

Available online at <http://www.ijims.com>

ISSN: 2348 – 0343

**A Preliminary Survey of Pollution Tolerant Aquatic Plants of
Kolong river, Nagaon, Assam**

*K.K.Medhi¹, S. Borkataki², S. Borthakur³

¹⁻² Department of Botany, Nowgong College, Nagaon, Assam.

³ Department of Botany, Gauhati University, Guwahati, Assam.

*Corresponding author : K.K.Medhi

Abstract

The present communication deals with the study of pollution tolerant aquatic plants of river Kolong, flows through several heavily populated urban sites of Nagaon District. The study reveals enumeration of 54 species of angiosperm followed by 4 species of pteridophytes was reported. Among the identified species *Eichhornia crassipes* is the most dominant followed by *Alternanthera phylloxeroides* and *Polygonum glabra*.

Keywords: Pollution tolerant, Kolong, Nagaon, Urban.

Introduction

In the middle Assam, Nagaon district is blessed with several rivers, reserve forests, hills and hillocks, and the famous world heritage site, Kaziranga National Park. Out of the several river and tributaries, the river Kolong, a distributory of mighty Brahmaputra flows through the district about a distance of 100 K.M. At present the upstream part of the river become dead, only towards the downstream part, river is filled with water in the winter season. Due to the increase concentration of several man made pollutants like pesticide, plastics, chemicals, organic wastes, hydrocarbon *etc.* as well as natural domestic pollutants like house hold debris, organic debris, litters *etc.*, the river is heavily polluted. According to the water quality analysis report of MOEF, Govt of India, Kolong is one of the most pollutant river of Assam. Though there are several measures like chemical, physical, biological methods to evaluate the health and water quality of a river, the analysis of pollution tolerant species, as well as pollution tolerant index is a very significant means of measuring the health of a river or stream (William M. Beck, 1994; Gerresten *et al* 1995). The present communication deals with the collection, identification, documentation and availability of the pollution tolerant plant species growing along the river course at different study sites.

Materials and Methods

Season wise survey, collection, identification and taxonomic documentation of aquatic plant species were done. For convenience and observing the climatic condition, the whole year has been divided into Monsoon (May to October) and Post Monsoon (November to April) seasons. For sample survey and collection, 4 (four) study sites in the up and down stream region of the river namely Jakhlabandha, Koliabor, Nagaon and Hariamukh (Raha) had been selected and their geographical coordinates are recorded. The collected specimens were identified by studying micro and macro-morphological characters and in consultation with available literatures and references (Fischer, 1931; Hazarika & Borthakur, 2014; Hazarika & Dutta, 1994; Bennet, 1986). Using standard method (Rao & Verma, 1972) herbarium preparation of such plants was done. Further conformation was done by comparing its description and herbarium sheets with the local herbarium of Gauhati University and BSI herbarium, Shillong.

The different season's pollution tolerant species are listed out in tabular forms. They may be categories as follows **class 1**- Pollution sensitive species (never grow in polluted environment) e.g. *Aponogetum*, *Potamogeton*, **class 2** – Moderately sensitive species - moderately tolerant to polluted environment e.g. *Hydrilla*, *Vallisneria* and **class 3** – Tolerant species e.g. *Eichhornia*, *Alocassia* etc. (Kshirsagar & Gunale, 2013; Kumar *et al.* 2012)

Table 1: Study sites and GPS co-ordinations.

SI No	Study site	G P S co-ordinations	
1	Jakhalabandha-	26 ⁰ 30'45.5" N	92 ⁰ 56'34.2"E
2	Koliabor	26 ⁰ 35'24.5"N	92 ⁰ 56'34.2" E
3	Nagaon Town	26 ⁰ 20'09.4"N	92 ⁰ 40'02.8"E
4	Hariamukh (Raha)	26 ⁰ 13'22.8"N	92 ⁰ 32'31.0"E

Result and Discussion

Different macrophytic species of angiosperm and pteridophytes were collected during different seasonal field visits. As a result of the study a total of 58 species of angiosperm and pteridophytes, of monsoon and post monsoon seasons, belonging to 30 families and 40 genera are collected. Out of which 4 pteridophytes, 24 dicot and 30 monocot species were identified. Most of the above species have the capacity of absorbing different pollutants like heavy metal, pesticides, organic deposits and other toxins. Some of the important pollution tolerant species collected from the study sites were *Eichhornia*, *Alocassia*, *Colocassia*, *Alternanthera*, *Monocharia*, *Pistia* and *Persicaria*. Findings of the study are presented in tabular form as follows

1) Monsoon Season plants (May-October)

Table – II

S\N	Name	Family	Occurrence site
1.	<i>Alternanthera philoxeroides</i> (Mart) Griseb.	Amaranthaceae	Nagaon
2.	<i>A. pungens</i> Kunth.	Amaranthaceae	Koliabor
3.	<i>A. sessilis</i> (L) R. Br.exDC.	Amaranthaceae	All sites
4.	<i>Aponogeton natans</i> (L) Engl.& Krorse.	Aponogetonaceae	Hariamukh
5.	<i>Azolla pinnata</i> (pteridophyte)	Salviniaceae	From all sites
6.	<i>Alocassia acuminata</i> Schott.	Araceae	Do
7.	<i>A. tornicata</i> (Roxb.) Schott.	Araceae	Do
8.	<i>A. indica</i> (Lour) Koch.	Araceae	Do
9.	<i>Amorphophallus bulbifera</i> (Schott) Bl.	Araceae	Koliabor, Raha Jakhalabandha,
10.	<i>Arundo donax</i> Lin.	Poaceae	Koliabor
11.	<i>Bacopa monieri</i> (L) Penmell.	Scrophulariaceae	Koliabor
12.	<i>Cynodon dactylon</i> (L) Pers.	Poaceae	Do
13.	<i>Colocassia esculenta</i> (L) Schott.	Araceae	Do
14.	<i>C. benghalensis</i> Lin.	Araceae	All sites
15.	<i>C. oblique</i> Buch. Ham.	Araceae	Koliabor
16.	<i>Cyperus rotundus</i> Lin.	Cyperaceae	Koliabor
17.	<i>C. brevifolius</i> (Rottb) Haosk.	Cyperaceae	All sites
18.	<i>Commelina diffusa</i> Burm.	Commelinaceae	Nagaon, Koliabor
19.	<i>Dentella repense</i> (Linn) Frost.	Rubiaceae	Nagaon, Koliabor
20.	<i>Eclipta prostrata</i> Lin.	Arteraceae	All the sites
21.	<i>Eichhornia crassipes</i> (Mart.) Solms.	Pontederiaceae	Do
22.	<i>Heliotropium indicum</i> Linn.	Boraginaceae	Do
23.	<i>Hydrilla verticillata</i> (L. F.) Royle.	Hydrocharitaceae	Nagaon, Koliabor, Hariamukh

24.	<i>Hymenachne pseudo-interrupta</i> C. Muell.	Poaceae	Koliabor , Nagaon
25.	<i>Jussiaea repens</i> L.	Onagraceae	Koliabor, Nagaon,
26.	<i>Leersia hexandra</i> Sw.	Poaceae	Koliabor, Nagaon, Hariamukh
27.	<i>Manochoria hastate</i> (L) Solms	Panitidewaceae	Nagaon, Koliabor
28.	<i>M. vaginalis</i> (Burm F.) Presl	Panitidewaceae	Do
29.	<i>Nymphaea nouchali</i> Burm F.	Nymphaceae	Koliabor, Nagaon, Hariamukh
30.	<i>N. rubra</i> Roxb ex Andreas	Nymphaceae	Do
31.	<i>Nymphoides cristatum</i> (Roxb) o. Kuntze	Nymphaceae	Nagaon, Hariamukh
32.	<i>Pistia stratioidis</i> L	Araceae	All sites
33.	<i>Polygonum orientale</i> (L) Spach	Polygonaceae	All sites
34.	<i>P. perfoliata</i> (L) G. Gross	Polygonaceae	Koliabor, Nagaon
35.	<i>P. reemcinata</i> (Buch-Ham ex D Don)	Polygonaceae	Do
36.	<i>Persicaria auriculata</i> Kunth.	Polygonaceae	Koliabor, Nagaon, Hariamukh
37.	<i>P. bahbata</i> (L) Hara	Polygonaceae	All sites

2) Post Monsoon Season (Nov-April)

Table – III

S/N	Name	Family	Study Site
1.	<i>Aeschynomense indica</i> L	Papilionaceae	Koliabor, Hariamukh
2.	<i>Acorus calamus</i> L	Araceae	Koliabor
3.	<i>Ceratophyllum demersum</i> L	Ceratophyllaciacae	Koliabor, Nagaon, Hariamukh
4.	<i>Cyperus corymbosus</i> Rottb	Cyperaceae	All the sites
5.	<i>C. playtistylis</i> R Br	Cyperaceae	Do
6.	<i>Cynodon dactylon</i> (L) Pers	Poaceae	Do
7.	<i>Enhydra fluctuans</i> Lour	Asteraceae	Do
8.	<i>Hoppea dichotoma</i> Wild	Gentianaceae	Do
9.	<i>Hygrophila auriculata</i> (Schum) Heine	Acanthoaceae	Nagaon, Koliabor, Jakhlabandha
10.	<i>Ipomoea aquatica</i> Forsk	Convolvulaceae	Do
11.	<i>I. carnea</i> (Mart ex. Choisy) Austin	Convolvulaceae	Nagaon, Koliabor
12.	<i>Lemna perpusilla</i> Torrey	Lemnaceae	All the sites
13.	<i>Ludwigia perrenis</i> Linn	Onagraceae	All sites
14.	<i>Rumex dentatus</i> Linn	Polygonaceae	Koliabor, Nagaon, Hariamukh
15.	<i>Spirodela polyrrhiza</i> (L) Schleid	Polygonaceae	Do
16.	<i>S. punctata</i> (Mayer) Thomson	Polygonaceae	Nagaon, Koliabor
17.	<i>Vallisneria spiralis</i> Linn	Hydrocharitaceae	Nagoan, Koliabor
18.	<i>Vetiveria Zizaniodes</i> (L) nash	Poaceae	Koliabor, Nagaon, Hariamukh

Table – IV

Sl No	Macrophyte	Family	Genera
1.	Dicotyledon	16	15
2.	Monocotyledon	11	22
3.	Pteridophyte	3	3

Conclusion

From the above studies it is revealed that many pollution tolerant species are growing along the river course, signifying the high level pollution of the river. Besides the frequency of occurrence of pollution tolerant species is high in the Koliabor & Nagaon Township sites. This clearly indicates that, this part of the river is highly polluted. Study of the water quality parameters like pH, D O, turbidity, TDS etc also confirms the high pollution level of the river. Effective urgent measures required to adopt to reduce the level of pollution for the future sustainability of the river.

References

S. Ramesh Kumar, T. Arumugam, C.R., Anandakumar, S.Balakrishnan & D.S.Rajavel (2012). Use of Plant Species in Controlling Environment Pollution- A Review. Bulletin of Environment, Pharmacology and Life Sciences. Vol 2(2),52-63.

Hajarika,S AND Borthakur, S.K. (2014). Hydrophytic Flora of Assam II. Diversity of aquatic and wetland vascular plants of Nagaon District of Assam, INDIA. **Pleione** 8(1): 96-108.

Hazarika, A.K & Dutta, A. (1994). Limnological studies of two freshwater ponds of Guwahati, Assam. Environment and Ecology. 12(1), pp 26-29.

Bennet,S.S.R. (1986). Name changes of flowering plants of India and adjacent areas. Tata Mc Graw Hill Publication.

Kanjilal U.N, Kanjilal P.C, Das A and Dey R.N. (1934-1940).Flora of Assam Vol I-IV.

Bor N.L. (1940). Flora of Assam Vol- V.



Fig: Photographs showing habitats of different ecological species from different sites of river Kollong.