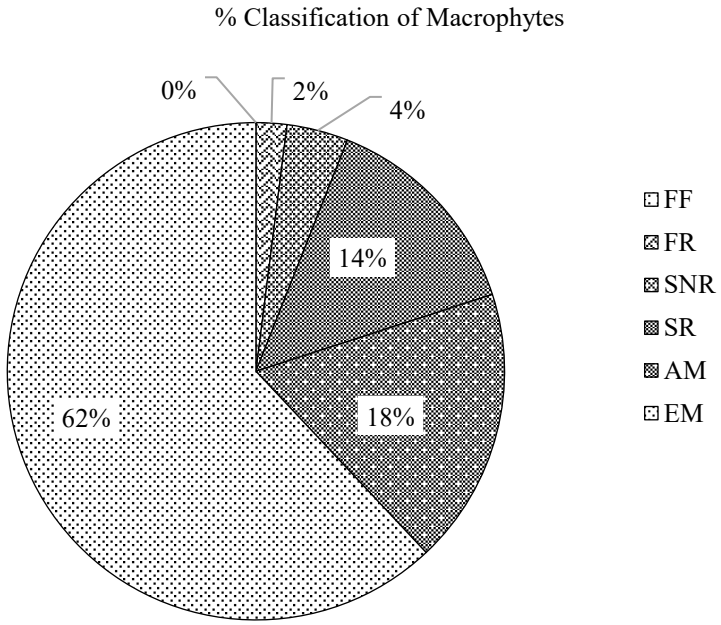

Figure 3. % Classification of macrophyte species based on growth forms.

During the current study, submerged vegetation was found to be most dominant growth form in shallow water. Free floating macrophytes were not recorded at all while rooted floating macrophyte show little appearance represented by only 01 species. Entire wetland fringed by agricultural fields in all sites where emergent macrophytes are most dominant growth forms covered 66% of total macrophyte diversity.

In present investigation, maximum diversity was seen in winter season followed by late rainy season. Chargaon wetland dominated by emergent macrophyte vegetation, mainly patches of Schoenoplectus litoralis species were observed at two sites.

Chargaon wetland was shrinking at alarming rate mainly due to regular encroachment of marginal area of wetland, were observed by the farmers during the winter. During the survey, a large avifaunal diversity was observed from study site that indicate its good ecological health & wealth.

CONCLUSION

Chargaon wetland harbors a rich diversity of suspended macrophytes in marginal region which provides one of the most important feeding grounds for more than 125 bird species & variety of fishes.

However during the present study it has been found that, due to anthropogenic activities like regular encroachment of agricultural land, untreated sewage disposal from crop fields & illegal poaching of birds inside & around the wetland gradually brings a process of degradation of the wetland flora & fauna has been started.

To ensure the sustainable conservation of this delicate wetland ecosystem, it's crucial to implement effective conservation measures without delay. This can be achieved through collaborative management efforts involving both local communities, government and non- government agencies.

REFERENCES

1. Ali M, Iqbal IM, Shabbir A, Khan Z. Ethnomedicinal studies on aquatic plants of tehsil. 2020;8(1):15–19.
2. Bawaskar KS, et al. Avifaunal diversity in and around Chargaon Dam (Warora) District Chandrapur (M.S.) India. Int J Life Sci. 2016;4(3):401–11.
3. Boyer T, Polasky S. Valuing urban wetlands: A review of non-market valuation studies. Wetlands. 2004;24(4):744–55.
4. Cantonati M, Poikane S, Pringle CM. Natural and artificial freshwater environment: Consequences for biodiversity conservation. Water. 2020;12:260.
5. Chadgulwar RS, Bakare SS. Ichthyofaunal diversity of the Chargaon lake near Warora, Dist. Chandrapur, MS, India. Int J Life Sci. 2020;8(3):593–6.
6. Cook CDK. Aquatic and wetland plants of India. London: Oxford University Press; 1996.
7. Deepa RS, Ramachandra TV. Impact of urbanization in the interconnectivity of wetlands. In: National Symposium on Remote Sensing Application for Natural Resources; 1999. Indian Society of Remote Sensing, Bangalore.
8. FAO. Aquatic plants: Their uses and risks. Rome: FAO; 2012.
9. Khobragade P, Wawre S. Current study of chemical parameters of Chargaon Lake in Warora Taluka of Chandrapur District, Maharashtra, India. J Emerg Technol Innov Res. 2024;11(8):505–8.
10. Mukherjee AK. Flora of Pachmarhi & Bori reserves. Kolkata: Botanical Survey of India; 1984.
11. Musenscher WC. Aquatic plants of the United States. New York: Comstock Publishing Co.; 1944.
12. Patel HA, Sahoo S, Thakor A. Diversity of aquatic macrophyte species of Pardi Wetland, Valsad District, Gujarat, India: Socio-economic and ethnobotanical importance. Curr World Environ. 2023;18(3):1325–36.
13. Pedralli G. Macrófitos aquáticos: Técnicas e métodos de estudos. Estud Biol. 1990;26:5–24.
14. Sharma BD, Lakshminarasimhan P. Flora of Maharashtra State: Monocotyledones. Kolkata: Botanical Survey of India; 1996.
15. Singh NP, Lakshminarsimhan P, Karthikeyan S, Prasanna PV. Flora of Maharashtra. Dicotyledones. Vol. 1 & 2. Kolkata: Botanical Survey of India; 2000–2001.

16. Subramanyam K. Aquatic angiosperms. Botanical Monograph No. 3. New Delhi: CSIR Publications; 1962.
17. Ugemuge NR. Flora of Nagpur District, Maharashtra. Nagpur: Shree Prakashan; 1986.
18. Waware S, Thaokar N, Dhamani A, Kamdi R. Comparative study of fish biodiversity at Chargaon lake in Warora taluka, Chandrapur district (M.S.) India. 2022;10(2):192–7.
19. Yadav SR, Sardesai MM. Flora of Kolhapur District. Kolhapur: Shivaji University Publication; 2002.

