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Studies on aquatic macrophytic diversity in ponds of Pakur

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Abstract:- The current study deals with the Aquatic Macrophytes of Pakur. The study conducted from the year 2017 to 2020 reveals the presence of total 68 species, these 68 species are distributed over 36 families and 53 genus. Out of that 13 families, 27 genera and 30 species belongs to monocotyledons whereas 20 family, 26 genus and 35 species belongs to dicotyledons. The algae with 1 family, 1 genus and 1 species & Pteridophyte with 2 family, 2 genera and 2 species.

Key words: Aquatic, Macrophytes, Pakur, Ponds.

INTRODUCTION

Pakur literally meaning Pokhar (Pokur in Bangla). Due to the presence of large number of Ponds (Pokhar) the district is called Pakur. However the other historical facts are different. A large number of Ponds are present in this district, being a Bengali dominating area the ponds are used for fishery activities. These ponds harbor a large number of Aquatic Plants (Aquatic macrophytes). Some of the ponds in the area are badly infested with these plants, hampering the fisheries activities as well as other effective uses of water. So far no any scientific studies on Macrophytes of the area has been done, this is the pioneer work on Aquatic Macrophytes.

It is evident that the aquatic plants are different from the terrestrial plant as it is very fragile and soon lose their characters as soon as taken out of the water. These aquatic plants help in the maintenance of the aquatic ecosystem.

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As far as flora of Jharkhand is concerned Botany of Bihar and Orissa (1921-1925) is a well documented flora, supplemented by Mooney (1950)[1], coming to aquatic flora is concerned some important workers are Christopher (2006)[2], Cook (1996)[3], Gupta (1979)[4], Jha (1965)[5], Kachroo (1959)[6], Maheshwari (1960)[7], Majumdar (1965)[8], Mukherjee (2001)[9], Mukherjee & Kumar (2003)[10], Mukherjee & Ghosh (2015)[11], Naskar (1990)[12], Subramanyam (1962)[13], Singh (1998)[14], Singh (1990)[15], Verma and Pandeya (2007)[16], Verma and Pandeya (2008)[17], Mukherjee and Kumar (2019)[18], Mukherjee and Kumar (2020)[19].

MATERIALS & METHOD

Study area

The district of Pakur came into existence in the year 1994. It is situated in the north east corner of Jharkhand State. It is located at 23°40' to 25°18' latitude and 86°25' to 87°57'E longitude. Pakur is the administrative headquarters

of this district. It is situated on the north-eastern corner of Jharkhand state. The district is bounded on the north by Sahebganj district, on the south by Dumka district, on the west by Godda district, and on the east by the Murshidabad district of West Bengal. Pakur district consists of 06 Blocks. The following are the list of the Blocks in Pakur district- Pakur, Maheshpur, Hiranpur, Littipara, Amrapara, Pakuria. The district, with a population of 899,200 (census 2011), and covering an area of 686.21 km², this gives it a ranking of 465th in India (out of a total of 640).

Fig. 1-Map of Jharkhand Showing Pakur District

METHODOLOGY

The Ponds of Pakur were visited in regular interval in every season intensively in order to report the number of aquatic Macrophytes. Considering the delicate nature of aquatic plants, extensive care was taken during removing them from water so that they might not lose their significant taxonomic characters. During field work, important characters like habit, colour, height and association of the plants with other plants were noted down. Plants were pressed in the field herbarium press. Some plants were also kept in dilute solution of formaldehyde. Just after returning from the field, the plants were studied in the laboratory on the very same day. The field numbers were verified, flowers were dissected and the plants were identified with available flora.

After proper identification, the plants were dried and pressed under wooden herbarium press. Prior to pressing, the specimen were poisoned in 2% solution of Mercuric Chloride in rectified spirit. The specimens after drying were mounted with the help of synthetic resin adhesive and thread on the herbarium sheets of standard size (41.6 x 29.5). The plants are listed as per the classification system of Bentham and Hooker (1862-1883). The specimens are deposited in the herbarium of Department of Botany, K.K.M. College, Pakur.

RESULT & DISCUSSION

A survey conducted in Pakur to know the Macrophytes of the area reveals the presence of total of 68 species, these 68 species are distributed over 36 families and 53 genus. Out of that 13 family 27 genera and 30 species belongs to monocotyledons whereas 20 family, 26 genus and 35 species belongs to dicotyledons. The algae with one family, 1 genus and 1 species and Pteridophyte with 2 family, 2 genera and 2 species.

Out of total reported 68 aquatic Macrophytes, the dominating taxa belongs to emergent Macrophytes contributing 57.35%, 39 species, then comes the submerged species, which contributes 16.17% having 11 species, followed by Rooted Macrophytes that contributes 14.70%, 10 species and finally the free floating species contributes 11.76%, 8 species.

The largest family is Cyperaceae having 5 species followed by Poaceae and Hydrocharitaceae with 4 species

each, Amaranthaceae, Lythraceae, Polygonaceae, Pontederiaceae, Polygonaceae, Potamogetonaceae and Araceae with 3 species each, Fabaceae, Aponogetonaceae, Commelinaceae, Convolvulaceae, Onagraceae, Nymphaceae and Menyanthaceae with two species each where as Plantaginaceae, Ceretophyllaceae, Apiaceae, Eriocaulaceae, Molluginaceae, Boraginaceae, Acanthaceae, Lemnaceae, Haloragaceae, Nelumbonaceae, Rubiaceae, Typhaceae, Verbenaceae and Portulacaceae with one species each beside Salvinaceae, characeae and Marsiliaceae have 1 species too. A list of all 68 plants has been given in Table -1.

Table 1- Aquatic Macrophytes from Pakur

S.N.	Name	Family	Dicot / Monocot	Habitat
1	*Azolla pinnata* R.Br.	Salvinaceae	Cryptogams	Free floating
2	*Aeschynomene aspera* L.	Fabaceae	D	Emergent
3	*Aeschynomene indica* L.	Fabaceae	D	Emergent
4	*Alternanthera philoxeroides* (Mart.) Griseb.	Amaranthaceae	D	Emergent
5	*Alternanthera sessilis* (L.)R. Br. ex	Amaranthaceae	D	Emergent
6	*Ammannia baccifera* L.	Lythraceae	D	Emergent
7	*Aponogeton undulatus* Roxb	Aponogetonaceae	M	Submerged
8	*Aponogeton natans* (L.) Engl. & K. Krause in Engl.,	Aponogetonaceae	M	Submerged
9	*Bacopa monnieri* (L.) Penell	Plantaginaceae	D	Emergent
10	*Ceratophyllum demersum* L.	Ceretophyllaceae	D	Free floating
11	*Chara globularis* J.L.Thuiller	Characeae	Cryptogams	Submerged
12	*Chenopodium murale* L.	Amaranthaceae	D	Emergent
13	*Coix lacryma -jobi*	Poaceae	M	Emergent
14	*Centella asiatica* (L.) Urb.	Apiaceae	D	Emergent
15	*Commelina benghalensis* L.	Commelinaceae	M	Emergent
16	*Commelina hasskarlii*	Commelinaceae	M	Emergent
17	*Cyperus rotundus* L.	Cyperaceae	M	Emergent
18	*Cyperus corymbosus* Rottb.	Cyperaceae	M	Emergent
19	*Cyperus iria* L.	Cyperaceae	M	Emergent
20	*Cyperus difformis* L.	Cyperaceae	M	Emergent
21	*Cynodon dactylon*	Poaceae	M	Emergent
22	*Eichhornia crassipes* (Mart.) Solms.	Pontederiaceae	M	Free floating
23	*Echinochloa colona*	Poaceae	M	Emergent
24	*Eclipta prostrata*	Asteraceae	D	Emergent
25	*Eleocharis dulcis* (Burm.F.)	Cyperaceae	M	Emergent
26	*Enydra fluctuans* DC.	Asteraceae	D	Emergent
27	*Eriocaulon cinerum*	Eriocaulaceae	M	Emergent
28	*Glinus lotoides* L.	Molluginaceae	D	Emergent
29	*Heliotropium indicum*	Boraginaceae	D	Emergent
30	*Hygrophila auriculata* (Schumach.) Heine	Acanthaceae	D	Emergent
31	*Hygrorhiza aristata* (Retz.) Nees ex Wight. & Arn.	Poaceae	M	Free floating
32	*Hydrilla verticillata* (L. f.) Royle	Hydrocharitaceae	M	Submerged
33	*Ipomoea aquatica* Forssk.	Covolvulaceae	D	Rooted floating
34	*Ipomoea carnea* Jacq.	Convolvulaceae	D	Emergent
35	*Ludwigia adscendens* (L.) H.Hara	Onagraceae	D	Rooted floating
36	*Ludwigia perennis* L.	Onagraceae	D	Rooted floating
37	*Lemna perpusilla* Torr.	Lemnaceae	M	Fee floating
38	*Marsilia minuta*	Marsiliaceae	Cryptogams	Emergent
39	*Myriophyllum tetrandrum* Roxb.,	Haloragaceae	D	Rooted floating
40	*Monochoria hastata* (L.) Solms	Pontederiaceae	M	Rooted floating
41	*Monochoria vaginalis* (Burm. f.) Presl.	Pontederiaceae	M	Rooted floating
42	*Nymphaea pubescens* Willd	Nymphaeaceae	D	Rooted floating
43	*Nymphaea rubra* Roxb. ex Andrews	Nymphaeaceae	D	Rooted floating
44	*Nelumbo nucifera* Gaertn.,	Nelumbonacae	D	Rooted floating
45	*Nymphoides hydrophylla* (Lour.) Kuntze	Menyanthaceae	D	Rooted floating
46	*Nymphoides indica* (L.) Kuntze	Menyanthaceae	D	Rooted floating
47	*Nechamandra alternifolia* Roxb. Ex Wight Thwaites	Hydrocharitaceae	M	Submerged
48	*Ottelia alismoides* (L.) Pers.	Hydrocharitaceae	M	Submerged
49	*Oldenlandia corymbosa* L.	Rubiaceae	D	Emergent
50	*Phyla nodiflora* (L.) Greene	Verbenaceae	D	Emergent
51	*Perscaria glabra* (Willd.) M.Gomez	Polygonaceae	D	Emergent
52	*Perscaria barbeta* (L.)H. Hara	Polygonaceae	D	Emergent

53	*Potamogeton nodosus* Poir.	Potamogetonaceae	M	Submerged
54	*Potamogeton crispus* L.	Potamogetonaceae	M	Submerged
55	*Portulaca oleraceae* L.	Portulacaceae	D	Emergent
56	*Pistia stratiotes* L.	Araceae	M	Free floating
57	*Ranunculus sceleratus* L.	Ranunculaceae	D	Emergent
58	*Rotala indica* Blatt. &Halb.	Lythraceae	D	Emergent
59	*Rotala rotundifolia* (Roxb.) Koehne	Lythraceae	D	Emergent
60	*Rumex dentatus* L.	Polygonaceae	D	Emergent
61	*Sagittaria trifolia* L.	Alismataceae	M	Emergent
62	*Sphaeranthus indicus* L.	Asteraceae	D	Emergent
63	*Spirodela polyrrhiza* (L.) Schleid.	Araceae	M	Free floating
64	*Typha angustata* Bory & Choub.	Typhaceae	M	Emergent
65	*Utricularia aurea* Lour.	Lentibulareaceae	D	Submerged
66	*Vallisneria spiralis* L.	Hydrocharitaceae	M	Submerged
67	*Wolffia globosa* (Roxb.) Hartog & Plas	Araceae	M	Free floating
68	*Zannichellia palustris* L.	Potamogetonaceae	M	Submerged

Ottelia alismatoides

Hydrilla verticillata

Vallisnaria spiralis

Typha angustata

Sagittaria sagittifolia

Pistia stratiotes

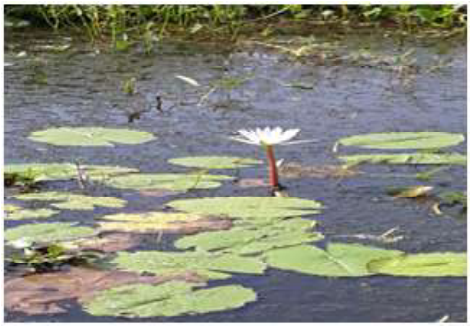
Acorus calamus

Potamogeton nodosus

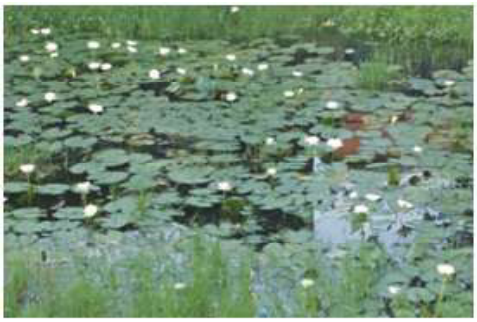
Hygrorhiza aristata

Eriocaulon cinerum

Ranunculus sceleratus



Nymhaea pubescens



Nymphaea nouchali

Nelumbo nucifera

Ludwigia adscendens

Enhydra fluctuans

Spaeranthes indicus

Nymphoides indicum

REFERENCES

1. **Mooney, H.F. 1950.** *A supplement to the Botany of Bihar & Orissa*. Catholic Press, Ranchi.
2. **Christopher, C. 2006.** Study on the diversity of the aquatic vascular plants in Karikkakom, Thiruanant puram. *Ecol. Env. & Conc.* **12(4):** 661- 663.
3. **Cook, C.D.K.1996.** *Aquatic and Wetland plants of India* Oxford University Press, New York.
4. **Gupta, O.P. 1979.** *Aquatic weeds their menace and control. A text book and manual*. Today & tomorrow's Printers & Publisher, New Delhi.
5. **Jha, U.N. 1965.** Hydrophytes of Ranchi. *Trop. Ecol*. **6:**96-105.
6. **Kachroo, P. 1959.** Aquatic vegetation of Damodar Valley. I. Phanerogamic flora of forest water ponds, etc. *J. Asiat. Soc. Bengal.* **1:** 271-289.
7. **Maheshwari, J.K. 1960.** The vegetation of marshes, swamps and riversides in Khandwa District (Madhya Pradesh) J. Bombay Nat. Hist. Soc. **51:** 371-387.
8. **Majumdar N.C. 1965.** Aquatic and semiaquatic flora of Calcutta and adjacent localities. *Bull. Bot. Soc. Bengal*. **19:** 10-17.
9. **Mukherjee, P. 2001.** *The Floristic and Ecological studies of Aquatic Angiosperms of Lohardaga*. Ph.D. Thesis, Ranchi University, Ranchi (Unpublished).
10. **Mukherjee, P. & Kumar, P. 2003.** Studies on the angiospermic flora of ponds of Ranchi (Jharkhand). *Proceeding Nat. Sem.on Biodiversity, Taxonomy and Conservation.* Majalgaon College, Majalgaon.
11. **Mukherjee P. and Ghosh T.K. 2015.** Aquatic and Semi aquatic angiospermic flora of Lohardaga (Jharkhand) *Phytotaxonomy.* **15:** 134-145.
12. **Naskar, K.R. 1990.** *Aquatic & Semi-aquatic plants of the lower Ganga Delta.* Daya Publishing House, Delhi.
13. **Subramanyam, K. 1962.** *Aquatic Angiosperms.* CSIR, New Delhi.
14. **Singh, A.1998.** Floristic composition and vegetation profile of aquatic angiosperms of Hazaribag and adjacent area. Ph.D. Thesis, V.B.University Hazaribagh, (Unpublished).
15. **Singh, M. P. 1990.** Hydrophytes of Ranchi *J. Econ. Taxon. Bot.* **14:3**.
16. **Verma S.K. and Pandeya P.K. 2007.** Ethnomedicinal use of some aquatic plants in Jharkhand. *J. Haemotol & Ecotoxicol*. **2(1):** 34-37.
17. **Verma, S.K. and Pandeya P.K. 2008.** Floristic studies of Aquatic and Semi aquatic Angiosperms of Ratu Maharaja Pond, Ranchi, Jharkhand. *Biospectra*. **2(1):** 139-41.
18. **Mukherjee P. and Kumar J. 2019.** Studies on the aquatic and semi- aquatic Angiosperms of Kanke Dam, Ranchi, Jharkhand, *Phytotaxonomy*, Vol. **18.**
19. **Mukherjee P. and Kumar J. 2020.** Floristic Studies on Aquatic and Semi Aquatic Angiosperms of Major Water Bodies of Jharkhand, *J. Indian bot. Soc*. **100 (3&4):** 119-133.

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