

Survey of Aquatic plants of Kanker District (Uttar Bastar) Chhattisgarh, India

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Abstract

The present study deals with the documentation of aquatic macrophytes from Kanker district (North Uttar Bastar) of Chhattisgarh India. Kanker city is on the national highway NH-30. It lies between the two well developed cities of CG Raipur, capital of C.G. and Jagdalpur (Head quarter of Bastar). Kanker is situated within longitudes 20°6'-20°24' and latitudes 80°48'-81°48'. The total area of the district is 5285.01 square km. The district of Kanker owes its exceptional beauty. The climate of Kanker can be described as humid tropical. The summer season is very hot March and April are the hottest months with mean temperature 40°C and maximum temperature reaching up to 45°C. The winter is cool and the rainy season is full with water.

The study was carried out in four ponds of Kanker district namely Dandiya pond- Kanker, Bhatapara pond - Charama, Raja pond – Narharpur, Raja pond –Bhanupratapur. The selected ponds are always fully filled with water but some are affected from drought. The present investigation was conducted over a period of two years from June, 2014 to June, 2016. During the investigation the ponds were visited regularly and species growing there were recorded. The aquatic plant community comprises diverse group a macrophytes consisting of Angiosperms, Pteridophytes and Algae that occur seasonally or permanently in wet environment^{6,9}. During the present study, 41 macrophytic species were recorded, all species belonging to different families. Documentation and identification of plants will be helpful in planning for conservation of aquatic macrophytes diversity of the area. Ponds have been natural water source exploited by man for different purpose like domestic, agricultural & industrial uses, so resourceful ponds of the district are gradually degrading. The present study has been carried out for documentation and Identification of aquatic macrophytes of Kanker district (Uttar Bastar).

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Plants have evolved in many different ways of surviving in aquatic condition, some have thick wax or hairy leaves so that the leaves are un wet able that type of aquatic plants are hydrophytic plants, or Aquatic macrophytes. Aquatic macrophytes are adopted to live in water. These are aquatic photosynthetic organism large enough to be seen with naked eyes, that actively grow permanently or periodically submerged below, floating, or growing up through the water surface. According to Subramanyam⁸ aquatic plants are those species which normally stand in water and must grow for at least a part of their life cycle in water, either completely submerged or emerged, or those, whose seeds germinate in either the water phase or the substrata of a body of water and which must spent part of their life cycle in water. Ponds are very important to our life. They provide drinking water. During dry weather, ponds are very significant in their species composition and overall they often contribute more regional biodiversity.

Although water plants live on whole in a more equable and temperature climate than land plants yet they are liable in winter to deal the freezing of the water in which they occur. Some escape this trial by their habit of sinking to the bottom in the cold season, while other are able to withstand a temperature below freezing point for a long period, especially when they are in the seed phase. Water plant also helps keep the water cool and act as a food source for wildlife and they also serve the important function of helping to balance the ponds ecosystem.

The study of macrophytes is important

in order to understand the functioning of aquatic ecosystems. Most of the aquatic macrophytes may become a nuisance, when growing profusely. Eradication has become futile, in present state of energy crisis, therefore it is essential to look for other ways to utilize them for the betterment of mankind. In this respect many studies are under going throughout the country as well as abroad. Many works have been done by researchers on different aquatic plants but no studies have been conducted in these water bodies of the district. Relevant literature¹⁻¹⁵ has been consulted for the preparation of this manuscript.

Similar studies on Aquatic plants have been carried out by researchers in different parts of India. Earlier work on aquatic angiosperms by Moore¹¹, Arber¹, carried out his work on *Potamogeton* in relation to pond culture. Production of submerged aquatic plant communities of Doodhadhari Lake Raipur, (M.P.India) was carried out by Unni⁹. The Systematic studies on the aquatic Angiosperms of Cachar District of Assam was done by Malakar¹⁰. Saini *et. al.*,¹² carried out a study on Biodiversity of aquatic and semi aquatic plants. Growth form of macrophytes Salona Tal and its adjoining wetlands were worked by Kumar and Narain⁸.

Present study is planned to explore the water bodies of the Kanker district for the study of species diversity of aquatic vegetation. Commonly occurring species is presented in Table. Most of these macrophytes grow naturally and they have limited economic value in world.

Kanker is situated within longitudes 20.6-20.24 degree and latitudes 80.48-81.48

degrees. The total area of the district is 5285.01 square km. The region is land locked plateau, dotted with hills and valleys. Ponds, rivers and small water channel are the source of water. The weather of Kanker city is very good. The climate of Kanker can be described as humid tropical. The summer season is very hot March and April are the hottest months with mean temperature 40 and the winter is cool and the rainy season is full with water. The sample of selected macrophytes were collected from different water bodies of Kanker district, and deal with qualitative survey of species. Selected ponds are namely Dandiya pond- Kanker, Bhatapara pond- Charama, Raja pond-Narharpur, Raja pond-Bhanupratapur. The selected ponds is well protected with trees and houses. All ponds are always full fill with water but some are affected from drought. The aquatic plant typically can be separated into categories

wised on their specific characteristic. During the survey, The plants are found in above mentioned ponds were collected, and photographed and identified. The field survey is done dual in every month. The species were identified with the help of inhabitants and identified by relevant literature *i.e.*, Flora of Hooker⁵, Vol -I to VII Flora of M.P. and Bor⁴, The grasses of Burma, Ceylon, India and Pakistan.

The present study focuses on aquatic macrophytes diversity of Kanker district (Uttar Bastar) of Chhattisgarh. Selection of ponds for collection of plants has been done as per the richness of species. Aquatic macrophytes are investigated during June 2014 to June 2016 after screening aquatic macrophytes have been identified and classified. During the present study, 41 macrophytic species belonging to different families have been reported from four



Fig. - Study area Map in Kanker District: The Map indicates the locality of field study.

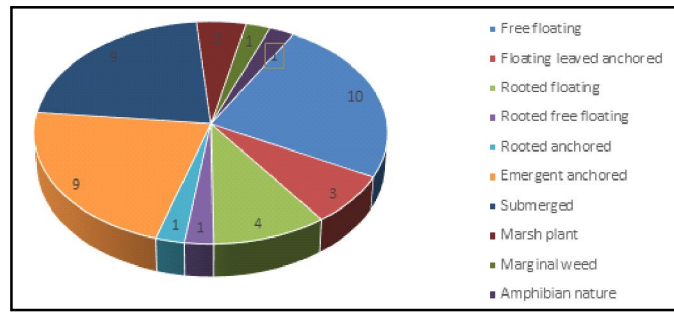
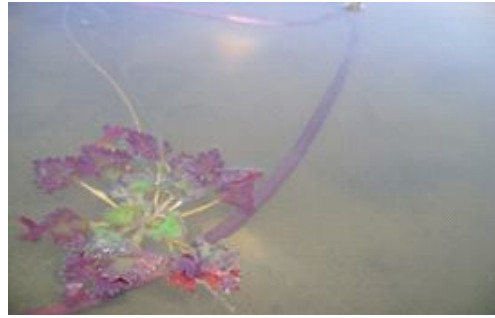


Figure - Analysis data of life form recorded from different region of ponds



Ottelia alismoides (Hydrocharitaceae)



Trapa bispinosa (Trapaceae)



Polygonum sps. (Polygonaceae)



Utricularia sps. (Lentibulariaceae)



Rotala malabarica (Lythraceae)



Nymphoides indica (Menyanthaceae)

Table-1. Occurrence and distribution of macrophytic species in four Ponds in Kanker District

S.N.	Name of Aquatic plant	Family	Habitat	Dandi yapond Kanker	Bhata- para pond Char- ama	Raja- para pond Bhanu pratapur	Rajapa ra pond Narah- apur
ANGIOSPERM							
1	<i>Altenanthera sessilis</i> L.	Amaranthaceae	Rooted anchored	+	+	+	+
2	<i>Alisma plantago aquatica</i> L.	Alismataceae	Emergent	+	-	-	-
3	<i>Bergia cepensis</i> L.	Elatinaceae	Emergent anchored	+	-	+	-
4	<i>Caltha palustris</i>	Ranunculaceae	Marsh plant	+	+	+	-
5	<i>Cyperus haspan</i> L.	Cyperaceae	Emergent anchored	-	+	+	+
6	<i>Cyperus rotundus</i> L.	Cyperaceae	Emergent anchored	-	+	+	+
7	<i>Eleocharis</i> sp. R.Br.	Cyperaceae	Emergent anchored	-	+	+	+
8	<i>Cynodon dactylon</i> L.	Poaceae	Emergent	-	+	+	+
9	<i>Eichhornia crassipes</i> (Mart.) Solms	Pontederiaceae	Free floating	+	+	+	+
10	<i>Hydrilla verticillata</i> Casp.	Hydrocharitaceae	Submerged	+	+	+	+
11	<i>Hygrophila spinosa</i> L.	Acanthaceae	Emergent anchored	-	+	-	-
12	<i>Ipomoea aquatica</i> Forsk.	Convolvulaceae	Submerged	+	+	+	+
13	<i>Jussiaea repens</i> L.	Onagraceae	Fee floating	+	+	+	-
14	<i>Lemna minor</i> L.	Araceae	Submerged	+	+	+	+
15	<i>Lemna trisulca</i> L.	Araceae	Submerged	+	+	+	+
16	<i>Myriophyllum indicum</i> L.	Haloragaceae (Water milfoil family)	Submerged	+	+	+	+
17	<i>Nelumbo nucifera</i> Gaertn.	Nelumonaceae	Rooted floating	+	+	+	+
18	<i>Nymphoides indicum</i> L.	Gentianaceae	Rooted floating	+	+	+	+
19	<i>Nymphaea malabarica</i> L.	Nymphaeaceae	Floating leavedan- chored	+	+	+	+

20	<i>Nymphaea alba</i> var L.	Nymphaeaceae	Floating leaved anchored	+	+	+	+
21	<i>Nymphaea nouchalli</i> Burm.f.	Nymphaeaceae	Free floating Floating	+	+	+	+
22	<i>Ottelia alismoides</i> Pers.	Hydrocharitaceae	leaved anchored	+	+	+	+
23	<i>Eclipta prostrata</i> L.	Asteraceae	Emergent anchored	+	+	+	-
24	<i>Pistia stratiotes</i> L.	Araceae	Free floating	+	+	+	+
25	<i>Rotala malabarica</i> Pradeep et al.,	Lythraceae	Emergent anchored	+	+	+	+
26	<i>Sagittaria</i> sp. L.	Alismataceae	Submerged	+	+	+	+
27	<i>Scripus articulatus</i> L.	Cyperaceae	Emergent anchored	+	+	+	+
28	<i>Trapa bispinosa</i> Roxb.	Trapaceae	Free floating	+	+	+	-
29	<i>Trapa quadrispinosa</i> Roxb.	Trapaceae	Free floating	+	+	+	-
30	<i>Typha angustata</i> Bory & Chaub.	Typhaceae	Marginal weed.	-	-	+	-
31	<i>Acorus</i> sp. L.	Acoraceae	Wetland plant	-	+	+	-
32	<i>Commelina benghalensis</i> L.	Commelinaceae	Amphibian nature	+	+	+	+
33	<i>Utricularia</i> sp.	Lentibulariaceae	Rooted floating	+	+	+	+
34	<i>Ceratophyllum demersum</i> L.	Ceratophyllaceae	Rooted free floating	+	+	+	+
35	<i>Polygonum barbatum</i> L.	Polygonaceae	Submerged	+	+	+	+
36	<i>Potamogeton natans</i> L.	Potamogetonaceae	Submerged herb	+	+	+	-
37	<i>Potamogeton crispus</i> L.	Potamogetonaceae	Submerged herb	-	-	-	-
Pteridophyta							
38	<i>Azolla pinnata</i> R.Br.	Salviniaceae	Free floating	-	+	+	-
39	<i>Salvinia natans</i> L.	Salviniaaceae	Free floating	-	+	-	-
40	<i>Marsilea quadrifolia</i> L.	Marsileaceae	Rooted floating	+	+	+	+
Algae							
41	<i>Chara</i> sp.	Characeae	Free floating	+	+	+	+

+ = Present.

- = Absent.

ponds of Kanker district (Uttar Bastar), Chhattisgarh India (Table-1). The *Eichhornia crassipes* and *Pistia* species is found in abundance in Dandia ponds of Kanker, they are removed from pond at definite interval. Two species *Ipomoea aquatica*, *Marsilea quadrifolia* both are found in summer season in more abundant condition and heavily eaten by local people by this area (Table 2). The aquatic macrophytic species occurring totally depend upon weather condition. The principal factor controlling the distribution of aquatic plants is the depth and duration of flooding. In Monsoon the most beautiful flower *Nelumbo nucifera blooris*. *Hydrilla verticillata*, *Ceratophyllum demersum* and *Utricularia* are always found in all four selected ponds in Kanker district.

Table-2. Occurrence of different habit forms of macrophytic in four ponds.

Habit Form	Number of species in pond
Free floating	10
Floating leaved anchored	3
Rooted floating	4
Rooted free floating	1
Rooted anchored	1
Emergent anchored	9
Submerged	9
Marsh plant	2
Marginal weed	1
Amphibian nature	1

The present investigation was conducted over a period of two year from June 2014 to June 2016. Study deals with qualitative survey of macrophytes. Out of aquatic plants recorded,

37 angiosperm species of aquatic macrophytes belongs to 27 families, 3 pteridophytes of aquatic macrophytes belongs to 2 families and 1 algae (*Chara*) species belong to one family (Characeae) observed from four different ponds.

The main aim of the present study was to search the useful aquatic plants in four ponds of Kanker district which help in documentation, identification and data update for future. Documentation of plants will be helpful in planning of conservation of aquatic macrophytes and diversity of macrophytes in the area.

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