ISSN : 0973-7057

# Biodiversity of aquatic flora in Raja bandh pond of Jamtara district of Jharkhand (India)

Hem Kant Jha,\*\* Bijay S.Singhb & Arvind Kr. Singhc

\*aDeptt. of Botany, Mahila Sandhya College, Jamtara(Jharkhand) India. <sup>b</sup>C.I.T. Tatisilwai, Ranchi (Jharkhand) India. <sup>c</sup>S. K. M. University, Dumka, Jharkhand

Received, 21st November, 2014; Revised: 20th December, 2014

**Abstract :** Raja Bandh is one of the most important and famous pond of Jamtara Notified Area with some mythological beliefs. Its aquatic habitat existence is of more than hundred years old. Aquatic flora are very important components of food web dynamics in most of the fresh water habitat. They not only maintain the components and balance of aquatic ecosystem but also play vital role in the field of human welfare. The present study compiles an account of biodiversity of aquatic flora in Raja Bandh pond of Jamtara district of Jharkhand. A field survey of the pond and its floristic study was carried out on regular intervals to describe the aquatic biodiversity. During the case study total 16 aquatic plants belonging to 15 families were identified and studied. The floristic data contains habitat , botanical name, vernacular name , family and a brief description of the plants.

Keywords: Raja Bandh pond, Aquatic flora, Jamtara, Aquatic ecosystem, Biodiversity.

## **INTRODUCTION**

Aquatic biodiversity can be defined as the number and abundance of species that live in any aquatic ecosystems. Biodiversity is not only the richness of species; but it is also the genetic variability with the multiple habitats and ecosystems in which these plants and animals live. Ecosystems contain both the living plants and animals and the nonliving elements (water, sunlight, soils) on which they depend. The greater biodiversity, ensure greater stability of an environment, and vice - versa. Conservation of rich diversity is also necessary for the discovery of new medicines and in reducing ozone and carbon-di-oxide per centage in the atmosphere. Biodiversity provides food , clothing , housing , medicines and spiritual nourishment to human beings (Kulshrestha, 2005)<sup>1</sup>. It will not be worthless to say that biodiversity acts as the key factor both for the environment and human life (Haines, 1978;

\*Corresponding author :

Naskar, 1990)<sup>2,3</sup>. We are solely dependent on a number of aquatic flora and fauna and their functional activities are essential for our survival. The potential of aquatic plants as food and feed has been emphasized by the several workers (Bhowmik *et al*, 2013, Verma, & Khan, 2014)<sup>4,5</sup>. They also participate in the process of biogeochemical cycle and in the process of sediment deposition (Bornette & Pujalon, 2011)<sup>6</sup>. Aquatic organisms are also being used for the processing of waste products.

There are many factors that can affect and change biodiversity within aquatic ecosystems. Increasing population and modern life styles has resulted extensive exploitation of the natural resources resulting into loss in biodiversity which has affected not only the physical environment but also the social, cultural and spiritual well being of human life. Aquatic biodiversity can experience a decline also due to loss or fragmentation of habitat, pollution or the introduction of an invasive species. Human activity and development have had an immense affect on biodiversity in all ecosystem types, and aquatic ecosystems are no exception.

Phone: 0

E-mail:

## Biospectra : Vol. 10(1), March, 2015, Spl. issue.

An International Biannual Refereed Journal of Life Sciences

Biodiversity as a whole, as well as specific species are dependent on healthy ecosystems for survival. Activities as described above can have devastating effects on local aquatic biodiversity, and can eventually result in specific species no longer existing in that area.

## **MATERIALS AND METHODS**

The samples were collected from Raja bandh pond of Jamtara district which was constructed more than hundred years ago by the ancestral king of Raja Ajit Singh. It is the pond having a historical background and even the family members of Raja Ajit Singh are unable to illustrate about its exact construction period. It is situated near around Newtown and Rajpalli area. Most of the natives of this locality are dependent on this water body for their daily needs. This water body is also used for fishing. Jamtara district lies between 23°102 and 24°052 north latitudes and 86°302 and 87°152 east longitudes. It is located at a lower altitude of Chhotanagpur Plateau. The present work is a part of regular visit of the research site , preferably at the interval of 15 - 20 days for collection and identification of plants for further study. Some of the native people of this locality like Mahadeo Ghiwar, Shirsashis, Kishore Razwar, Mahendra Soren, Anamika and Dr. Soumen Sarkar also assisted me much more in

identification of flora and to know their vernacular names.

During the survey , plants were collected , photographed and identified as per the rules and guidelines of Botanical Survey of India. They were dried and preserved by using standard herbarium techniques. Botanical names, common names, families, and floral characters were also recorded. Some stress was given on their economic importance also.

## **RESULTS AND DISCUSSION**

It is very clearly understood that biodiversity has great impact in all the aspects of ecological phenomenon and also for sustainable life support. But today declining biodiversity has been a major and ongoing environmental dilemma.

However the research site is very populous and old one, so it is very rich and ideal habitat for aquatic flora and shows greater range of biodiversity. During the present study total 16 species of aquatic plants belonging to 15 families were recorded. Out of which 10 species were found to be marginal, 4 emersed, 1 floating while 1 to be submerged. The survey includes study of 15 angiospermic plants and one pteridophytic member. The brief descriptions of the flora is summarised in the table given below. (Table – I).

SI. No	Botanical Name	Local Name	Habitat	Plant description
1.	Oxalis corniculata ( Oxalidaceae )	Amrul, Tinpatta	Marginal	Small, prostrate or sub - erect trailing herb ,rooting at the nodes, leaves trifoliate petiolate , leaflets obovate, emarginated sparsely hairy , flowers soliatary, yellow in simple umbel, stamens 10, alternately long and short, connate at the base.
2.	Oldenlandia corymbosa ( Rubiaceae)	Khetpapra	Marginal	Annual, glabrous and prostrate herb; dichotomously branched, rooting at the nodes ; leaves linear, lanceolate; flowers white, 1 or 2 at each node; capsules didynamous, seeds angular.
3.	<i>Hygrophila auriculata</i> ( Acanthaceae)	Kullikhara	Marginal	Erect marshy and annual undershrubs with axillary spines; stem angular in young stage; leaves sessile, oblong, lanceolate with long sharp spines at each node; flowers bright blue or bluish purple.

Table I :- Aquatic diversity in Raja Bandh Pond of Jamtara district (Jharkhand)

Table continued.....

# Jha et al :Biodiversity of aquatic flora in Raja bandh pond of Jamtara district of Jharkhand (India)

Table continued .....

4.	Alternanthera sessilis ( Amaranthaceae)	Gurundi	Marginal	Prostrate, glabrous herbs with roots at the nodes; leaves elliptic, linear and oblong; flowers white, shining in small axillary clusters; tepals almost equal; stamens 3 – 5, alternating with staminodes; utricles obcordate, compressed and one seeded.
5.	Ranunculus scleratus (Ranunculaceae)	Jaldhania	Marginal	Erect, annual herb, glabrous, stem succulent, hollow deeply furrowed. leaves simple, sessile, radial, reniform, long, petiolate, tri-partite. Flowers small, white or yellowish white numerous and terminal. Calyx reflexed. Petals oblong with a basal pit or scale. Stamens indefinite.
6.	Ammannia baccifera (Lythraceae)	Dadmari	Marginal	Annual , erect , glabrous , marshy herb ; stem quadrangular and hard ; leaves opposite , decussate almost sessile , lamina narrow at the base ; flowers deep red in dense axillary cyme ; sepals 4 , petals minute or absent , stamens 4 ; fruits globose and irregulary dehiscing.
7.	Spillanthes acmella (Asteraceae)	Akarkara	Marginal	A herb with long week stems creeping at the base. sometimes erect or ascending ; leaves simple , petiolate , opposite , ovate ; pretty yellow heads with very prominent centre.
8.	<i>Eclipta prostrata</i> (Asteraceae)	Bhingraj	Marginal	Prostrate or ascending annual herb; often rooting at nodes; stem hairy; leaves opposite, sessile, oblong – lanceolate or linear – lanceolate, entire or serrate; heads white, heterogamous; pappus usually absent.
9.	Rumex dentatus ( polygonaceae)	Jangli palak	Marginal	Erect, annual herbs, 20 to 25 cm high; leaves oblong, obtuse, petiolate; flowers green in leafy or leafless whorls; perianths in 2 whorls $(3 + 3)$ , toothed.
10.	Ipomea aquatica (Convolvulaceae)	Kalmisag	Emersed	Floating or trailing, amphibious herbs, rooting at the nodes stems fistular and soft. Leaves elliptic or ovate-oblong, flowers pale pink with a dark purple eye, solitary or 2-5 flowered peduncled cymes. Sepals unequal. Petals funnel shaped. Capsules globose.
11.	<i>Nymphoides indicum</i> (Menyanthaceae)	Kumudni	Emersed	. Rooted, rhizomatous, floating herbs. Leaves leathery, orbicular-peltate, ; veins arising from the base of lamina, flowers dimorphic, white with yellow centre, in clusters at the base of the petiole. Sepals and petals both ovate lanceolate. Capsules subglobose. Seeds numerous.
12.	<i>Centella asiatica</i> ( Apiaceae )	Thankuni Gotakola	Emersed	Creeping herbs with long roots at nodes ; stems slender , creeping stolons , green in colour ; leaves long stalked , petioles long ; flowers minute , white or pinkish white in compound umbels ; fruits globose, seeds brown and oblong.
13.	Ludwigia adscendens (Onagraceae)	Labangi	Emersed	Long stem with obovate leaves, flowers whitish or pale creamy coloured, sepals lanceolate, seeds smmoth.

Table continued.....

## Biospectra : Vol. 10(1), March, 2015, Spl. issue.

An International Biannual Refereed Journal of Life Sciences

Table continued .....

14.	<i>Utricularia aurea</i> (Lentibulariaceae)	Jhangi	Submerge d	Stolons much branched and submerged ; leaves simple , whorled at top and spiral along the stem , segments filiform , small sub- globose bladder at the base of each pinna ; flowers yellow , in 3 to 8 flowered serial recemes , petals 2 ; capsules globose seeds narrowly winged.
15.	Eichhornia crassipes (Pontederiaceae)	Jalkumbhi	Floating	Leaves smooth glossy bright green ,broad and large , flowers violet blue , roots free and fibrous.
16.	Marselia quadrifolia (Marseliaceae)	Susni saag	Marginal	Rhizomes branched at leaf base, leaves showing circinate venation, petioles long and week with 4 leaflets of equal size.

Among the above mentioned members *M.quadrifolians*, *C.asiatica* and *I.aquatica* are used very frequently by the local residents both as staple food as vegetables and they all have significant ethnomedicinal role too. It can truly be said that these aquatic flora have very significant role in human life as they have been used as medicine since ancient rigvedic period. It will not be worthless to say that in addition to medicines and food, these plants play very important role in various fields like production of biogas or bioenergy, waste water treatment, compost production, fish culture and in making our nature pollution free.

# As we know water plants are our aquatic heritage and sustaining their biodiversity will be our legacy to future generation also. It is very important to conserve the aquatic flora for healthy and pollution free atmosphere but the impact of developmental activity and human beings changes our aquatic habitat has caused massive reduction in our aquatic biodiversity, so steps should be taken for their conservation. Since Jharkhand in general and Jamtara district in particular is very rich in having ponds and other water bodies, so there could be much more possibility of biodiversity of aquatic flora. There is only need of well defined proper management and awareness among the people for conservation and proper utilization.

## **CONCLUSION**



Oxalis corniculata



Ranunculus scleratus



Oldenlandia corymbosa



Ammannia baccifera



Hygrophila auriculata



Spillanthes acmella



Alternanthera sessilis



Eclipta prostrata

## Jha et al :Biodiversity of aquatic flora in Raja bandh pond of Jamtara district of Jharkhand (India)



Rumex dentatus



Ludwigia adscendens



Ipomea aquatica



Utricularia aurea

## REFERENCES

- 1. **Kulshrestha, S.K. 2005**. "Biodiversity conservation of Fresh water ecosystem in India."
- 2. Haines 1978. "Botany of Bihar and Orissa."
- 3. **Naskar 1990**. "Aquatic and semi-aquatic plants of lower Ganga delta."



Nymphoids indicum







Marselia quadrifolia

- 4. **Bhowmik** *et al* **2013.** "Ethno-medicinal and phytochemical screening of some hydrophytes and marsh plants of Tripura."
- 5. Verma, S. & Khan, J.B. 2014. "Biodiversity assessment of Aquatic plants in Jhunjhunu district of Rajasthan , India."
- 6. **Bornette, G. & Pujalon, S. 2011**. "Response of aquatic plants to abiotic factors: a review."

\* \* \*

# Biospectra : Vol. 10(1), March, 2015, Spl. issue.

An International Biannual Refereed Journal of Life Sciences