

Ethnobotanical Survey of Aquatic Plant in Kanker City Chhattisgarh (India)

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Abstract: Present study deals with Ethnobotanical survey of aquatic plants of Kanker city, the present work conducted to identify nature of macrophytes that found in ponds of Kanker city. Kanker a dense forest area named Dandkarayana. Kanker town is on the national highway NH-30. It lies between the two well developed cities of Raipur (capital of C.G.) and Jagdalpur (Head quarter of baster.) River Doodhnadi flow through the city. Kanker city is made up of small pocked of hills. The main ponds of Kanker city are Dandiya talab, Mahurband talab, Raja talab and sheetla talab. Ethnobotany is the study of which people of particular culture and reason make use of indigenous plants in other words ethno botany suggested the fundamental role of plants in different culture including medicinal purposes. The occurrence of various habit from of aquatic macrophytes growing in the ponds of Kanker city namely Dandiya, Raja talab were studied during survey. The study period was from July 2014- June 2015. The ponds water surface is not related to aquatic macrophyte species the margin are of pond shows large number of plants species. Total 17 macrophyte are identified according to our survey report namely *Nelumbo nucifera* –(*Nymphaeaceae*) *Ipomoea aquatica* and *Marsilea quadrifolia*, *Trapa bispinosa*, *Nelumbo*, *Sagittaria*, *Typha*, *Azolla*, *Pistia*, *Eichhornia sps*, *Ceratophyllum demersum*-, *Commelina benghalensis*, *Hydrilla verticillata*–. In this paper the ethnobotany of aquatic plants is presented. Here ethno-botanically interesting plants are given with their uses. Total 17 Aquatic plants have been reported in this paper.

Keywords: Ethnobotany, Kanker, Aquatic plants, Macrophyte, Dandkarayana.

I. INTRODUCTION

There is a dense forest area named Dandakaranya and also known as Kanker. Kanker town is situated on the national highway NH 30. It lies between the two well developed cities of Chhattisgarh Raipur(capital of Chhattisgarh) and Jagdalpur (Head quarter of Baster).

River Doodhnadi flow through the city. Kanker city is made up of small pocked of hills. The main pond of Kanker city is Dandiya, Raja talab, Mahurbandpara talab and Sheetla talab The geographical distributions of vascular macrophytes are intriguing and anomalous. Aquatic plant would tend to be locally distributed in any land mass.

Aquatic macrophytes are limited economic value in modern world generally herbaceous nature most of species serve of good sources of food to mankind and animals. As sources of food they have been largely discarded. It has also been investigated that as sources of food and their benefit to man resides mainly in wild life conservation practices where they provide food for water fowl and other animals. A large number of aquatic plants are very important for medicine uses as well as source of food for people.

In India several decorative water plants have been held in the highest esteem since the earliest time. The beautiful flower lotus is reflected in their frequent portrayal on fabric and tapestries Pottery and metal work. *Nelumbo nucifera* has always had especial significances.

Aquatic macrophytes have been studied by many of the workers in India as well as in abroad. Some of the representative references on aquatic plants are being quoted here. Biswas and Calder(1937). Bhagyaleena and Gopalan (2012), Billore, and Vyas (1981). Verma, Pant & Hanfi (1985), Ambashta (1992), Sambamurty (2005-06), Sinha and Naik, (1997). Subramanyam ,(1962). Mandal and Mandal (2001) and Dutta et al. (2002). Verma and Khan (2014). Das, Mondal, and Mandal (2016). All workers were made aquatic and wetland flora of different state in India.

The occurrence of various habit forms of Aquatic macrophytes growing in the pond of Kanker city namely Dandiya talab and Raja talab. The pond water surface is not related to aquatic macrophyte species the margin area of pond showing large number of species. Aquatic plants are of limited economic value in modern world they have major role in economic important they also have vital role in human welfare as well as source of food for human beings. The entire Kanker city found four major pond they all ponds consisting large number of aquatic macrophyte which are used on edible food for the people.

II. STUDY AREA AND CLIMATE

Kanker is located at 20-27 ° N and 81.49° E. It has average elevation of 388 meters and climate of Kanker is of predominantly a Monsoon the May month is hottest and December month is very coldest. Annual average rain of the district is 1492 mm, 90% of which fall during the period of June to October. The average annual rainfall over last six years shows that it is highly fluctuating within the district.

The study area Map in Kanker city -



III. MATERIAL & METHOD

Ethnobotanical survey was done in the months of July 2014- June 2015. In two ponds of Kanker city namely Dandiya, and Raja talab.

The sample were collected from different ponds of Kanker city. The species included in this study were either aquatic macrophyte or phytoplankton (chara) in the pond. The plants species where collected in their flowering, fruiting and fully mature stages. The sample of selected macrophyte were collected from different pond of Kanker city during survey of aquatic plants and also collecting information about macrophyte from local people of that areas and photographed at the site during survey to prosecute the studies in systematic and logical manner and then identified and are confirmed with the help of standard literature.

Here some common aquatic plant are included, their field survey was dual in every month the species are identified with the help of inhabitants and also by relevant literature and the some aquatic plants are including have become of their edible value was confirmed. They are good source for organic material and also help to oxygen supply in the pond bottom. For ethnobotanical survey visits to local markets, haats, etc in different seasons and festivals had been done. Plants were identified with the help of flora of British India (Hooker 1872) and flora of Raipur, Durg and Rajnandgaon(Verma et al 1985).

IV. RESULT & DISCUSSION

In the present study total 17 plant species were identified of which 5 are free floating, 3 are rooted marginal, 6 plant species are submerged, 2 are anchored floating while 1(*Commelina benghalensis*) is amphibian in nature. Maximum use value of leaves (43%) of plant studied was found, followed by Rhizome (22%), stem (14%), fruits (14 %) and least was found of petiole (7%). The pond is of macrophyte species and the result may seem counter intuitive as species should increase with habitat area. The ethnobotanical survey and experience of people of the place gave some important

information about aquatic plants. They used different kinds of aquatic plants for their daily life, such as a edible plants, medicinal plants, fodder, ornamentals plants and water gardening plants etc. In the entire Kanker city there are four major ponds, they all consist a large number of aquatic macrophyte which are used as edible food. *Nelumbo nucifera* (kamal kakri/dhense) stem are eaten by the locality and richly available in the local market. Aquatic plants are used in religious ceremony and architecture. Hence the information in this work is totally based on primary sources which are given by local people of the Kanker city areas. During the investigations species have been recorded from two pond of Kanker city.

Observation table 1- List of aquatic plant found in Kanker city ponds Dandiya & Raja talab.

NO.	NAME OF PLANT	FAMILY	HABIT	USES
1.	<i>Acorus calamus</i> L	Acoraceae	Rooted aquatic	Rhizome is used as flavour for pipe tobacco, clear out bowel, relieving constipation.
2.	<i>Azolla pinnata</i> R. Br.	Salviniaceae	Free floating	Green compost for rice cultivation
3.	<i>Ceratophyllum demersum</i> L.	Ceratophyllaceae	Submerged rootless free floating	Used to diarrhoea, dysentery and fever.
4.	<i>Commelina benghalensis</i> L.	Commelinaceae	Amphibian nature	Used as animal fodder and also eaten by humans as vegetables. Also used to treat burns and leprosy.
5.	<i>Eichhornia</i> sps. Kunth	Pontederiaceae	Free floating	Waste water treatment, fibre use for rope
6.	<i>Hydrilla verticillata</i> (L.f.) Royle	Hydrocharitaceae	Submerged rootless free floating	Dried part are used as burn fire, and also uses as treatment of abscesses, boil and wound
7.	<i>Ipomoea aquatica</i> Forsk.	Convolvulaceae	Rooting marginal floated	Uses as vegetables, their young leaves and root are eaten
8.	<i>Lemna</i> sps Linn.	Araceae	Free floating	Source of animal feed for agriculture
9.	<i>Marsilea quadrifolia</i> L.	Marsileaceae	Free floating	Leaves used as vegetables
10.	<i>Nelumbo nucifera</i> Gaertn.	Nelumonaceae	Anchored floating	Fruit and Rhizome are eaten as vegetable
11.	<i>Nelumbo nouchali</i> (Water lilly)	Nymphaeaceae	Anchored floating	The spongy petioles and peduncles are cooked and eaten by the poor people.
12.	<i>Oryza sativa</i> L.	Poaceae	Submerged	It is the marshy aquatic plants, which is used as human food crop.
13.	<i>Pistia</i> sps. Linn.	Araceae	Free floating	Dried leaves are used for medicine and ornamental.
14.	<i>Polygonum</i> sp. Linn.	Polygonaceae	Marginal rooted	The shoots and roots are cooked as vegetable.
15.	<i>Trapa bispinosa</i> Roxb.	Trapaceae	Submerged	Consumed as fruit
16.	<i>Typha</i> sps. Linn.	Typhaceae	Submerged	rhizome and young shoot are eaten, leaves are plaited into ropes
17.	<i>Utricularia</i> sps. Linn.	Lentibulariaceae	Submerged rootless free floating	Dried leaves are used to make a medicinal tea. And also for treating swelling and to promote weight loss.

• *Acorus calamus* L. (Acoraceae) –rooted aquatic-Rhizome is used as flavour for pipe tobacco, clear out bowel, relieving constipation and abdominal colic.

• *Azolla pinnata* - (Salviniaceae) Free floating plant. (Singh 1977) - Azolla as a precious green compost for the rice cultivation, an increase of 30% to 38% in grain yield has been reported from field. It is used in bioethanol production. It is also a ornamental plant. Rhizomes are used in chronic diarrhoea and dysentery and in mental illness.

- *Ceratophyllum demersum* (*Ceratophyllaceae*)-submerged rootless free floating also known as Hornwort. Used for diarrhoea, dysentery and fever.
- *Commelina benghalensis* (*Commelinaceae*)- amphibious nature-Used as animal fodder and also eaten by humans as vegetables and also used as treat burns & indigestion with a juice produced from root.
- *Eichhornia sps* (*Pontederiaceae*) –free floating- Used in waste water treatment, fodder used in a small scale paper-making project. Fibre from stem is used to make ropes. Good source of cellulose.
- *Hydrilla verticillata* (*Hydrocharitaceae*)-submerged rootless free-floating- Dried part are used as burn fire, and also uses as treatment of abscesses, boil and wound.
- *Ipomoea aquatica* – *Convolvulaceae* (rooting marginal floated) - It is common throughout Kanker pond and tank .The young leaves and shoots and roots are used as vegetables. It is grown for their green herbaceous foliage. Use: Dry juice use as purgative (used to treat and prevent constipation).
- *Lemna sps* (*Araceae*)-free-floating -Source of animal feed for agriculture.
- *Marsilea quadrifolia*- free floating- (water ferns) - (*Marsileaceae*)
leaves are used as a leafy vegetable in this region.
- *Nelumbo nouchali*- (water lily) – (*Nymphaeaceae*) **Anchored floating.**
- *Nelumbo nucifera* –(*Nelumbonaceae*) **Habitat - Anchored floating.** Perennial aquatic herb with creeping stout, branching root stock, flower floating, fruits a seed. *Nelumbo nucifera* has been widely cultivated and its fruits and rhizome used in variety of cooking and fresh dishes. Carpels of *Nelumbo nucifera* are eaten raw, roasted or boiled, sometimes grounded into flour by local people of Kanker District.
- *Oryza sativa* – (*Poaceae*) **submerged-** It is the marshy aquatic plants, which is used as human food crop.
- *Pistia* (*Araceae*) -free floating – Used in aquarium to provide cover for small fish and they are also ornamental, commonly known as ‘Jal Gulab’.
- *Polygonum sp.* (*polygonaceae*) –marginal rooted- Grow on marshy places or margins of water.The spongy petioles and peduncles are cooked and are eaten by the poor people. Rhizomes are used in dyspepsia and dysentery. Widely used as ornamental plant.
- *Trapa bispinosa* (*Trapaceae*)- **submerged-** *Trappa bispinosa* are used in this locality as a fruit, which is a one seeded nut, and eaten either raw or cooked and grounded into flour. Different type of dishes is prepared with the flour. The edible portion being the starchy cotyledon. Rich source of Iodine. They are consumed during fasting and are offered to Goddess Laxmi.
- *Typha* (*Typhaceae*)- **submerged-** rhizome and young shoot are eaten, leaves are plaited into ropes.
- *Utricularia sps.* (*Lentibulariaceae*)-submerged rootless free floating- Also called Bladderworts, genus of carnivorous plants. Dried leaves are used to make a medicinal tea. And also for treating swelling and to promote weight loss.

Fig 1: *Azolla pinnata*Fig 2: *Ipomoea aquatica*



Fig 3: *Nelumbo nucifera*



Fig 4: *Nelumbo nucifera* : fruit



Fig 5: *Nelumbo nouchali*



Fig 6: *Marsilea quadrifolia*



Fig 7: *Trapa bispinosa*



Fig 8: *Eichhornia sps*



Fig 9: *Pistia sps*



Fig 10: *Hydrilla verticillata*



Fig 11: *Lemna* sps



Fig 12: *Acorus calamus* L.



Fig 13: *Commelina benghalensis*



Fig 14: *Utricularia* sps



Fig 15: *Ceratophyllum demersum*



Fig 16: *Polygonum* sps

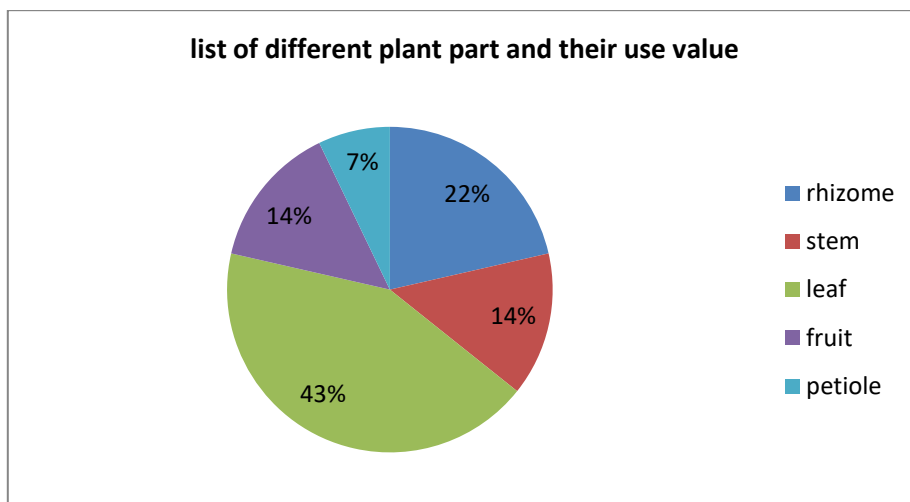


Fig 17: Chart showing use value of plant with different plant parts

V. DISCUSSION & CONCLUSION

The present study provides comprehensive data of aquatic plant collected from two pond of Kanker city. 17 Species belongs to different families (Table 1). The study period from July 2014- to June 2015. The aquatic plants are recorded from water bodies which are considered as ethnobotanically important plants. Its species richness is found in month of July and till post monsoon. Conservation status of aquatic plant used for medicinal, food and ornamentals uses

Total 17 macrophyte are identified according to our survey report namely *Nelumbo nucifera* –(*Nelumbonaceae*) used in Laxmi puja and Durga puja specially in ashthmi as sacred flower, *Ipomoea aquatica* and *Marsilea quadrifolia* as leafy vegetable, *Trapa bispinosa*- as a fruits edible source of iodine, also used in religious ceremonies. Aquatic plants like *Nelumbo*, *Sagittaria*, *Typha*, *Azolla*, etc. are used as an ornamentals plants. *Eichhornia sps* is used in waste water treatment, fodder used in a small scale paper- making project. Fibre from stem is used to make the rope. *Azolla* is used as fodder for liver stock, as fertilizer in productions of biogas and bioethanol Lotus flowers have religious significance for Hindus and Buddhists. The lotus is also used for human consumption and is widely cultivated in China and India, mainly for its flowers. The fruits, seeds, rhizomes and stems of water lilies are also eaten in Kanker city by local people. So, everyone should take measures for the conservation of these resources of aquatic plants and related water bodies. Here in this work I found that, it is very clear that though aquatic plant posse's significant ethnobotanical value, so common man needs to know about the aquatic plant.

For this purpose an attempt has been made to categorise the aquatic plant with their economic importance by the local people of Kanker city.

ACKNOWLEDGMENT

We are thankful to Mrs. Poonam Dewangan (Research scholar) D.B. PG College Raipur C.G and Miss Pushplata for their sincere help in my work. We are also thankful to our Principal for providing his necessary facilities for this work and also thanks to Publisher, for his publication work.

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