



## FLORISTIC STUDIES ON AQUATIC AND SEMI AQUATIC ANGIOSPERMS OF MAJOR WATER BODIES OF JHARKHAND

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The present paper deals with aquatic and semi aquatic angiosperms growing in the major water bodies of Jharkhand. Intensive floristic survey of aquatic and semiaquatic Angiosperms of Jharkhand during 2014 to 2019 has revealed the presence of 272 species, belonging to 157 genera, distributed over 67 families of angiosperm. Out of 272 Aquatic and Semi aquatic angiospermic species 137 are monocotyledons belonging to 80 genera and 23 families where as 135 taxa are dicotyledons belonging to 77 genera and 44 families.

**Key words:** Aquatic and Semi aquatic, Angiosperms, Jharkhand, Floristic survey.

Aquatic plants are those species which normally grow in water and grow for at least a part of their life cycle in water (Muenscher 1944). Aquatic plant may also be defined as the plant water, as their seed germinate in either the water phase or the substrate of a body of water or which must spend a part of their life cycle in water (Reid 1961). Aquatic flora or plants survives in water are also called hydrophytes. It can be defined as the plants which grow in water and which spends at least a part of their life cycle in water (Cook 1996) or Aquatic plants are those which grow in water at least during a major portion of the growing season, rooted or free floating and whose growth is favored by water logging condition. The aquatic and marsh vegetation is quite rich and diverse almost all type of life forms of aquatic plants are recognized in Indian wetlands. Approximately half of the aquatic flowering plants are present in India (Nagendran and Arkel 1981). It is very important that aquatic plants must grow in the water bodies because without the aquatic plants consequently the aquatic animals the water bodies will just look like as “water desert” (Gupta 1979).

Several floras at local level have been initiated in Jharkhand i.e. was once the combined Bihar prior to 2000, the famous flora of Bihar and Orissa (Hains 1921-25) and its supplement (Mooney 1950) is the pioneer work in this

direction. Bengal plants is known flora of the neighboring state west Bengal (Prain 1963). Flora of Ranchi (Ghosh 1971), Flora of Monghyr (Singh 1980), Botany of Ranchi (Bressers 1951), Flora of Patna (Singh 1986), Flora of Bhagalpur (Verma 1981), Alien Invasive Flora of Santhal Pargana (Mukherjee and Dutta 2018), (Mukherjee 1919).

The study of the aquatic plants has received least attention in our country in comparison to the floristic studies of the terrestrial plants. Till 1935 no perfect work was taken up in the country. The common water and marsh plant of India and Burma was the first comprehensive work on aquatic plants of India (Calder and Biswas 1936). Gradually a number of book on aquatic and semi aquatic plants were published. Important among them are aquatic and wetland plants of India that is a reference book and identification manual for the vascular plants found in permanent or seasonal fresh water in the sub-continent of India south of the Himalayas (Cook 1996). Aquatic and semi aquatic plants of Lower Ganga Delta (Naskar 1990), control and management of the aquatic weed (Mathur *et al.* 20015). Aquatic Weeds In South East Asia, (Varshney and Rzoska 1975). A Manual of Aquatic Plants (Fassett 1998), Aquatic Angiosperms. (Subramanaym 1962). Cyperaceae of North East India, (Rao and Verma 1984). Discussing about the aquatic literature available internationally of a large

number of work has been done, few of them has been discussed here in brief. The study on aquatic angiosperms growing throughout the Rajshahi University Campus was carried out Bangladesh. (Rahman *et al.* 2007). A preliminary checklist of vascular aquatic macrophytes of Iran (Yousefi and Tonaz 2015). Study of Aquatic and Semi aquatic Plants of Aquatic Ecosystems of Siahrud-e Rudbar Protected Area is in N. Iran and Bioaccumulation of Heavy Metals by these Plants explains about the aquatic and semi aquatic flora of the Siahrud-e Rudbar Protected Area was also investigated. (Somayeh 2011). Local level work on aquatic plant is gaining momentum very fast, as far as Jharkhand is concerned the aquatic and semi aquatic flora of district level has been done, studies on aquatic and semi aquatic angiosperms of Lohardaga reflecting 213 species out of that 96 dicotyledons and monocotyledons 117 (Mukherjee 2001). Studies on aquatic and semi aquatic angiosperms of Ranchi, reflecting 250 species out of that Dicotyledons species 123 and monocotyledons species is 127( Verma 2008). Study of aquatic weeds and their control in and around Jamtara district, has been under taken ( Jha 2018) , another work on aquatic and semi aquatic species includes “The Floristic And Ecological Studies Of Aquatic Angiosperm of Jamtara District And Adjoining Barakar Basin” that reflects 155 species of aquatic and semi aquatic species out of that number of monocotyledons species is 73 and number of Dicotyledons species is (Sarkar 2008) , where as in the selected water bodies of Jubilee Park, while studying the “Studies on Floristic Diversity of Jubilee Park of Jamshedpur”, reveals the presence 62 species of aquatic macrophytes belonging to 50 genera and 32 families( Kumari 2011) . Similarly the floristic composition and vegetation profile of aquatic angiosperms of Hazaribag and adjacent area has also been undertaken.(Singh 1999) A very good Pictorial Guide to Aquatic Macrophytes of the Damodar River Basin in Jharkhand and West Bengal has been published, is good guide for the identification

of the macrophytes with 45 species( Sharma and Nasemann 2013).

Various papers on aquatic and semi aquatic has been published by a number of authors Important among them, Studies on Angiospermic Flora of Ponds of Ranchi (Jharkhand), ( Mukherjee and Kumar 2002), Hydrophytes of Ranchi. (Jha 1965), (Singh 1990). Work on Floristic studies of Aquatic and Semi aquatic Angiospermic Bio-diversity of Ranchi has also been published (Verma and Pandey 2008). A weeds diversity of Pakur has been published reflecting 221 species of angiospermic weeds including aquatic and semi aquatic habitat Mukherjee 2011). A floristic studies on ponds of Berahampur which a neighboring district of Jharkhand (Mukherjee and Das 2011).

Papers pertaining to aquatic and semi aquatic plants of an individual pond and water bodies have also been published which includes Floristic Studies of Aquatic and Semi aquatic angiosperms of Ratu Maharaja Pond, ( Mukherjee and Verma 2010). An ecological study of the BC college pond at Asansol (West Bengal) (Mukherjee, Chakraborty, and Jha 2010), Biodiversity of aquatic flora in Raja bandh pond of Jamtara district ( Jha, Singh and Varshney 2017), Aquatic Biodiversity of Victoria Lake of Lohardaga (Mukherjee 2009). Studies on the Aquatic and Semi aquatic Angiosperms of Kanke Dam, Ranchi (Mukherjee and Kumar 2019), Assessment of hydrophytes of Asansol in five different ponds and their surrounding muddy area of Asansol. (Chakraborty *et al.* 2012), exploration of aquatic angiosperms of an Ox-bow lake Dah-Reoti (Ballia) of Eastern Uttar Pradesh (Jha *et al.* 2009).

A survey conducted in the Dumka district reveals the occurrence of 30 species of invasive aquatic and semi aquatic medicinal plant representing 26 genera and 17 families ( Mukherjee and Kumar 2017), effects of industrial effluents of IISCO on pond ecosystem, Asansol, West Bengal ( Chakraborty 2012). The range of aquatic



Map of Jharkhand

vegetation with reference to Asteraceae family in Jamtara district of Jharkhand state. (Mukerjee and J. Kumar 2017). A total of 45 aquatic weeds belonging to 35 families are recorded from the fresh water habitats of Rourkela (Mohanta and Mahata 2009). 36 rare species of angiosperms from 38 wetlands of which 16 species and 13 genera belonging to 12 dicotyledonous families and 20 species and 14 genera belonging to 7 monocotyledonous families have been reported In Ponds of Puruliya (Mandal and Mukherjee 2017). Flowering and fruiting responses of 182 angiospermic species occurring in wetlands of Birbhum district. (Palit *et al.* 2017).

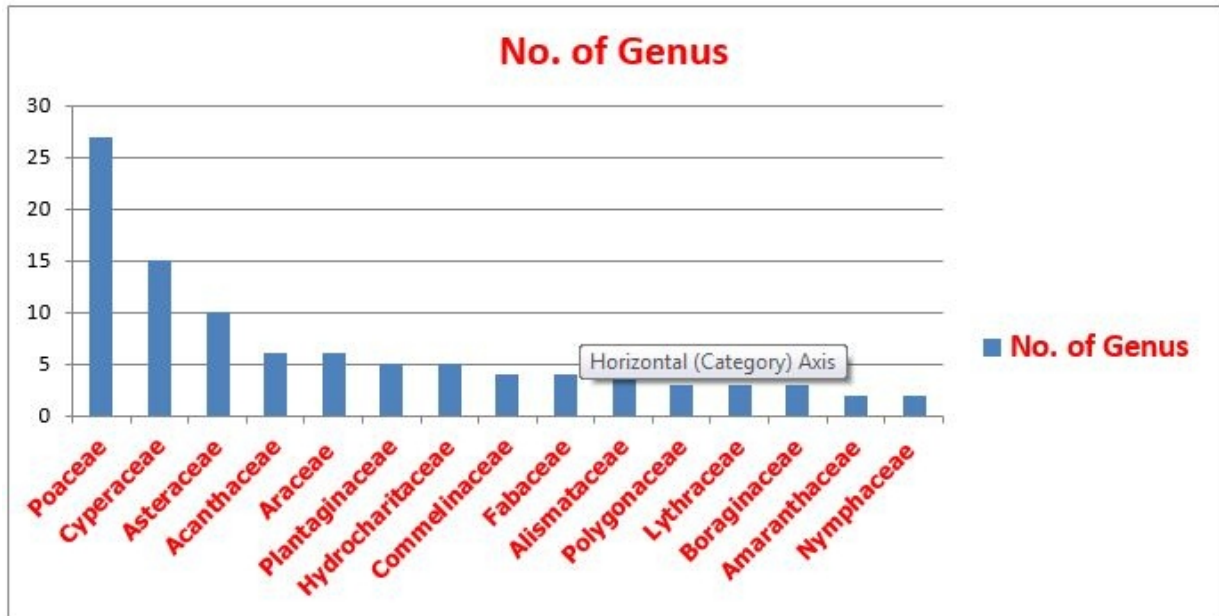
## MATERIALS AND METHOD

### STUDY AREA

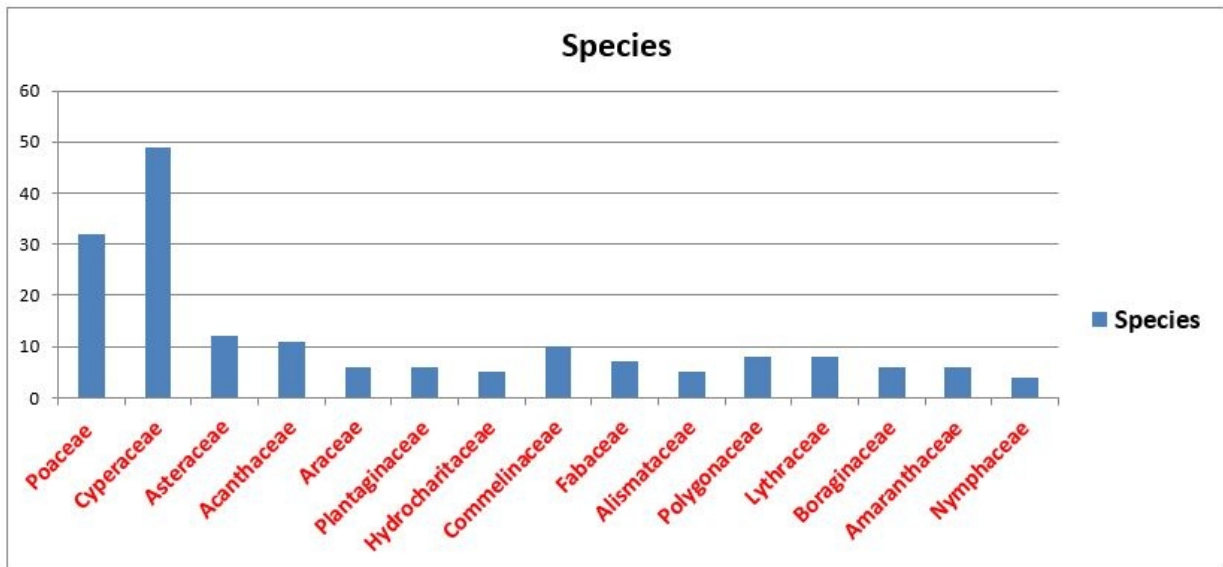
Jharkhand is carved out Bihar on 15th November 2000. Jharkhand is one of the most considerable mineral producing States of India. Jharkhand state of India is divided into five Administrative Divisions namely South

Chhotanagpur, North Chhotanagpur, Kolhan, Palamu and Santhal Parganas. It contributes 39 percent mineral revenue of the Nation . Total forest cover of the state is 29% of the total area . The land is eastern corner of Vindhya mountain series and has rich plant and ethnic diversities. It lies between latitude 22°00' and 24°37' N and longitude 83°15' and 87°01' E. Height of the Jharkhand plateau ranges between 1000 -3000 ft. above the mean sea level. Jharkhand is surrounded by five states namely West Bengal, Chhattisgarh, Odisha, Uttar Pradesh and Bihar. All these districts have ample numbers of water bodies which harbours a variety of aquatic and semi aquatic plants.

Regular and intensive field visit were made in the ponds and other water bodies of all the 24 districts of Jharkhand from the year 2014 - 2019. The sites were visited at list twice in every season. Considering the delicate nature of aquatic plants, greater care was exercised while removing them from water so that they might not lose their significant taxonomic characters. During field work, important



**Bar -1:** Bar showing 15 Dominant families with their no. of genera in aquatic and semi aquatic angiosperms of Jharkhand



**Bar II:** Bar showing 15 Dominant families with their no. of species in aquatic and semi aquatic angiosperms of Jharkhand

characters like habit, colour of the plants, height of the plants, 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 formalin. Just after returning from the field, the plants were studied in the laboratory on the very same day. The field numbers were verified and flowers dissected

and the plants were identified with the help of local floras.

After specific identification and study, the plants were dried and pressed under heavy herbarium press. Before pressing, the plants were poisoned in 2% saturated 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



**Table-I:** Aquatic and semi-aquatic taxa of major water bodies of Jharkhand

Sl. No.	Plant Name	Family	Availability	Flowering & Fruiting Time	Habitat	Monocot/Dicot
1.	<i>Ranunculus sceleratus</i> L.	Ranunculaceae	Very common	Nov. – Feb.	Aquatic	Dicot
2.	<i>Eurale ferox</i> Salisb.	Nymphaeaceae	Rare	May – Dec.	Aquatic	Dicot
3.	<i>Nymphaea nouchali</i> Burm. f.	Nymphaeaceae	Very common	Throughout the rainy season	Aquatic	Dicot
4.	<i>Nymphaea pubescens</i> Willd.	Nymphaeaceae	Common	Aug. – Oct.	Aquatic	Dicot
5.	<i>Nymphaea rubra</i> Roxb. ex Salisb.	Nymphaeaceae		Sept. – Dec.	Aquatic	Dicot
6.	<i>Nelumbo nucifera</i> Gaertn.	Nelumbonaceae	Common	July – Nov.	Aquatic	Dicot
7.	<i>Cochlearia cochlearioides</i> (Roth) Santapau & Maheshw.	Brassicaceae	Less common	Sep. – Feb.	Semi aquatic	Dicot
8.	<i>Spergula arvensis</i> L.	Caryophyllaceae	Very common	Dec. – March	Semi aquatic	Dicot
9.	<i>Spergula falax</i> (Lowe) E.H.L. Krause	Caryophyllaceae	Very common	Dec. – March	Semi aquatic	Dicot
10.	<i>Portulaca oleracea</i> L.	Portulacaceae	Very common	April – June	Moist loving	Dicot
11.	<i>Portulaca quadrifolia</i>	Portulacaceae	Common	Aug. – Dec.	Moist loving	Dicot
12.	<i>Bergia ammannioides</i> Roxb. ex Roth	Elatinaceae	Less common	Nov. – Jan.	Aquatic	Dicot
13.	<i>Urena lobata</i> L.	Malvaceae	Common	Aug. – Nov.	Moist loving	Dicot
14.	<i>Oxalis corniculata</i> L.	Oxalidaceae	Very common	Oct. – July	Semi aquatic	Dicot
15.	<i>Oxalis latifolia</i> Kunth	Oxalidaceae	Common	Oct. – March	Semi aquatic	Dicot
16.	<i>Biophytum sensitivum</i> (L.) DC.	Oxalidaceae	Rare	July – Oct.	Moist loving	Dicot
17.	<i>Aeschynomene aspera</i> L.	Fabaceae	Common	Sept. – Jan.	Aquatic	Dicot
18.	<i>Aeschynomene indica</i> L.	Fabaceae	Common	Aug. – Nov.	Aquatic	Dicot
19.	<i>Alysicarpus bupleurifolius</i> (L.) DC.	Fabaceae	Less common	Aug. – Nov.	Moist loving	Dicot
20.	<i>Alysicarpus rugosus</i> (Willd.) DC.	Fabaceae	Less common	Aug. – Nov.	Moist loving	Dicot
21.	<i>Melilotus albus</i> Medik.	Fabaceae	Less common	Dec. – April	Moist loving	Dicot
22.	<i>Melilotus indicus</i> (L.) All.	Fabaceae	Less common	Dec. – Jan.	Moist loving	Dicot
23.	<i>Medicago lupulina</i> L.	Fabaceae	Common	Dec. – March	Moist loving	Dicot
24.	<i>Drosera burmanni</i> Vahl	Droseraceae	Rare	Nov. – Jan.	Semi aquatic	Dicot
25.	<i>Drosera indica</i> L.	Droseraceae	Rare	Sep. – Feb.	Semi aquatic	Dicot
26.	<i>Myriophyllum tetrandrum</i> Roxb.	Haloragaceae	Common	Aug. – Dec.	Aquatic	Dicot
27.	<i>Myriophyllum tuberculatum</i> Roxb.	Haloragaceae	Common	Sept. – Jan.	Aquatic	Dicot
28.	<i>Ammania Auriculata</i> Willd.	Lythraceae	Less common	Sept. – Jan.	Aquatic	Dicot
29.	<i>Ammania baccifera</i> L.	Lythraceae	Common	Sept. – Jan.	Semi aquatic	Dicot
30.	<i>Ammania multiflora</i> Roxb.	Lythraceae	Common	Aug. – Feb.	Aquatic	Dicot
31.	<i>Rotala rotundifolia</i> (Buch.-Ham. ex Roxb.) Koehne	Lythraceae	Common	Dec. – March	Aquatic	Dicot
32.	<i>Rotala mexicana</i> Schtdl. & Cham	Lythraceae	Rare	Sep. – Jan.	Semi aquatic	Dicot
33.	<i>Rotala densiflora</i> (Roth) Koehne	Lythraceae	Common	Nov. – March	Moist loving	Dicot
34.	<i>Rotala indica</i> (Willd.) Koehne	Lythraceae	Less common	Aug. – Nov.	Aquatic	Dicot
35.	<i>Trapa natans</i> L.	Lythraceae	Cultivated	Sep. – Jan.	Aquatic	Dicot
36.	<i>Ludwigia adscendens</i> (L.) H. Hara	Onagraceae	Common	Throughout the year	Aquatic	Dicot
37.	<i>Ludwigia hyssopifolia</i> (G. Don) Exell	Onagraceae	Common	Nov. – Jan.	Semi aquatic	Dicot
38.	<i>Ludwigia octovalvis</i> (Jacq.) P.H. Raven	Onagraceae	Common	Sept. – Feb.	Semi aquatic	Dicot
39.	<i>Ludwigia perennis</i> L.	Onagraceae	Common	Aug. – Jan.	Semi aquatic	Dicot
40.	<i>Glinus lotoides</i> L.	Molluginaceae	Common	Nov. – March	Moist loving	Dicot

41.	<i>Glinus oppositifolius</i> (L.) Aug. DC.	Molluginaceae		July – Sept.	Moist loving	Dicot
42.	<i>Mollugo cerviana</i> (L.) Ser.	Molluginaceae		May – June	Moist loving	Dicot
43.	<i>Gisekia pharnaceoides</i> L.	Gisekiaceae	Less common	Sept. – Jan.	Moist loving	Dicot
44.	<i>Centella asiatica</i> (L.) Urb.	Apiaceae	Common	Dec. – March	Semi aquatic	Dicot
45.	<i>Oldenlandia diffusa</i> (Willd.) Roxb.	Rubiaceae	Common	Aug. – Nov.	Moist loving	Dicot
46.	<i>Oldenlandia corymbosa</i> L.	Rubiaceae	Very common	July – Jan.	Moist loving	Dicot
47.	<i>Oldenlandia herbacea</i> (L.) Roxb.	Rubiaceae	Less common	July – Dec.	Moist loving	Dicot
48.	<i>Oldenlandia paniculata</i> L.	Rubiaceae	Less common	Aug. – Dec.	Moist loving	Dicot
49.	<i>Cyathocline purpurea</i> (Buch.-Ham. ex D. Don) Kuntze	Asteraceae	Rare	Dec. – March	Moist loving	Dicot
50.	<i>Grangea maderaspatana</i> (L.) Poir.	Asteraceae	Common	March – April	Moist loving	Dicot
51.	<i>Conyza stricta</i> Willd.	Asteraceae	Common	Jan. – April	Moist loving	Dicot
52.	<i>Blumea oxyodonta</i> DC.	Asteraceae	Common	Dec. – March	Moist loving	Dicot
53.	<i>Blumea laciniata</i> (Wall. exRoxb.) DC.	Asteraceae	Common	Feb. – May	Moist loving	Dicot
54.	<i>Blumea lacera</i> (Burm. f.) DC.	Asteraceae	Common	Jan. – March	Moist loving	Dicot
55.	<i>Sphaeranthus indicus</i> L.	Asteraceae	Less common	Dec. – April	Moist loving	Dicot
56.	<i>Laphangium luteo-album</i> (L.) Tzvelve	Asteraceae	Less common	Jan. – March	Moist loving	Dicot
57.	<i>Caesulia axillaris</i> Roxb.	Asteraceae	Common	Oct. – Feb.	Moist loving	Dicot
58.	<i>Enydra fluctuans</i> DC.	Asteraceae	Less common	Dec. – March	Aquatic	Dicot
59.	<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Common	Round the year	Moist loving	Dicot
60.	<i>Acmella paniculata</i> (Wall. ex DC.) R.K.Jansen	Asteraceae	Common	Sep. – March	Moist loving	Dicot
61.	<i>Wahlenbergia marginata</i> (Thunb.) A.DC.	Campanulaceae	Less common	Jan. – March	Semi aquatic	Dicot
62.	<i>Lobelia alsinoides</i> Lam.	Lobeliaceae	Less common	Sept. – Jan.	Moist loving	Dicot
63.	<i>Sphenoclea zeylanica</i> Gaertn.	Sphenocleaceae	Rare	Throughout the year	Aquatic	Dicot
64.	<i>Anagallis arvensis</i> L.	Primulaceae	Common	Jan. – March	Semi aquatic	Dicot
65.	<i>Mitrasacme indica</i> Wt.	Loganiaceae	Rare	Oct. – Dec.	Semi aquatic	Dicot
66.	<i>Canscora decussate</i> (Roxb.) Schult. & Schult.	Gentianaceae	Common	Sept. – Feb.	Semi aquatic	Dicot
67.	<i>Canscora diffusa</i> (Vahl) R.Br.ex Roem. & Schult.	Gentianaceae	Common	Oct. – June	Semi aquatic	Dicot
68.	<i>Hoppea dichotoma</i> Willd.	Gentianaceae	Common	Oct. – Dec.	Semi aquatic	Dicot
69.	<i>Nymphoides hydrophylla</i> (Lour.) Kuntze	Menyanthaceae	Common	July – Nov.	Aquatic	Dicot
70.	<i>Nymphoides indica</i> (L.) Kuntze	Menyanthaceae	Common	Throughout the year	Aquatic	Dicot
71.	<i>Nymphoides cristata</i> Roxb.	Menyanthaceae	Rare	July – Nov.	Aquatic	Dicot
72.	<i>Centaurium centaurioides</i> (Roxb.) S.R. Rao & Hemadri	Gentianaceae	Rare	Feb. – April	Aquatic	Dicot
73.	<i>Hydrolea zeylanica</i> (L.) Vahl	Hydrophyllaceae	Less common	Nov. – Feb.	Aquatic	Dicot
74.	<i>Coldenia procumbens</i> L.	Boraginaceae	Common	Nov. – May	Semi aquatic	Dicot
75.	<i>Cynoglossum lanceolatum</i> Forssk.	Boraginaceae	Common	June – Nov.	Moist loving	Dicot
76.	<i>Heliotropium indicum</i> L.	Boraginaceae	Common	May – Dec.	Moist loving	Dicot
77.	<i>Heliotropium ovalifolium</i> Forssk.	Boraginaceae	Less common	Feb. – June	Moist loving	Dicot
78.	<i>Heliotropium strigosum</i> Willd.	Boraginaceae	Less common	Aug. – Nov.	Moist loving	Dicot
79.	<i>Heliotropium supinum</i> L.	Boraginaceae	Less common	Nov. – March	Moist loving	Dicot
80.	<i>Ipomoea aquatica</i> Fossk.	Convolvulaceae	Common	Nov. - Feb.	Aquatic	Dicot

81.	<i>Ipomoea carnea</i> Jacq.	Convolvulaceae	Very common	Throughout the year	Semi aquatic	Dicot
82.	<i>Verbascum chinense</i> (L.) Santapau	Scrophulariaceae	Less common	Feb. – Nov.	Moist loving	Dicot
83.	<i>Mecardoniaprocumbens</i> (Mill.) Small	Plantaginaceae	Common	Nov. – March	Moist loving	Dicot
84.	<i>Veronica anagallis-aquatica</i> L.	Plantaginaceae	Less common	Jan. – April	Semi aquatic	Dicot
85.	<i>Centranthera tranquebarica</i> (Spreng.) Merr.	Orobanchaceae	Less common	Aug. – Oct.	Semi aquatic	Dicot
86.	<i>Centranthera indica</i> (L.) Gamble	Orobanchaceae	Less common	Aug. – Jan.	Semi aquatic	Dicot
87.	<i>Dopatrium junceum</i> (Roxb.) Buch.-Ham. ex Benth.	Scrophulariaceae	Common	Aug. – Dec.	Semi aquatic	Dicot
88.	<i>Lindernia crustacea</i> (L.) F. Muell.	Linderniaceae	Common	June – Jan.	Moist loving	Dicot
89.	<i>Lindernia ciliata</i> (Colsm.) Pennell	Linderniaceae	Common	Aug. – Dec.	Moist loving	Dicot
90.	<i>Lindernia parviflora</i> (Roxb.) Haines	Linderniaceae	Common	Nov. – March	Moist loving	Dicot
91.	<i>Lindernia procumbens</i> (Krock.) Philcox	Linderniaceae	Common	Sep. – March	Moist loving	Dicot
92.	<i>Lindernia multiflora</i> (Roxb.) Mukerjee	Linderniaceae	Less common	Aug. – Oct.	Moist loving	Dicot
93.	<i>Lindernia viscosa</i> (Hornem.) Merr.	Linderniaceae		Sept. – Nov.	Moist loving	Dicot
94.	<i>Lindernia anagallis</i> (Burm. f.) Penn.	Linderniaceae	Rare	Aug. – Jan.	Moist loving	Dicot
95.	<i>Lindernia antipoda</i> (L.) Alston	Linderniaceae	Rare	Aug. – Jan.	Moist loving	Dicot
96.	<i>Mazus pumilus</i> (Burm. f.) Steenis	Scrophulariaceae	Less common	Sept. – Feb.	Moist loving	Dicot
97.	<i>Bacopa monnieri</i> (L.) Wettst.	Scrophulariaceae	Common	Throughout the year	Moist loving	Dicot
98.	<i>Limnophila indica</i> (L.) Druce	Scrophulariaceae	Common	Dec. – Feb.	Aquatic	Dicot
99.	<i>Limnophila rugosa</i> (Roth) Merr.	Scrophulariaceae	Less common	Aug. – Dec.	Aquatic	Dicot
100.	<i>Utricularia aurea</i> Lour.	Lentibulariaceae	Less common	Oct. – Jan.	Aquatic	Dicot
101.	<i>Utricularia bifida</i> L.	Lentibulariaceae		Sept. – Oct.	Aquatic	Dicot
102.	<i>Utricularia stellaris</i> L.	Lentibulariaceae		Oct. – Feb.	Aquatic	Dicot
103.	<i>Hygrophila auriculata</i> (Schumach.) Heine	Acanthaceae	Very common	Sept. – Feb.	Semi aquatic	Dicot
104.	<i>Hygrophila polysperma</i> (Roxb.) Anders.	Acanthaceae	Common	March – July	Moist loving	Dicot
105.	<i>Hygrophila salicifolia</i> (Vahl) Nees	Acanthaceae	Less common	Feb. – Dec.	Semi aquatic	Dicot
106.	<i>Hygrophilaringens</i> (L.) Steud.	Acanthaceae	Less common	Sept. – March	Semi aquatic	Dicot
107.	<i>Hemigraphis hirta</i> (Vahl) T. Anderson	Acanthaceae	Less common	March – Aug.	Semi aquatic	Dicot
108.	<i>Rungia pectinata</i> (L.) Nees	Acanthaceae	Common	Sept. – April	Moist loving	Dicot
109.	<i>Rungia repens</i> (L.) Nees	Acanthaceae		Dec. – March	Moist loving	Dicot
110.	<i>Justicia betonica</i> L.	Acanthaceae	Rare	Nov. – Feb.	Moist loving	Dicot
111.	<i>Justicia procumbens</i> L.	Acanthaceae	Rare	July – Nov.	Moist loving	Dicot
112.	<i>Dipteracanthus patulus</i> (Jacq.) Nees	Acanthaceae	Common	Feb. – Dec.	Moist loving	Dicot
113.	<i>Ruellia tuberosa</i> L.	Acanthaceae	Common	Aug. – Dec.	Moist loving	Dicot
114.	<i>Lipia alba</i> (Mill.) Br. ex Britton & Wilson	Verbenaceae	Less common	Feb. – Oct.	Moist loving	Dicot
115.	<i>Phyla nodiflora</i> (L.) Greene	Verbenaceae	Less common	Throughout the year	Moist loving	Dicot
116.	<i>Platostoma hispidum</i> (L.) A.J. Paton	Lamiaceae	Rare	Sept. – Oct.	Moist loving	Dicot
117.	<i>Alternanthera paronychioides</i> A. St.-Hil.	Amaranthaceae	Less common	July – Nov.	Moist loving	Dicot
118.	<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	Amaranthaceae	Very common	April – Aug.	Aquatic	Dicot
119.	<i>Alternanthera sessilis</i> (L.) R. Br. ex DC.	Amaranthaceae	Very common	Throughout the year	Moist loving	Dicot
120.	<i>Alternanthera pungens</i> Kunth	Amaranthaceae		Throughout the year	Moist loving	Dicot

121.	<i>Chenopodium album</i> L.	Amaranthaceae	Common	Nov. – April	Moist loving	Dicot
122.	<i>Chenopodium murale</i> L.	Amaranthaceae	Common	Jan. – April	Moist loving	Dicot
123.	<i>Polygonum plebeium</i> R. Br.	Polygonaceae	Common	Jan. – June	Semi aquatic	Dicot
124.	<i>Persicaria glabera</i> (Willd.)M.Gomez	Polygonaceae	Less common	Sep. – March	Semi aquatic	Dicot
125.	<i>Persicaria barbata</i> (L.)H. Hara	Polygonaceae	Less common	Oct. – March	Semi aquatic	Dicot
126.	<i>Persicaria orientalis</i> (L.) Spach	Polygonaceae	Rare	Aug. – Oct.	Semi aquatic	Dicot
127.	<i>Persicaria pulchra</i> (Blume) Sojak	Polygonaceae	Less common	Oct. – March	Semi aquatic	Dicot
128.	<i>Persicaria hydropiper</i> (L.) Delabre	Polygonaceae	Less common	April – Sept.	Semi aquatic	Dicot
129.	<i>Persicaria bistorta</i> (L.) Samp.	Polygonaceae	Rare	June – July	Semi aquatic	Dicot
130.	<i>Rumex dentatus</i> L.	Polygonaceae	Less common	Dec. – June	Semi aquatic	Dicot
131.	<i>Peperomia pellucida</i> (L.) Kunth	Piperaceae	Common	July – Feb.	Moist loving	Dicot
132.	<i>Homonoia riparia</i> Lour.	Euphorbiaceae	Rare	May – Sept.	Moist loving	Dicot
133.	<i>Pouzolzia zeylanica</i> (L.) Benn.	Urticaceae	Rare	Oct. – Jan.	Moist loving	Dicot
134.	<i>Ceratophyllum demersum</i> L.	Ceratophyllaceae	Less common	Sep. – Feb.	Aquatic	Dicot
135.	<i>Ceratophyllum submersum</i> L.	Ceratophyllaceae	Rare	Oct. – Jan.	Aquatic	Dicot
136.	<i>Hydrilla verticillata</i> (L.f.) Royle	Hydrocharitaceae	Very common	Nov. – Jan.	Aquatic	Monocot
137.	<i>Nechamandra alternifolia</i> (Roxb. ex. Wight) Thwaites	Hydrocharitaceae	Less common	Aug. – Feb.	Aquatic	Monocot
138.	<i>Vallisneria spiralis</i> L.	Hydrocharitaceae	Less common	Nov. – March	Aquatic	Monocot
139.	<i>Ottelia alismoides</i> (L.) Pers.	Hydrocharitaceae	Rare	Sept. – Jan.	Aquatic	Monocot
140.	<i>Blyxa octandra</i> (Roxb.) Planch. ex Thwaites	Hydrocharitaceae	Nabi Talab	Aug. – Nov.	Aquatic	Monocot
141.	<i>Burmannia coelestis</i> D. Don.	Burmanniaceae	Rare	Aug. – Nov.	Semi aquatic	Monocot
142.	<i>Cheilocostus speciosus</i> (J.Koenig) C.D.Specht	Costaceae	Less common	June – Sept.	Moist loving	Monocot
143.	<i>Canna indica</i> L.	Cannaceae	Very common	Throughout the year	Moist loving	Monocot
144.	<i>Crinum asiaticum</i> L.	Amaryllidaceae	Less common	Throughout the year	Moist loving	Monocot
145.	<i>Crinum viviparum</i> (Lam.) R. Ansari & V.J. Nair	Amaryllidaceae	Less Common	Throughout the year	Moist loving	Monocot
146.	<i>Curculigo orchioides</i> Gaertn.	Hypoxidaceae	Less common	Oct. – Jan.	Moist loving	Monocot
147.	<i>Asphodelus tenuifolius</i> Cav.	Liliaceae	Less common	July – Dec.	Moist loving	Monocot
148.	<i>Eichhornia crassipes</i> (Mart.) Solms	Pontederiaceae	Abundant	April – Nov.	Aquatic	Monocot
149.	<i>Monochoria hastata</i> (L.) Solms	Pontederiaceae	Common	July – Nov.	Aquatic	Monocot
150.	<i>Monochoria vaginalis</i> (Burm.f.) C. Presl	Pontederiaceae	Common	July – Nov.	Aquatic	Monocot
151.	<i>Xyris pauciflora</i> Willd.	Xyridaceae	Rare	Oct. – Feb.	Semi aquatic	Monocot
152.	<i>Commelina longifolia</i> Lam.	Commelinaceae	Common	July – Nov.	Semi aquatic	Monocot
153.	<i>Commelina benghalensis</i> L.	Commelinaceae	Very common	July – Nov.	Semi aquatic	Monocot
154.	<i>Comellina erecta</i> L.	Commelinaceae	Common	March – Sept	Semi aquatic	Monocot
155.	<i>Commelina suffruticosa</i> Blume	Commelinaceae	Rare	Aug. – Oct.	Semi aquatic	Monocot
156.	<i>Cyanotis cristata</i> (L.) D. Don.	Commelinaceae	Common	Aug. – Jan.	Semi aquatic	Monocot
157.	<i>Murdannia edulis</i> (Stokes) Faden	Commelinaceae	Common	March – May	Semi aquatic	Monocot
158.	<i>Murdannia spirata</i> (L.) G. Bruckn.	Commelinaceae	Very common	Aug. – Dec.	Semi aquatic	Monocot
159.	<i>Murdannia nudiflora</i> (L.) Brenan	Commelinaceae	Very common	July – Nov.	Semi aquatic	Monocot
160.	<i>Murdannia vaginata</i> (L.) G. Bruckn.	Commelinaceae	Common	July – Nov.	Semi aquatic	Monocot



161.	<i>Tonningia axillaris</i> (L.) Kuntze	Commelinaceae		Aug. – Feb.	Semi aquatic	Monocot
162.	<i>Juncus prismatocarpus</i> J.Gay ex Laharpe	Juncaceae	Rare	Feb. – March	Semi aquatic	Monocot
163.	<i>Juncus bufonius</i> L.	Juncaceae	Common	Jan. – April	Semi aquatic	Monocot
164.	<i>Pandanus fascicularis</i> Lamk.	Pandanaceae	Rare	April – May	Semi aquatic	Monocot
165.	<i>Typha angustata</i> Bory & Chaub.	Typhaceae	Common	April – June	Aquatic	Monocot
166.	<i>Typha elephantiana</i> Roxb.	Typhaceae	Less common	Oct. – May	Aquatic	Monocot
167.	<i>Colocasia esculenta</i> (L.) Schott	Araceae	Abundant	July – Nov.	Semi aquatic	Monocot
168.	<i>Pistia stratiotes</i> L.	Araceae	Rare	May – Oct.	Aquatic	Monocot
169.	<i>Alocasia formicata</i> (Kunth) Schott	Araceae	Less common	May – Dec.	Semi aquatic	Monocot
170.	<i>Acorus calamus</i> L.	Acoraceae	Less common	Sept. – Dec.	Semi aquatic	Monocot
171.	<i>Lasia spinosa</i> Lour.	Araceae	Rare	Nov. – Feb.	Aquatic	Monocot
172.	<i>Lemna perpusilla</i> Torr.	Lemnaceae	Very common	May – Sept.	Aquatic	Monocot
173.	<i>Spirodela polyrrhiza</i> (L.) Schleid	Araceae	Very common	April – Nov.	Aquatic	Monocot
174.	<i>Wolffia globosa</i> (L.)Horkel ex Wimm.	Araceae	Less common	July – Oct.	Aquatic	Monocot
175.	<i>Sagittaria sagittifolia</i> L.	Alismataceae	Common	Oct. – March	Aquatic	Monocot
176.	<i>Sagittaria trifolia</i> L.	Alismataceae	Less common	Oct. – Feb.	Aquatic	Monocot
177.	<i>Butomopsis latifolia</i> (D. Don.) Kunth	Alismataceae	Less common	Sept. – Dec.	Aquatic	Monocot
178.	<i>Alismaplantago-aquatica</i> L.	Alismataceae	Rare	June – Aug.	Aquatic	Monocot
179.	<i>Limncharislava</i> (L.) Buchenau	Alismataceae	Rare	June – Aug.	Aquatic	Monocot
180.	<i>Najas graminea</i> Delile	Najadaceae	Less common	Aug. – Feb.	Aquatic	Monocot
181.	<i>Najas minor</i> All	Najadaceae	Rare	Sept. – Jan.	Aquatic	Monocot
182.	<i>Aponogeton natans</i> (L.) Engl. & K. Krause	Aponogetonaceae	Common	July – Dec.	Aquatic	Monocot
183.	<i>Aponogeton undulatus</i> Roxb.	Aponogetonaceae	Rare	July – Dec.	Aquatic	Monocot
184.	<i>Potamogeton nodosus</i> Poir.	Potamogetonaceae	Less common	Oct. – March	Aquatic	Monocot
185.	<i>Potamogeton crispus</i> L.	Potamogetonaceae	Less common	Jan – May	Aquatic	Monocot
186.	<i>Potamogetonpectinatus</i> L.	Potamogetonaceae	Rare	Nov. – Feb.	Aquatic	Monocot
187.	<i>Zannichellia palustris</i> L.	Potamogetonaceae	Common	Oct. – March	Aquatic	Monocot
188.	<i>Eriocaulon cinerum</i> R. Br.	Eriocaulaceae	Very common	Aug. – Nov.	Semi aquatic	Monocot
189.	<i>Eriocaulon quinquangulare</i> L.	Eriocaulaceae	Common	Sept. – Jan.	Semi aquatic	Monocot
190.	<i>Eriocaulon truncatum</i> Buch.	Eriocaulaceae		Nov. – Dec.	Semi aquatic	Monocot
191.	<i>Eleocharis dulcis</i> (Burm. f.) Trin. ex Hensch.	Cyperaceae	Common	Oct. – Dec.	Semi aquatic	Monocot
192.	<i>Eleocharis retroflexa</i> (Poir.) Urb.	Cyperaceae	Less common	Oct. – Nov.	Semi aquatic	Monocot
193.	<i>Eleocharis atropurpurea</i> (Retz.) J. Presl & C. Presl	Cyperaceae	Common	Sept. – Dec.	Semi aquatic	Monocot
194.	<i>Schoenoplectus mucronatus</i> (L.)Pala <i>Scirpus Mucronatus</i>	Cyperaceae	Common	July – Oct.	Semi aquatic	Monocot
195.	<i>Bolboschoenus maritimus</i> Subsp. affinis (Roth) T. Koyama <i>Scirpus affinis</i> Roth.	Cyperaceae	Less common	April – June	Semi aquatic	Monocot
196.	<i>Scirpus roylei</i> (Nees) R. Parker	Cyperaceae	Rare	Oct. – Feb.	Semi aquatic	Monocot
197.	<i>Schoenoplectiella supinus</i> (L.) Lye. <i>Scirpus supinus</i> L.	Cyperaceae	Rare	Oct. – Jan.	Semi aquatic	Monocot
198.	<i>Lipocarpha sphaelata</i> (Vahl.) Kunth. <i>Lipocarpha gracilis</i> (Rich ex Pers.) Nees	Cyperaceae	Less common	Aug. – Dec.	Semi aquatic	Monocot
199.	<i>Lipocarpha chinensis</i> (Osbeck) Kern	Cyperaceae	Less common	May – July	Semi aquatic	Monocot
200.	<i>Courtoisina cyperoides</i> (Roxb.) Sojak <i>Courtsia cyperoids</i>	Cyperaceae	Less common	Oct. – Feb.	Semi aquatic	Monocot

201.	<i>Kyllingatriceps</i> Rottb. <i>Cyperus triceps</i>	Cyperaceae	Common	Aug. – Nov.	Semi aquatic	Monocot
202.	<i>Kyllingamonocephala</i> Rottb. <i>Cyperus kyllingia</i> Endl.	Cyperaceae	Common	Aug. – Nov.	Semi aquatic	Monocot
203.	<i>Kyllingabrevifolia</i> Rottb. <i>Cyperus brevifolius</i> <i>Cyperus michelianus</i> Subsp. <i>pygmaeus</i> (Rottb). Asch. & Graebn	Cyperaceae	Common	April – June	Semi aquatic	Monocot
204.	<i>Cyperus alopecuroides</i> Rottb.	Cyperaceae	Rare	Aug. – Nov.	Semi aquatic	Monocot
205.	<i>Cyperus pygmaeus</i> Nutt.				Semi aquatic	Monocot
206.	<i>Pycneus flavidus</i> (Retz.) T. Koyama <i>Cyperus globosus</i>	Cyperaceae	Less common	Oct. – Feb.	Semi aquatic	Monocot
207.	<i>Queenslandiellahyalina</i> (Vahl) Ballard <i>Pycneus pumilus</i> (L.) Nees <i>Cyperus pumilus</i>	Cyperaceae	Rare	Aug. – Jan.	Semi aquatic	Monocot
208.	<i>Pycneus stramineus</i> C.B. Clarke <i>Cyperus stramineus</i>	Cyperaceae	Common	Sept. – Nov.	Semi aquatic	Monocot
209.	<i>Cyperus sanguineo-ater</i> Boeckeler <i>Cyperus sanguinolentus</i> Vahl.	Cyperaceae	Common	Aug. – Nov.	Semi aquatic	Monocot
210.	<i>Cyperus platystylis</i> R. Br.	Cyperaceae	Rare	July – Oct.	Semi aquatic	Monocot
211.	<i>Cyperus niveus</i> Retz.	Cyperaceae	Common	June – Oct.	Semi aquatic	Monocot
212.	<i>Mariscus umbellatus</i> Vahl <i>Cyperus pulchellus</i> R. Br.	Cyperaceae	Common	July – Nov.	Semi aquatic	Monocot
213.	<i>Cyperus compactus</i> Lam.	Cyperaceae	Common	July – Nov.	Semi aquatic	Monocot
214.	<i>Cyperus cyperoides</i> (L.) Kuntze	Cyperaceae	Common	July – Oct.	Semi aquatic	Monocot
215.	<i>Cyperus rotundus</i> L.	Cyperaceae	Very common	June – Jan.	Semi aquatic	Monocot
216.	<i>Cyperus articulatus</i> L. <i>Cyperus corymbosus</i> Rottb.	Cyperaceae	Very common	Sept. – Nov.	Semi aquatic	Monocot
217.	<i>Cyperus procerus</i> Rottb.	Cyperaceae	Less common	Sept. – Nov.	Semi aquatic	Monocot
218.	<i>Mariscus longibracteatus</i> Cherm. <i>Cyperus distans</i> L. f.	Cyperaceae	Common	Aug. – Nov.	Semi aquatic	Monocot
219.	<i>Cyperus nutans</i> Vahl.	Cyperaceae	Common	Sept. – Dec.	Semi aquatic	Monocot
220.	<i>Cyperus exaltatus</i> Retz.	Cyperaceae	Common	Aug. – Dec.	Semi aquatic	Monocot
221.	<i>Mariscus aristatus</i> (Rottb.) Tang & F.T. Wang <i>Cyperus squarrosus</i> L.	Cyperaceae	Common	Aug. – Oct.	Semi aquatic	Monocot
222.	<i>Cyperus betafensis</i> Cherm. <i>Cyperus cuspidatus</i> Kunth	Cyperaceae	Rare	Aug. – Nov.	Semi aquatic	Monocot
223.	<i>Cyperus iria</i> L.	Cyperaceae	Very common	Aug. – Jan.	Semi aquatic	Monocot
224.	<i>Cyperus difformis</i> L.	Cyperaceae	Very common	Aug. – Dec.	Semi aquatic	Monocot
225.	<i>Cyperus flavidus</i> Retz. <i>Cyperus haspan</i> L.	Cyperaceae	Common	Sept. – Feb.	Semi aquatic	Monocot
226.	<i>Cyperus tenuispica</i> Steud.	Cyperaceae	Rare	April – Dec.	Semi aquatic	Monocot
227.	<i>Cyperus amabilis</i> Vahl	Cyperaceae	Rare	Aug. – Oct.	Semi aquatic	Monocot
228.	<i>Cyperus eragrostis</i> var. <i>compactus</i> (E. Desv.) Kük. <i>Cyperus compressus</i> L.	Cyperaceae	Common	Aug. – Jan.	Semi aquatic	Monocot
229.	<i>Cyperus involucratus</i> Rottb. <i>Cyperus alternifolius</i>	Cyperaceae	Common Cultivated	July – Oct.	Moist loving	Monocot
230.	<i>Actinoscirpus grossus</i> (L. f.) Goetgh. & D.A. Simpson	Cyperaceae	Common	May – July	Aquatic	Monocot

231.	<i>Fimbristylis ovata</i> (Burm. f.) J. Kern	Cyperaceae	Rare	July – Sept.	Semi aquatic	Monocot
232.	<i>Fimbristylis ferruginea</i> (L.) Vahl <i>Fimbristylis ferrugines</i>	Cyperaceae	Less common	July – Sept.	Semi aquatic	Monocot
233.	<i>Fimbristylis schoenoides</i> (Retz.) Vahl	Cyperaceae	Common	Aug. – Oct.	Semi aquatic	Monocot
234.	<i>Fimbristylis falcata</i> (Vahl) Kunth	Cyperaceae	Rare	July – Sept.	Semi aquatic	Monocot
235.	<i>Fimbristylis miliaceae</i> (L.) Vahl	Cyperaceae	Common	Aug. – Dec.	Semi aquatic	Monocot
236.	<i>Fimbristylis quinquangularis</i> (Vahl) Kunth	Cyperaceae	Common	Aug. – Nov.	Semi aquatic	Monocot
237.	<i>Fimbristylis dichotoma</i> (L.) Vahl	Cyperaceae	Common	Aug. – Dec.	Semi aquatic	Monocot
238.	<i>Fimbristylis bisumbellata</i> (Forssk.) Bubani	Cyperaceae	Common	Oct. – Dec.	Semi aquatic	Monocot
239.	<i>Fimbristylis dipsacea</i> (Rottb.) C.B. Clarke	Cyperaceae	Rare	June – Sept.	Semi aquatic	Monocot
240.	<i>Fuirena ciliaris</i> (L.) Roxb.	Cyperaceae	Common	Dec. – Feb.	Semi aquatic	Monocot
241.	<i>Phragmites australis</i> (Cav.) Trin. ex Steud. <i>Phragmites karka</i> (Retz.) Trin. ex Steud.	Poaceae	Common	Sept. – Nov.	Aquatic	Monocot
242.	<i>Arundo donax</i> L.	Poaceae	Less common	Sept. – Feb.	Semi aquatic	Monocot
243.	<i>Eragrostis amabilis</i> (L.) Wight & Arn	Poaceae	Common	June – Nov.	Semi aquatic	Monocot
244.	<i>Eragrostis japonica</i> (Thunb.) Trin.	Poaceae	Common	July – Dec.	Semi aquatic	Monocot
245.	<i>Eragrostis nutans</i> (Retz.) Nees ex Steud.	Poaceae	Common	Aug. – Feb.	Semi aquatic	Monocot
246.	<i>Eragrostis uniolooides</i> (Retz.) Nees ex Steud.	Poaceae	Rare	Aug. – Nov.	Semi aquatic	Monocot
247.	<i>Eragrostiella bifaria</i> (Vahl) Bor	Poaceae	Common	Aug. – Nov.	Semi aquatic	Monocot
248.	<i>Dinebrachinensis</i> (L.) P.M. Peterson & N. Snow <i>Leptochloa chinensis</i> (L.) Nees.	Poaceae	Common	July – Nov.	Semi aquatic	Monocot
249.	<i>Oryza sativa</i> L.	Poaceae	Very common	Oct. – Dec.	Aquatic	Monocot
250.	<i>Hygroryza aristata</i> (Retz.) Nees ex Wight & Arn.	Poaceae	Less common	Oct. – Dec.	Aquatic	Monocot
251.	<i>Leersia hexandra</i> Sw.	Poaceae	Common	Oct. – Dec.	Aquatic	Monocot
252.	<i>Thysanolaena latifolia</i> (Roxb. ex Hornem) Honda	Poaceae	Less common	May – June	Semi aquatic	Monocot
253.	<i>Polypogon monspeliensis</i> (L.) Desf.	Poaceae	Less common	Jan. – June	Semi aquatic	Monocot
254.	<i>Sporobolus diandrus</i> (Retz.) P. Beauv.	Poaceae	Common	July – Nov.	Semi aquatic	Monocot
255.	<i>Coix lacryma-jobi</i> L.	Poaceae	Rare	Sept. – Oct.	Semi aquatic	Monocot
256.	<i>Pseudoraphis spinescens</i> (R. Br.) Vickery	Poaceae	Common	Aug. – Nov.	Semi aquatic	Monocot
257.	<i>Chaetochloa verticillata</i> (L.) Scribn. <i>Setaria verticillata</i> (L.) P. Beauv.	Poaceae	Common	July – Nov.	Semi aquatic	Monocot
258.	<i>Panicum curviflorum</i> Hornem.	Poaceae	Common	Aug. – Dec.	Aquatic	Monocot
259.	<i>Panicum miliaceum</i> L.	Poaceae	Rare	Aug. – Oct.	Semi aquatic	Monocot
260.	<i>Sacciolepis indica</i> (L.) Chase	Poaceae	Common	Sept. – Jan.	Semi aquatic	Monocot
261.	<i>Digitaria stricta</i> Roth	Poaceae	Rare	Sept. – Nov.	Semi aquatic	Monocot
262.	<i>Eriochloa procera</i> (Retz.) C.E. Hubb.	Poaceae	Common	Sept. – Dec.	Semi aquatic	Monocot
263.	<i>Urochloa ramosa</i> (L.) T.Q. Nguyen <i>Brachiaria ramosa</i> (L.) Stapf	Poaceae	Common	Aug. – Oct.	Semi aquatic	Monocot
264.	<i>Paspalum thunbergii</i> Kunth ex Steud. <i>Paspalum scrobiculatum</i> L.	Poaceae	Common	July – Dec.	Semi aquatic	Monocot
265.	<i>Setaria flavida</i> (Retz.) Veldkamp <i>Paspalidium flavidum</i> (Retz.) A. Camus	Poaceae	Common	Aug. – Nov.	Semi aquatic	Monocot

266.	<i>Echinochloa crusgalli</i> var. <i>frumentacea</i> (Link) W. Wight <i>Echinochloa frumentacea</i> Link	Poaceae	Rare	July – Oct.	Semi aquatic	Monocot
267.	<i>Echinochloa colona</i> (L.) Link	Poaceae	Common	July – Dec.	Aquatic	Monocot
268.	<i>Ischaemum rugosum</i> Salisb.	Poaceae			Semi aquatic	Monocot
269.	<i>Desmostachya bipinnata</i> (L.) Stapfa	Poaceae	Common	Aug. – Nov.	Semi aquatic	Monocot
270.	<i>Saccharum spontaneum</i> L.	Poaceae	Common	Sept. – Dec.	Semi aquatic	Monocot
271.	<i>Heteropogon contortus</i> (L.) P. Beauv. ex Roem. & Schult.	Poaceae	Less common	Sept. – Jan.	Semi aquatic	Monocot
272.	<i>Chrysopogon zizanioides</i> (L.) Roberty	Poaceae	Common	Aug. – Dec.	Moist loving	Monocot

×29.5) .The plants are listed as per the classification system of Bentham and Hooker (1862-1883).The specimens are deposited in the herbarium , Department of Botany, K.K.M. College, Pakur.

## RESULTS AND DISCUSSIONS

The intensive floristic survey of aquatic and semiaquatic Angiosperms of Jharkhand during 2014 to 2019, has revealed 272 species, belonging to 157 genera, distributed over 67 families of angiosperm. Out of 272 Aquatic and Semi aquatic angiospermic species 137 are monocotyledons belonging to 80 genera and 23 families where as 135 taxa are dicotyledons belonging to 77 genera and 44 families. The largest aquatic genus is *Cyperus* (20), followed by *Lindernia* and (8), *Fimbristylis* (8) each, *Perscaria* with (6), *Eragrostis* (5), *Murdania*, *Oldanlandia*, *Rotala*, *Heliotropium*, *Hygrophila*, *Alternanthera*, *Comellina* all with four species and whereas *Nymphaea*, *Ammania*, *Blumea*, *Eriocaulon*, *Nymphoides*, *Utricularia*, *Potamogeton*, *Eleocharis* with three species each.

In the study of Aquatic and Semi aquatic Angiosperms of Major Water Bodies of Jharkhand 28 families is represented by one species, twelve families with two species, six families with three species, Five families with four species, two families with five species and fourteen families with more than five species. A list of top fifteen dominated families alongwith their number of genus and species has been tabulated below. Similarly, 47 families are represented by one genus, six families by two

genus, two families by three genus, three family by four genus, two families by five genus, two families by six genus, one family by ten genus, one family by 15 genus and one family with twenty seven genus. Poaceae, Cyperaceae, Asteraceae, Acanthaceae, Araceae, Plantaginaceae, Hydrocharitaceae, Commelinaceae, Fabaceae, Alismataceae, Polygonaceae, Lythraceae, Boraginaceae and Amaranthaceae contributes to around 64.10% aquatic and semi aquatic angiospermic flora. A list of 15 most dominant family alongwith there number of genera and species have been given in table 1.

The total number of aquatic and semi aquatic angiospermic families, genera and species with their respective percentage studied from major water bodies of Jharkhand. The ratio of Dicotyledonsto Monocotyledons in case species, it is 1.9:1, in case of genera it is 0.9:1 and for the family it is 0.9:1. It is presented in table 11. A list of all the aquatic and semi-aquatic taxa of major water bodies along with their botanical name, families, availability, flowering and fruiting time, habitat and whether dicots or monocots of Jharkhand has been presented in TABLE- 1. List of 15 Dominant families with their no. of genera in aquatic and semi aquatic angiosperms of Jharkhand is shown in Bar -1 and Dominant families with their no. of species in aquatic and semi aquatic angiosperms of Jharkhand is shown in Bar-2.

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