

## DIVERSITY OF MONOCOTYLEDONOUS PLANTS OF WETLANDS IN PURULIYA DISTRICT, WEST BENGAL

SUJIT KUMAR MANDAL<sup>a1</sup> AND AMBARISH MUKHERJEE<sup>b</sup>

UGC Centre for Advanced Study in Botany, Burdwan University, Burdwan, West Bengal, India

<sup>a</sup>E-mail : smondalbot@gmail.com

<sup>b</sup>E-mail : ambarishmukherjee@rediff.mail.com

### ABSTRACT

The present work enumerates monocotyledonous plant diversity associated with 38 wetlands of Puruliya which is one of the hottest districts of West Bengal State. In total 52 species representing 36 genera of 14 monocot families could be identified from such habitats which are enumerated along with their respective occurrence in 31 out of 38 wetlands spread in 19 out of 20 Blocks of the district. Thus there were seven wetlands providing no accommodation to the monocot plants. The most comfortable wetland for them is the Sahebbundh (Nibaransayar) in Puruliya which was found to sustain no less than 17 species. Other favourable wetlands for monocots are Adra Sahebbundh, Kalidaha (Jore), Rampur Barabundh and Ketankiyari (Jore). A thorough systematic assessment of the ecological value and economic potential of the monocotyledonous plant diversity is emphasized.

**KEYWORD** : Monocotyledonous plants, diversity, Puruliya, wetlands, ecological value

Wetlands constitute a subject of global importance; this has been particularly so ever since 1971 when the first international convention on wetlands was held in Ramsar, Iraq. Wetlands cover about six percent of total earth surface and are well known for high diversity in class, composition and four broad categories of functions viz. physical, hydrological, chemical, biological and socioeconomic. Wetlands have been realized to be a very precious natural resource and a national wealth which must be sustained for both ecological welfare and economic prosperity. For this there is a need to inventorize wetlands with geographical locations, at least on regional basis, and to characterize their biotic and abiotic structures and functions. In view of this and extreme scarcity of water in Puruliya, one of the hottest districts of West Bengal State, a research programme was launched on its wetlands in 2006 by the present authors with the objective of preparing a wetland-database capable of proving very useful in restoration and optimization of their ecological functions and economic values, as and when necessary. The present work is a part of such an ongoing research programme and is in conformity with an earlier work (Mukherjee and Mandal, 1987).

### STUDY SITE

Puruliya district, located between 23° 42' North and 22° 43'South latitudes and 86° 54'East and 85° 49'West longitudes with an area of 6259.00 sq Km and 20 Blocks

(Anon., 1985), was selected as the study site where wetlands play a significant role in the life of the local people. The principal rivers in this lateritic district are the non-perennial Dwarakeswar, Shilabati and Kangsabati.

### MATERIALS AND METHODS

Block wise field surveys in different parts of the district were undertaken since 2006 for locating and studying wetlands. Location of each wetland in terms of Mouza, Block, Latitude and Longitude were ascertained and recorded. Specimens of monocotyledonous species occurring in different wetlands were collected from time to time, worked out taxonomically for identification and processed for herbarium preservation in form of voucher specimens. For correct identification and nomenclature, pertinent literature had to be consulted (Prain, 1903; Subramanyam, 1962; Bennet, 1987; Cook, 1996). The concerned wetlands (Table I) and monocot species (Table II) were enumerated in alphabetic order separately giving all necessary particulars.

### RESULTS AND DISCUSSION

Out of 20 Blocks in the district, 19 blocks were covered in the present work where from in all 38 wetlands could be identified from rural and urban areas in different parts of the district which ranged in area from 4 to 100 acres (Table I). Interestingly monocotyledonous plants could not

<sup>1</sup>Corresponding author

MANDALAND MUKHERJEE: DIVERSITY OF MONOCOTYLEDONOUS PLANTS OF WETLANDS IN PURULIYA...

be found in 7 wetlands viz., Benabundh (Manbazar), Deshbundh (Kharbar), Gayerbundh (Tiyashi), Ghosalpukur (Puncha), Khagerbundh (Puncha), Lihirbundh (Jhalda), and Ruknibundh (Guniyara). In the remaining wetlands

monocotyledonous plants are represented by 52 species of 36 genera belonging to 14 families (Table II). Species like *Hydrilla verticillata*, *Vallisneria spiralis*, *Typha domingensis* are highly abundant while *Eichhornea*

**Table I: An inventory of wetlands occurring in different parts of Puruliya District, West Bengal**

Sl.No	Name of the wetland	Mouza	Block	Latitude	Longitude
1.	Adra Sahebbundh	Manpura	Kashipur	23° 48'N	86°70'E
2.	Angarkhuri	Chharra	Puruliya II	23° 21'N	86° 47'E
3.	Babirbundh (Sabir bundh)	Babiddi	Kashipur	23°37'N	86°75'E
4.	Barikbundh	Raghunathpur	Raghunathpur I	23° 55'N	86° 67'E
5.	Benabundh	Manbazar	Manbazar I	23° 27'N	86° 37'E
6.	Benagora	Sankra	Para	23° 50'N	86 °49'E
7.	Buro Sayar	Mangalda	Raghunathpur II	23° 56'N	86° 68'E
8.	Deshbundh	Kharbar	Santuri	23° 51'N	86° 85'E
9.	Dewanbundh	Kalidaha	Kashipur	23° 37'N	86° 75'E
10.	Dhanarbundh	Akunja	Raghunathpur	23° 55'N	86° 67'E
11.	Ganakbundh	Damda	Puruliya I	23 ° 34'N	86° 36'E
12.	Gayerbundh	Tiyashi	Santuri	23 ° 51'N	86 °85'E
13.	Gaylabundh	Lalpur	Hura	23° 30'N	86° 65'E
14.	Ghosal Pukur	Puncha	Puncha	23 °15'N	86 °65'E
15.	Gobinda Sayar	Patharmura	Manbazar I	23 ° 27'N	86° 37'E
16.	Gorsairbundh / Namobundh	Barabazar	Barabazar	23° 30'N	86° 36'E
17.	Guniyara Bara bundh	Guniyara	Neturiya	23° 58'N	86° 71'E
18.	Hanumata dam	Mudidi, Dumari, Khairadi	Balarampur	23° 12'N	86° 26'E
19.	Joypur Ranibundh	Joypur	Joypur	23° 36'N	86° 32'E
20.	Kalidaha (jore)	Kalidaha	Kashipur	23 °37'N	86° 75'E
21.	Kamalabundh	Baghmundi	Baghmundi	23 °19'N	86° 06'E
22.	Ketankiyari (Jore)	Ketankiyari	Kashipur	23 °38'N	86° 76'E
23.	Khagerbundh	Puncha	Puncha	23 °15'N	86° 65'E
24.	Kumaridam	Baraurma, Dubrajpur, Panjanbera	Balarampur	23 °16'N	86° 29'E
25.	Lihirbundh	Jhalda	Jhalda I	23° 37'N	85° 97'E
26.	Mahatobundh	Kantadi, Pithati	Arsha	23° 32'N	86° 36'E
27.	Maidhara	Patharmura	Manbazar I	23 °27'N	86° 37'E
28.	Nutanbundh	Puruliya	Puruliya I	23 °34'N	86° 36'E
29.	Pokabundh	Banduan	Banduan	22° 88'N	86° 50'E
30.	Purano Sayar	Chharra	Puruliya II	23° 21'N	86° 47'E
31.	Rajabundh	Puruliya	Puruliya I	23° 32'N	86° 37'E
32.	Rampur Barabundh	Rampur	Kashipur	23° 38'N	86° 76'E
33.	Ranibundh	Baghmundi	Baghmundi	23° 19'N	86° 06'E
34.	Ruknibundh	Guniyara	Neturiya	23° 58'N	86° 71'E
35.	Sahebbundh / Nibaran Sayar	Puruliya	Purulia I	23 ° 20'N	86° 21'E
36.	Sankra Barabundh	Sankra	Para	23° 50'N	86° 49'E
37.	Sayarbundh	Kharidua	Manbazar II	23° 24'N	86° 39'E
38.	Sindripathar	Karangberiya	Kashipur	23° 38'N	86° 76'E

MANDAL AND MUKHERJEE: DIVERSITY OF MONOCOTYLEDONOUS PLANTS OF WETLANDS IN PURULIYA...

Table II: The enumeration of monocotyledonous species associated with the wetlands in Puruliya District.

SL. No.	Name of the Plant	Family	Serial number. of Wetland where occurring	Field No.	Prevalence (%) of the species in wetlands studied	Remarks
1.	<i>Aponogeton appendiculatus</i> H. Bruggen	Aponogetonaceae	1	MM – 324 MM – 333	2.63	Rare
2.	<i>Aponogeton natans</i> (L.) Engler et. Krause	Aponogetonaceae	1	MM – 334	2.63	Rare
3.	<i>Aponogeton Undulatus</i> Roxb	Aponogetonaceae	22	MM – 240	2.63	Rare
4.	<i>Blyxa japonica</i> (Miq) Max. ex Ascher. et Gurke var. <i>japonica</i>	Hydrocharitaceae	3, 20, 32,	MM – 257 MM – 330 MM – 332 MM – 456	7.89	Common
5.	<i>Brachiaria eruciformis</i> (J.E. Smith) Griseb	Poaceae	1	MM – 345 MM – 347	2.63	Rare
6.	<i>Colocasia esculenta</i> (L.) Schott	Araceae	29,35	MM – 438 MM - 515	5.26	Common
7.	<i>Commelina benghalensis</i> L.	Commelinaceae	4 , , 32, 35, 38	MM – 490 MM – 493 MM – 492 MM - 529	10.52	Very Common
8.	<i>Commelina paludosa</i> Bl.	Commelinaceae	7, 31, 35	MM – 358 MM – 360 MM - 391	7.89	Common
9.	<i>Cynodon dactylon</i> (L.) Pers	Poaceae	2, 21,33,35	MM – 287 MM – 514 MM-577 MM-578	10.52	Very Common
10.	<i>Cyperus difformis</i> L.	Cyperaceae	24	MM – 417	2.63	Rare
11.	<i>Cyperus halpan</i> L.	Cyperaceae	9	MM – 486	2.63	Rare
12.	<i>Cyperus iria</i> L.	Cyperaceae	9	MM – 484	2.63	Rare
13.	<i>Cyperus platystylis</i> R. Br.	Cyperaceae	19	MM – 370	2.63	Rare
14.	<i>Echinochloa crusgalli</i> (L.) Beauv.	Poaceae	35	MM – 286 MM – 293	2.63	Rare
15.	<i>Eichhornia crassipes</i> (Mart.) Solms	Pontederiaceae	3, 29, 31, 35,	MM - 305 MM – 307 MM – 539 MM – 540	10.52	Very Common
16.	<i>Eleocharis atropurpurea</i> (Retz.) Presl.	Cyperaceae	3, 32	MM – 308 MM -524	5.26	Common
17.	<i>Eleocharis retroflexa</i> (Poir.) Urb.	Cyperaceae	3	MM-309	2.63	Rare
18.	<i>Eriocaulon quincongulare</i> L.	Eriocaulaceae	9,20,	MM – 462 MM – 463	7.89	Common
19.	<i>Fimbristylis miliacea</i> (L.) Vahl	Cyperaceae	1, 15, 19,	MM – 348 MM – 368 MM – 441	7.89	Common

MANDAL AND MUKHERJEE: DIVERSITY OF MONOCOTYLEDONOUS PLANTS OF WETLANDS IN PURULIYA...

20.	<i>Fimbristylis polytrichoides</i> (Retz.) Vahl	Cyperaceae	22	MM 241	2.63	Rare
21.	<i>Fuirena ciliaris</i> (L.)Roxb.	Cyperaceae	32	MM – 270	2.63	Rare
22.	<i>Hygroryza aristata</i> (Retz.) Nees ex Wright	Poaceae	1	MM – 346	2.63	Rare
23.	<i>Hydrilla verticillata</i> (L.f.) Royle	Hydrocharitaceae	2, 3, 9, 10, 11, 13, 16, 17, 20, 22, 26, 27, 35, 32	MM – 265 MM – 238 MM – 413 MM – 425 MM – 407 MM – 443 MM – 517 MM – 520 MM – 513 MM – 530 MM – 532 MM – 534 MM – 535 MM – 538	36.84	Very Common
24.	<i>Juncus prismatocarpus</i> R. Br.	Juncaceae	22	MM - 246	2.63	Rare
25.	<i>Kyllinga brevifolia</i> Rottboll.	Cyperaceae	20, 35	MM – 254 MM - 436	5.26	Common
26.	<i>Leersia hexandra</i> Sw.	Poaceae	1, 10, 35	MM – 350 MM – 355 MM – 400 MM – 510	7.89	Common
27	<i>Monochoria hastata</i> (L.) Solms	Pontederiaceae	28, 35	MM-564, MM-565	5.26	Common
28	<i>Monochoria vaginalis</i> (Burm. f.)C. Presl.	Pontederiaceae	3, 22,28	MM-566 MM-569, MM-570	7.89	Common
29	<i>Murdannia nudiflora</i> (L.) Brenan	Commelinaceae	1, 32, 35	MM-352, MM-522, MM-527	7.89	Common

MANDAL AND MUKHERJEE: DIVERSITY OF MONOCOTYLEDONOUS PLANTS OF WETLANDS IN PURULIYA...

30.	<i>Murdannia spirata</i> (L.) Bruck.	Comme linaceae	22	MM – 247	2.63	Rare
31.	<i>Najas graminea</i> Del.	Najada ceae	1, 35,	MM – 337 MM - 528	5.26	Common
32.	<i>Najas malesiana</i> de Wilde	Najada ceae	20	MM - 256	2.63	Rare
33.	<i>Najas minor</i> All.	Najadaceae	19, 35	MM – 278 MM - 376	5.26	Common
34.	<i>Nechamandra alternifolia</i> (Roxb.ex Wight) Thw.	Hydrocharitaceae	20, 26, 32	MM – 259 MM – 260 MM – 427 MM – 459	7.89	Common
35.	<i>Oplismenus compositus</i> Beauv.	Poaceae	1	MM – 341	2.63	Rare
36.	<i>Oryza sativa</i> L.	Poaceae	19	MM - 371	2.63	Rare
37.	<i>Ottelia alismoides</i> (L.) Pers.	Hydrocharitaceae	32	MM – 457 MM - 460	2.63	Rare
38.	<i>Panicum paludosum</i> Roxb.	Poaceae	1, 11, 35	MM – 331 MM – 343 MM – 359 MM - 415	7.89	Common
39.	<i>Panicum repens</i> L.	Poaceae	19, 35	MM _ 285 MM – 288 MM – 290 MM - 372	5.26	Common
40.	<i>Paspalum conjugatum</i> Berg.	Poaceae	19, 31, 35	MM – 291 MM – 292 MM – 361 MM – 373	7.89	Common
41.	<i>Potamogeton crispus</i> L.	Potamogetonaceae	20, 22, 32	MM – 458 MM – 516 MM - 519	7.89	Common
42.	<i>Potamogeton nodosus</i> Poir.	Potamogetonaceae	1, 2, 11, 16	MM – 335 MM – 344 MM – 408 MM – 414 MM - 432	10.52	Very Common
43.	<i>Sagittaria guyanensis</i> Humbolt.	Alismataceae	1	MM – 304 MM - 313	2.63	Rare
44.	<i>Sagittaria sagittifolia</i> L.	Alismataceae	1	MM – 315	2.63	Rare
45.	<i>Schoeno- plectus articulatus</i> (L.) Palla	Cyperaceae	9, 32	MM – 488 MM – 525	5.26	Common
46.	<i>Schoe- noplectus grossus</i> (L. f.) Palla	Cyperaceae	9, 20	MM – 489 MM – 491	5.26	Common
47.	<i>Spirodela intermedia</i>	Lemnaceae	28, 35	MM – 284	5.26	Common

MANDAL AND MUKHERJEE: DIVERSITY OF MONOCOTYLEDONOUS PLANTS OF WETLANDS IN PURULIYA...

49.	<i>Tonningia axillaris</i> (L.) O. Kuntze	Commelinaceae	9, 20	MM – 255 MM - 263	5.26	Common
50	<i>Typha domingensis</i> persoon	Typhaceae	4, 18, 20, 22, 24, 38	MM – 471 MM – 475 MM – 480 MM – 481 MM – 477 MM - 482	15.78	Very Common
51.	<i>Vallisneria spiralis</i> L.	Hydrocharitaceae	4, 6, 7, 15, 20, 32, 35,, 36, 37	MM – 430 MM – 440 MM – 518 MM – 521 MM – 526 MM – 531 MM – 533 MM – 536 MM - 537	23.68	Very Common
52.	<i>Vetiveria zizanioides</i> (L.) Nass	Poaceae	1	MM- 448	2.63	Rare

*crassipes*, *Commelina benghalensis*, *Murdannia spirata* and *Potamogeton nodosus* are relatively less common ranging in prevalence from 36.84 to 10.52% in the wetlands studied. *Ottelia alismoides*, *Aponogeton appendiculatus*, *A.natans*, *A.undulatus*, *Eleocharis retroflexa*, *Vetiveria zizanioides*, *Hygroryza aristata*, *Juncus prismatocarpus*, *Fuirena ciliaris*, *Brachiaria eruciformis* etc are rare.

In descending order of numerical strength of monocot species, the wetlands can be arranged as: Purulia Sahebbundh(17 species), Adra Sahebbundh(14 species), Kalidaha Jore(11 species), Rampur Barabundh(11 species) and Ketankiyari Jore(8 species). Purulia Sahebbundh (Nibaransayar) alone covers 32.69% and Ketankiyari (Jore) 15.38% of the total species identified.

In descending order of the values of prevalence (%), seven dominant families appear to be Hydrocharitaceae (55.26%), Poaceae (28.67%), Cyperaceae(23.95%), Commelinaceae (26.31%), Potamogetonaceae (18.42%), Pontederiaceae(18.42%) and Typhaceae (15.78%). The diversity thus recorded for monocots seems to be quite low as is evidenced from the species quota for each wetland which is 1.37. A thorough quantitative assessment of the monocotyledonous plant diversity is necessary for working out the ecological value and economic potential and fulfilling the objective of sustaining the diversity at an optimum state.

#### ACKNOWLEDGEMENTS

The authors are grateful to Sri Salil Kumar Chakraborty, Headmaster, Bibarda Satchidananda Vidyapith, Bibarda, Bankura for his Co-operation and constant encouragement.

#### REFERENCES

- Anonymous;1985. West Bengal District Gazetteer, Puruliya, Govt. of India.
- Bennet S.S.R.; 1987. Name Changes in Flowering Plants of India and Adjacent Region. Triseas Publ., Dehradun, India.
- Cook C.D.K.;1996. Aquatic and Wetland Plants of India, Oxford Publ., London, U.K.
- Mandal S.K. and Mukherjee A.; 2007. Wetlands and their macrophytes in Puruliya District, West Bengal, Environment & Ecology, **25(3)**:564-570.
- Prain D.;1903. Bengal Plants, Govt. of India, Central Publication Branch, Calcutta.
- Subramanyam K.; 1962. Aquatic Angiosperms. CSIR, New Delhi, India.