Biolife AN INTERNATIONAL QUARTERLY JOURNAL OF BIOLOGY & LIFE SCIENCES 2(4):1170-1180

ISSN (online): 2320-4257
www.biolifejournals.com

BIOLIFE RESEARCH ARTICLE

ENUMERATION OF MACROPHYTES OF EUTROPHICATED AND NON-EUTROPHICATED LAKES OF TWO TAHASILS OF KARIM NAGAR DISTRICT, TELANGANA. INDIA

G. Odelu*[1], N.Manoj Kumar[2], N.Siddulu[3], K.Raghu[4]

[1-2] *Department of Botany, Government Degree College, Jammikunta, Karimnagar, Telangana, India- 505 122*
[3-4] *Department of Botany, University College of Science, Osmania, University, Hyderabad, Telangana, India – 500 007*

E-mail: odelugk.bot@gmail.com

ABSTRACT

Present study was conducted on four fresh water ecosystems to analyses, the importance of freshwater ecosystems. Biological components, species diversity, alien species, aquatic macrophytes distribution in four lakes around study area was studied during 2012-2014. Among these four lakes we expressed in terms of four sites. In this some areas divides into sub areas due to some are having more upstream catchment areas and also. Total number of species 148 varying by their mesotrophic and eutropic habitat condition .Site I 74 Site II 68 Site III 131 Site IV 95.Total Genera 104 and Families 44 recorded during this study .Maximum specie are recorded from site III that number followed by site IV ,site I , site II . The use of several species in phytoremidiation has increased recently as on alternative technique for treatment of domestic as well as industrial water containing several effluents. This suggests that anthropogenic activities have some limits; if we cross them, then it will cause unfavourable to human and as well as all organisms by effecting of changing of ecological niche and tropic levels.

Key words: Eutrphication, Invasive Weeds, Macrophytes, Phytoremediation, Fresh Water Ecosystem.

INTRODUCTION

Water is one of the natural resource available abundant in nature .Almost every organism require to maintain its biological activities .Which man exploited more than other resource for sustenance of life. (Sulthana and Sharif 2004) Water quality is the best parameter to analyze its phytoplankton status and its biological species biodiversity status. Pollutions of different kinds unfavorable changes, acidification and alien species invasion lead to reduction of native macrophytic biodiversity which also threatens the fauna biodiversity of fresh water ecosystems (Upen and Deka and Sarada Kanta Sharma 2014).

Aquatic weeds defined as macrophytes constitute an important component of aquatic ecosystem. According to Abu-Bakr macrophytes when present in large abundance have the power of modifying the composition and distribution of other organisms in water body. Present study reveals that mainly focusing on macrophytic flora .In this we studied four lakes two are non-eutrophicated, else two are eutrophicated with industrial waste water ,domesticated water of

due civilization process. Human beings population increases create lot of problems under this drainage water released into mainly into ponds, lakes, rivers etc.

Weeds can chocked streams typically show wide diurnal variation in temperature and PH, extreme values of which can influence habitat suitability (Wilcock at al 1998). The nutrient contain concentration normally limits the growth and production of Phytoplankton (Basker at al 2009). Some times macrophytes diversity shows their effect on Phytoplaktons growth and their distribution. Incase of macrophytes having of big leaves like Eichornia, Nyphea and Sagittaria causing of Phytoplankton's spatial competition. It can leads to intra and inter specifically competition between different algal groups, mainly which are floating on surface water. Aquatic macrophytes figure prominently in the community structure and tropic events of the reservoirs in India and the factors for aging of reservoir and pollution Sugunam(1989).Alien species or exotic organisms that occur outside the natural adopted ranges and dispersal potential many alien species supports our farming and forestry systems in bulk . But a few alien species became invasive when they are introduced intentionally or unintentionally outside from their natural habitats into new areas where they express the capability to establish invade and compete without s of their native.

It causes severe damage of fresh water ecosystems .Several workers already that if this process goes long period then it will cause a great damage to human society. Sen & Chatterjee (1959), Vyas (1964), Bhaskar & Razi (1973), Kachroo (1984), Chowdhury (2009), and Chowdhury & Das (2010, 2011).

MATERIAL AND METHODS

We take four lakes for studying of macrophytes distribution, diversity, and dominance of some species. Among these four lakes we expressed in terms of four sites .In this we divide each site into three areas based on their catchment of water, storage and downstream distribution water .In this some areas divides into sub areas due to some are having more upstream catchment areas and also downstream distribution .Site I located in west part 0f Jammikuta town (it is one of Tahasil of Karim Nagar district,Telangana .India .All four sites are in Karim Nagar district but distributed in two Tahasils namely i.e. Jammi Kunta and Huzurabad .Site I having its border with Villages Mothkula Gudem, Macanapally, Jaggaiapally, Abadi, and itself Jammikunta Town. It Occupies Nearly Acres (500).This water formerly used as irrigation, drinking, pisiculture. Now a day's also used as irrigation, pisciculture. It distributed nearly seventy five percent urbanized area .Only quarter part non urbanized area. Its main water source upstream ponds and one of the drain of upstream .It has two downstream canals, one is severely eutrophicated with rice mill effluents and domesticated water .Another one as much as earlier one. site II was situated near the town of Huzurabad. It was a revenue division in Karim Nagar district .Borders with own itself and joopaka ,another two villages site having of two upstream catchments ,in this one is eutrophicated another one irrigated water catchment and combination with domesticated water .But not polluted as much as of site I. It occupies nearly acres of (250).Site III located in village south part of chelpur .It occupies nearly 400 acres borders with west side Thokalapally, north part of chelpur ,south Joopaka. East another two villages it has two upstream catchment purely rain water and sometimes canal water from S.R.S.P.L.M.D.Karim Nagar,and also upper parts of paddy fields .This one is free from eutrophication, it has two down streams to irrigation purpose and drinking water .Site IV was located in villages west and part of Chelpur upper portion. It occupies nearly (250) acres ,having with only one catchment area ,two down steams .This lake water mainly used for irrigation, its borders with north side Shalapally village.

The Water Samples From these lakes were collected fortnightly during the period of September 2011 to September 2014. The data was pooled together and was represented annually. The physico chemical analysis of water samples performed as per the procedures

Table-1. Plants list Habit, H=herb, US=under shrub, C l=Climber, IUCN, NE=Not evaluated, LC=Least concerned, DD=Data deficient.

Sl No	Scientific Name	Family	Habit	SITES I	II	III	IV	Life form	IUCN Version 2014.2
1.	*Aerva laneta*	Amaranthaceae	H	_	_	+	+	EA	NE
2.	*A. javanica*	Amaranthaceae	H	_	_	+	_	EA	NE
3.	*Aeschynomene aspera* L.	Fabaceae	US	+	+	+	+	EA	LC
4.	*A. indica* L.	Fabaceae	US	+	_	+	_	EA	NE
5.	*Ageratum conyzoides* L.	Asteraceae	H	+	+	+	+	EA	NE
6.	*Alysicarpus vaginalis* (L)DC	Fabaceae	US	_	_	+	+	EA	NE
7.	*Amaranthus spinosa*	Amaranthaceae	H	_	_	+	+	EA	NE
8.	*A.virides* L.	Amaranthaceae	H	+	_	+	+	EA	NE
9.	*Ammania buccifera*	Lythraceae	H	+	+	+	+	EA	NE
10.	*A.roxiburghi*	Lythraceae	H	_	_	+	+	EA	NE
11.	*Alternanthera philoxeroides* (Mar) Grisep.	Amaranthaceae	H	+	+	+	_	EA	NE
12.	*A. pungens*	Amaranthaceae	H	+	+	+	_	EA	NE
13.	*A.sessilis* (L.)R.Br.exDC.	Amaranthaceae	H	+	+	_	+	SA	DD
14.	*Aponogeton appendiculatus* H.Brug	Aponogetonaceae	H	_	_	+	_	SA	NE
15.	*A. natans*	Aponogetonaceae	H	_	_	+	+	SA	NE
16.	*Argemone mexicana* L.	Papaveraceae	H	+	+	_	+	EA	NE
17.	*Aurundo donax* L.	Poaceae	H	_	_	+	+	EA	NE
18.	*Auxonopus compressus* (Sw.) P. Beauv.	Poaceae	H	_	_	+	+	EA	NE
19.	*Azolla pinnata R.Br.*	Salviniceae	H	+	_	+	+	FF	LC
20.	*Bidens pilosa*	Asteraceae	H	_	_	+	_	EA	LC
21.	*Bergia capensis acquatica*	Elatinaceae	H	+	_	+	_	EA	NE
22.	*Blumea eriantha*	Asteraceae	H	_	+	+	_	EA	NE
23.	*Breniya retusa*	Euphorbiaceae	H	_	_	+	+	EA	NE
24.	*Cassia hirsuta*	Caesasaphinaceae	H	_	_	+	+	EA	LC
25.	*C. occidentalis*	Caesasaphinaceae	H	_	_	+	+	EA	LC
26.	*C. tora* L.	Caesalpiniaceae	H	+	_	+	_	EA	LC
27.	*Ceratophyllum demersum* L.	Ceratophyllaceae	H	+	+	+	+	SA	NE
28.	*Chara brauni*	Characeae	H	_	_	+	+	SA	NE
29.	*Ch. globularis J.*	Characeae	H	+	_	+	+	SA	NE
30.	*Cleome viscosa*	Capparidaceae	H	_	+	_	_	EA	NE
31.	*C. gynandra*	Capparidaceae	H	_	_	+	_	EA	NE
32.	*C.fellina*	Capparidaceae	H	+	_	_	_	EA	NE
33.	*C.monophylla*	Capparidaceae	H	_	_	+	+	EA	NE
34.	*Coldenia procumbena*	Boraginaceae	H	+	+	+	+	EA	NE
35.	*Commelina benghalensis* L.	Commelinaceae	H	+	_	+	+	SA	LC
36.	*C. haskarhi*.**L**	Commelinaceae	H	_	_	+	_	SA	NE
37.	*Corchorus aestivus*	Teliaceae	H	+	_	+	+	EA	NE
38.	*Croton banaplandium*	Euphorbiaceae	H	+	+	+	+	EA	NE
39.	*Cynodon dactylon* (L) Pers.	Poaceae	H	+	+	+	+	EA	NE
40.	*Cynoglossum zeylanicum* (Vahl.) Thunb.ex Lehm.	Boraginaceae	H	_	_	+	_	SA	NE
41.	*Cyperus alternifolius*	Cyperaceae	H	_	+	+	_	EA	LC
42.	*C. compressus* L.	Cyperaceae	H	+	+	+	_	EA	LC
43.	*C. corymbosus* Rottb.	Cyperaceae	H	_	+	+	_	EA	LC
44.	*C .difformis*	Cyperaceae	H	_	_	+	_	EA	LC

Table-1. ..

Sl No	Scientific Name	Family	Habit	SITES I	II	III	IV	Life form	IUCN Version 2014.2
45.	*C.rotundus* L.	Cyperaceae	H	+	+	+	_	EA	LC
46.	*Dentella repens* Forst.	Rubiaceae	H	+	_	+	_	EA	NE
47.	*Desmodium triflorum* (L.) DC.	Fabaceae	H	_	_	+	_	EA	LC
48.	Digera muricata	Amaranthaceae	H	_	_	+	_	EA	NE
49.	*Digitaria sanguinalis*	Poaceae	H	+	_	+	_	EA	NE
50.	*Echinocloa colonum*	Poaceae	H	+	_	+	+	EA	NE
51.	*E. cruss galli*	Poaceae	H	_	_	_	+	EA	NE
52.	*Eclipta alba*. (L.) L.	Asteraceae	H	+	_	+	_	EA	DD
53.	*E. prostrata* (L.) L.	Asteraceae	H	_	_	+	_	EA	DD
54.	*Eichhornia crassipes* (Mart.) S.L.	Pontederiaceae	H	+	+	_	_	FF	NE
55.	*Elaeocharis dulcis* (Burm.F.) Henschel.	Elaeocharaceae	H	+	+	+	+	EA	NE
56.	*Enhydra fluctuans* Lour.	Asteraceae	H	+	_	+	_	EA	NE
57.	*Ergastostis pilosa*	Poaceae	H	_	_	+	_	EA	NE
58.	*Eupatorium riparium*	Asteraceae	H	-	+	+	+	EA	NE
59.	*Euphorbia hirta* L.	Euphorbiaceae	H	+	+	+	+	EA	NE
60.	*E.indica*	Euphorbiaceae	H	_	_	+	+	EA	NE
61.	*E.serpens Kunth*.	Euphorbiaceae	H	_	_	+	_	EA	NE
62.	*Fimbristylis bisumbellata*	Cyperaceae	H	+	+	+	+	EA	LC
63.	*Glinnus lotoides*	Molluginaceae	H	+	+	+	+	EA	NE
64.	*Gomphrena celestoidis*	Amaranthaceae	H	+	+	+	+	EA	LC
65.	*G. serrata*	Amaranthaceae	H	_	_	+	_	EA	LC
66.	*Grangea maderaspatana* (L.) Poir.	Asteraceae	H	_	_	+	+	SA	LC
67.	*Heliotrophium curasavica*	Boraginaceae	H	+	+	+	_	EA	NE
68.	*H.indica*	Boraginaceae	H	+	+	+	+	EA	NE
69.	*H.supimum*	Boraginaceae	H	+	_	+	+	EA	NE
70.	*Hydrilla verticillata* (L.f.) Royle.	Hydrocharitaceae	H	+	+	+	+	SA	LC
71.	*Hydrolea zylanica*	Hydrocharitaceae	H	_	_	+	+	SA	LC
72.	*Hygrophila aurundifolia*	Acanthaceae	H	_	_	+	_	SA	NE
73.	*Hygrophila sculli*.	Acanthaceae	H	+	_	+	_	SA	NE
74.	*H.spinosa*	Acanthaceae	H	+	_	+	_	SA	NE
75.	*Hygroryza aristata* (Retz.) Nees.	Poaceae	H	_	_	+	+	RFL	NE
76.	*Hyptis suaveolens*	Lamiceae	H	_	+	+	_	EA	
77.	*Ipomoea aquatica* Forssk.	Convolvulaceae	H	_	+	+	+	RFL	LC
78.	*I. carica*	Convolvulaceae	S	_	+	-	_	SA	NE
79.	*I. carnea* Jaeq.	Convolvulaceae	S	_	+	+	+	EA	NE
80.	*Juncus Spp.*	Juncaceae	H	_	_	+	+	EA	NE
81.	*Jussiea repens*	Onagraceae	H	_	_	+	+	SA	NE
82.	*Kyllinga monocephela* Roxb.	Cyperaceae	H	_	+	+	+	EA	NE
83.	*Lantana camara*	Lamiaceae	S	+	+	_	_	EA	LC
84.	*Leersia hexandra* Sw.	Poaceae	H	+	+	_	_	EA	NE
85.	*Lemna purpusilla* Torrey	Lemnaceae	H	+	+	+	+	FF	NE
86.	*Leucas aspera* Link	Lamiaceae	H	_	_	+	+	EA	NE
87.	*Ludwigia adscandens* (L.) Hara	Onagraceae	H	_	_	+	+	RFL	NE
88.	*L. parviflora* Roxb.	Onagraceae	H	+	_	+	+	EA	NE
89.	*L. perennis* L.	Onagraceae	H	_	_	+	+	EA	NE
90.	*L.octavalis*	Onagraceae	H	_	_	+	+	EA	NE

Table-1. ..

Sl No	Scientific Name	Family	Habit	SITES I	II	III	IV	Life form	IUCN Version 2014.2
91.	*Marsalia quadrifolia L.*	Marseliaceae	H	+	+	+	+	EA	NE
92.	*Merremia aegyptia*	Convolvulaceae	C	_	_	+	+	EA	NE
93.	*Microstachis chamalea*	Euphorbiaceae	H	_	_	+	_	EA	NE
94.	*Mikania micrantha* Willd.	Asteraceae	H	+	+	_	_	EA	NE
95.	*Mollugo nudiflora*	Molluginaceae	H	_	+	+	+	EA	NE
96.	*M.pentaphylla*	Molluginaceae	H	+	_	+	+	EA	NE
97.	*Monochoria vaginalis*	Pontederiaceae	H	_	_	+	+	FF	LC
98.	*Murdania nudiflora*	Commelinaceae	H	+	+	+	+	SA	NE
99.	*Najas indica* (Willd.) Cham.	Najadaceae	H	+	+	+	+	SA	LC
100.	*N. minor* All.	Najadaceae	H	+	+	+	+	SA	LC
101.	*Nechamadra spp.*	Hydrocharitaceae	H	_	_	+	_	EA	NE
102.	*Nymphaea alba* L.	Nymphaeaceae	H	+	+	+	+	RFL	LC
103.	*N.nouchali* Burm.f.	Nymphaeaceae	H	+	+	+	+	RFL	LC
104.	*Nymphoides cristata* (Roxb.)Kuntze	Nymphaeaceae	H	+	+	+	+	RFL	LC
105.	*N.indica* (L.) Kuntze	Nymphaeaceae	H	_	+	+	+	RFL	LC
106.	*Oldenlindia corymbosa* L.	Rubiaceae	H	+	_	+	_	EA	NE
107.	*Ottelia alismoides* (L.) Pers.	Hydrocharitaceae	H	+	+	+	+	SA	LC
108.	*Panicum repens* L.	Poaceae	H	_	_	+	+	SA	LC
109.	*Parthenium hysterophorus* L.	Asteraceae	H	+	+	+	+	EA	NE
110.	*Phalaris aurundinosa*	Poaceae	H	_	_	+	+	SA	NE
111.	*Phaseolus trilobus*	Fabaceae	H	_	_	+	+	EA	LC
112.	*Phyla nodiflora* (L.) Greene	Verbenaceae	H	+	+	+	+	SA	LC
113.	*Phyllanthus nururi* L.	Euphorbiaceae	H	_	_	+	+	EA	NE
114.	*P.maderespetansis*.L	Euphorbiaceae	H	_	_	+	-	EA	NE
115.	*P.vigratus* .G.frost	Euphorbiaceae	H	_	_	+	-	EA	NE
116.	*Pistia stratiotes* L.	Araceae	H	+	+	-	-	FF	NE
117.	*Polygonum plebium*L.	Polygonaceae	H	_	_	+	+	EA	NE
118.	*P.phytolaccifolium*	Polygonaceae	H	_	_	+	+	EA	NE
119.	*Portulaca oleracea*	Portulacaceae	H	_	_	+	+	EA	NE
120.	*Potomogeton crispus* L.	Potamogetonaceae	H	+	+	+	+	SA	NE
121.	*P.pectinatus*	Potamogetonaceae	H	+	+	+	+	SA	NE
122.	*Puccinella sp.*	Poaceae	H	+	_	_	_	EA	NE
123.	*Rorippa palustris*	Brassicaceae	H	+	+	+	+	EA	NE
124.	*Rotala densiflora* Koehne	Lythraceae	H	+	+	+	+	SA	LC
125.	*Rungia parviflora* (Retz.) Nees.	Acanthaceae	H	_	_	+	+	SA	NE
126.	*Sagittaria sagittifolia* L.	Alismaceae	H	_	_	+	_	EA	LC
127.	*Schoenoplectus articulatus* (L.)	Cyperaceae	H	_	+	_	_	EA	NE
128.	*Scirpus articulatus* L.	Cyperaceae	H	+	+	+	+	EA	NE
129.	*S*.sp.	Cyperaceae	H	_	_	+	+	EA	NE
130.	*Scoparia dulcis* L.	Scrophulariaceae	H	_	_	+	+	EA	NE
131.	*Sesbania binispinosa*	Fabaceae	H	+	+	+	+	SA	LC
132.	*Setaria verticillata* (L.) P.Beauv.	Poaceae	H	_	_	+	+	EA	NE
133.	*Sida acuta*	Malvaceae	H	_	+	+	+	EA	NE
134.	*Sopubia delphinifolia*	Scrophulariaceae	H	_	_	+	_	EA	NE
135.	*Sphaeranthus indica*	Asteraceae	H	_	_	+	+	EA	NE
136.	*Tephoshia pururea*	Fabaceae	H	_	+	+	+	EA	NE
137.	*Tetrastigma obovatum*	Fabaceae	Cl	_	_	_	+	EA	NE
138.	*Tragia involucrata*	Euphorbiaceae	H	+	+	_	_	EA	LC

Table-1. ..

Sl No	Scientific Name	Family	Habit	SITES I	II	III	IV	Life form	IUCN Version 2014.2
139.	*T. plukenetii*	Euphorbiaceae	H	+	+	_	_	EA	LC
140.	*Trianthema portulacanthem*	Aizoaceae	H	+	+	+	+	EA	NE
141.	*Tribulus terrestris*	Zygophyllaceae	H	_	+	+	+	EA	LC
142.	*Tridax procumbens*	Astaraceae	H	+	+	+	+	EA	LC
143.	*Typhaa aungstifolia*.	Typhaceae	H	+	+	+	+	EA	NE
144.	*Urena lobata* L.	Malvaceae	H	+	+	+	+	EA	NE
145.	*Valisnaria spiralis* Linn.	Hydrocharitaceae	H	+	+	+	+	SA	NE
146.	*Vernonia anagallis-aquatica* (L.) Lees.	Asteraceae	H	+	+	+	_	SA	NE
147.	*Wolffia arrhiza*	Araceae	H	+	+	_	_	FF	NNNE
148.	*Xanthium strumarium* L.	Asteraceae	H	+	+	+	+	EA	NE

especially high level of adaptability. Due to their high density and high mass production causes one of the main reasons of loss of endangered and endemic species. Like Parthinium hystoroforus, Hyptis suaveolulens .According to Darwin 1959 the widely spreading ranges of aquatic plants have traditionally due to the migratory birds(Arber 1920, Hutchinson 1975) Aquatic macrophytes with in the eco system diversity is related not only to Geographical factor like size of the body (Rorslett 1991) due to heterogeneity of environmental factors affected macrophytes growth .orted.

Eutropication is one of the greatest environmental problems worldwide and aquatic macrophytes may prove to be" Biological engineers" to aid in restoring water quality (Byers at al 2006) One of the major weed Eichornia crassipes originated in south America, create sever problems worldwide and also Salvinia these two are worlds worst aquatic pests due to their aggressive competitive growth importing aquatic eco systems (Pieters and Murphy 1993) and also Hydrilla verticellata native of Central South Asia, is one of the major problematic weed in United States Of America . This country spending of millions of dollars on controlling of Hydrilla verticellata controlling through Herbicides, biological agents in terms of bulk cleaning of lakes etc. Due to the human society introduced some invasive plants in different modes. For example thatch the houses, mats etc. Cyperus used as medicine, Alternathara philoxeroides, Sagittaria . And some are in another ways like aesthetic values, Nymphaea species etc.

The use of several species in phytoremidiation has increased recently as on alternative technique for treatment of domestic as well as industrial water containing several effluents. Finally alien species introduction eutrophication causes severe damage to macrophytes diversity

Table No.2 Life forms of plants

Free floating (FF)		Rooted floating(RFL)		Submerged weeds(SA)		Emergent weeds(EA)		Total	
No.	%	No.	%	No.	%	No.	%	No.	%
6	4	7	4.7	31	21	104	70	148	100

Table No .3 list of families and species

	Dicotyledons		Monocotyledons		Pteridophyta		Algae		Total	
	No	%	No	%	No	%	No	%	No	%
Families	23	52.5	18	40	2	5	1	2.5	44	100
Species	94	63	50	34	2	1.5	2	1.5	148	100

many of the threats to fresh water eco system i.e., climate change, eutrophication will result in reduced macrophyte diversity and will in term threaten the Faunal diversity of aquatic eco systems and favour the establishment of alien species. It causes gradual depletion of native species.

Aquatic macrophytes include emergent macrophytes(E.M). Plants that are rooted in submersing soil with folia in to the floating leaved macrophytes plants rooted to the lake bottom with leave that float on the surface of the water. Submersed macrophytes that grow completely under the water with root or root like

Table.No.4 Invasive species

S.No.	Species Name	Family	Origin	Life Form	Habit
1.	*Aerva javanica*	Amaranthaceae	Trop.America	H	A
2.	*Ageratum conyzoides L.*	Asteraceae	Trop.America	H	A
3.	*Alternanthera philoxieroides*	Amaranthaceae	Trop.America	H	P
4.	*A.sessilis (L.) R.Br. ex DC.*	Amaranthaceae	Trop.America	H	P
5.	*Alternanthera pungeuns*	Amaranthaceae	Trop.America	H	P
6.	*Amaranthus spinosa*	Amaranthaceae	Trop.America	H	A
7.	*Argemone mexicana L.*	Papaveraceae	South America	H	A
8.	Bidens pilosa	Asteraceae	Trop.America	H	A
9.	Blumea eriantha	Asteraceae	Trop.America	H	A
10	cassia hirsuta	Caesasaphinaceae	Trop.America	H	A
11	Casia occidentalis	Caesasaphinaceae	South America	H	A
12	Cassia tora	Caesasaphinaceae	South America	H	A
13	Cleome viscosa	Capparidaceae	Trop.America	H	A
14	Cleome gynandra	Capparidaceae	Trop.America	H	A
15	Corchorus aestivus	Teliaceae	Trop.America	H	A
16	*Croton bonplandianum Baill.*	Euphorbiaceae	South America	H	P
17	Cyperus difformis	Cyperaceae	Trop.America	SE	A
18	C.alternifolius	Cyperaceae	Trop.Africa	H	A
19	Digera muricata	Amaranthaceae	South West Asia	H	A
20	*Digitaria sanguinalis*	Poaceae		H	A
21	Echinocloa cruss galli	Poaceae	South America	H	A
22	Echinocloa colonum	Poaceae	South America	H	A
23	Eclipta prostata(L).Mant.	Astaraceae	Trop.America	H	A
24	*Eichhornia crassipes* (Mart.) S.L.	Pontederiaceae	Trop.America	H	A
25	*Elaeocharis dulcis* (Burm.F.) Henschel.	Elaeocharaceae	Tropical countries	H	A
26	*Enhydra fluctuans* Lour.	Asteraceae	Malasia	H	A
27	E8upatorium riparium	Asteraceae	North America	US	P
28	Euphorbia hirta	Euphorbiaceae	Trop.America	H	A
29	Gomphrena celestoidis	Amaranthaceae	South America	H	A
30	Gomphrena serrata	Amaranthaceae	Trop.America	H	A
31	Hyptis suaveolens	Lamiceae	Trop.America	H	A
32	Indigofera linne	Fabaceae	Trop.Africa	H	A
33	Ipomea carica	Convolvulaceae	Trop.America	SE	P
34	I. carnea Jaeq.	Convolvulaceae	Trop.America	S	P
35	Lantana camara	Lamiaceae	Trop.America	S	P
36	Ludgiwia octavalis	Onagraceae	Trop.Africa	H	A
37	L.perennis	onagraceae	Trop.Africa	H	A

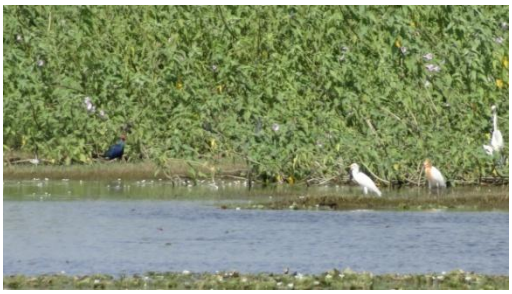
Table.No.4 Invasive species

S.No.	Species Name	Family	Origin	Life Form	Habit
38.	Merremia aegyptia	Convolvulaceae	Trop.America	C	A
39.	Mikania micrantha	Astaraceae	Trop.America	H	A
40.	Monochoria vaginalis	pontederiaceae	Trop.America	H	A
41.	Parthenium hysterophorus L.	Asteraceae	North America	H	A
42.	Passifloa foetida	Passifloraceae	South America	C	P
43.	Phalaris aurundinosa	Poaceae	Trop.America	H	A
44.	Pistia stratiotes L.	Araceae	Tropical countries	H	A
45.	Portulaca oleracea	Portulacaceae	South America	H	A
46.	Sesbania binispinosa	Fabaceae	Trop.America	H	A
47.	Setaria viridis	Poaceae	Trop.America	H	A
48.	Sida acuta	Malvaceae	Trop.America	H	A
49.	Tribulus terrestris	zygophyllaceae	Trop.America	H	P
50.	Tridax procumbens	Astaraceae	Trop.Central America	H	P
51.	Typha angustata	Typhaceae	Trop.America	H	P
52.	Urena lobeta	Malvaceae	Trop.Africa	H	P
53.	Xanthium strumarium L.	Asteraceae	Trop.America	H	A

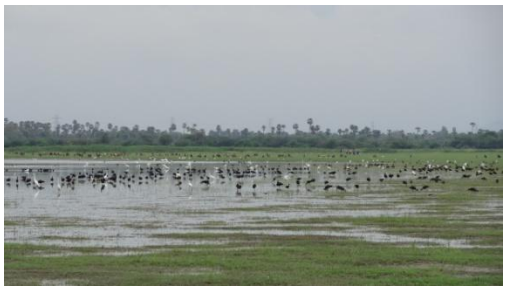
Figure-1. Invasive species photos

A) *Nymphaea nouchali* Burm.f.

B)*Valisnaria spiralis* Linn.



C)*Ipomoea carnea* Jaeq



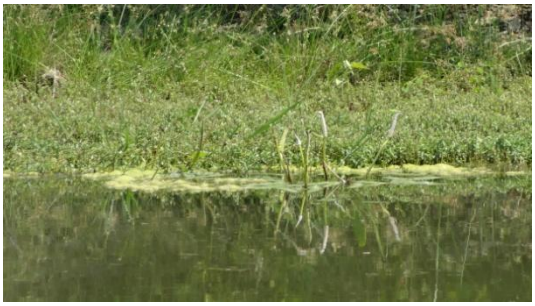
D)Birds (Migratory)

E) *Najas indica* (Willd.) Cham.

F) *Heliotrophium curasavica*

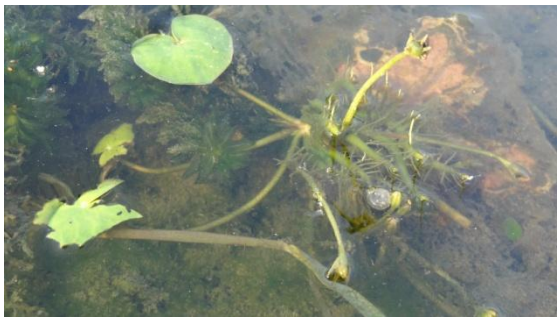
G)*Scirpus articulatus* L

H) *Portulaca oleracea*



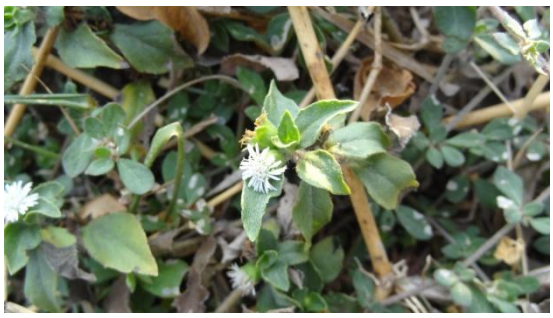
I) *Aponogeton natans*

J)*Nymphaea alba* L.

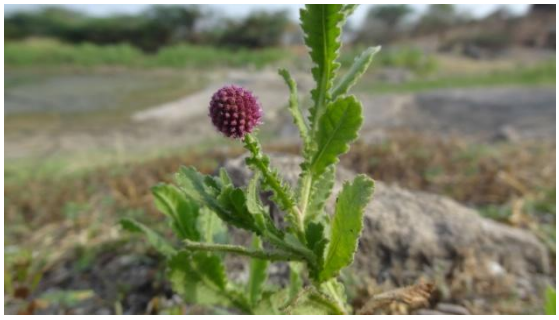


K) *Nymphoides cristata* (Roxb.)Kuntze

L) *Dentella repens* Forst.

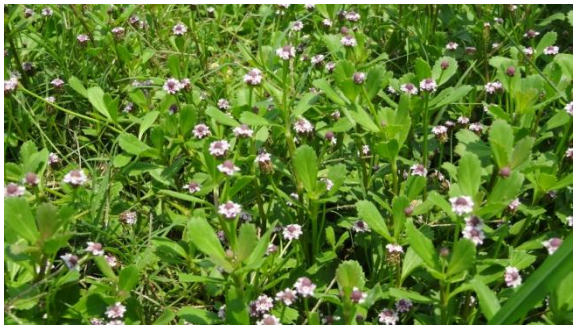


M) *Eclipta alba*. L.



N) *Sphaeranthus indica*

O) *Pistia stratiotes* L



P) *Phyla nodiflora* (L.) Green

structures in attachment with substrate. Free floating –plants that typically float on or under surface of water (chambers at al 2008)

In aquatic macrophytes some are good source of removing of heavy metals fom water due to industrial wastage ,i.e., Hydrilla verticellata ,Veronica anagalis aqutica .In terms of Phytoremediation,Phytostabilisation,Phytotransformation,Phytostimulation,Rhizofilterisation (brown et al 1990).Heavy metal concentration shows difference between that the interactions and behaviour of heavy metals with macrophytes are different from each species (Prasad and frieters).

CONCLUSION

Present study of two different nutrient based habitats indicates industrialization is also one of the major threats for fresh water ecosystems .Eutropication causes depletion of Alpha, Beta diversity and loss of native biota. This suggests that anthropogenic activities have some limits; if we cross them .Then it will causes unfavourable to human and as well as all organisms by effecting of changing of ecological niche and tropic levels.

ACKNOWLEDGEMENTS

The author grateful thank to Prof. S. Seeta Rama Rao, Professor, Department of Botany, Plant physiology and molecular biology Lab. UCS, Osmania University, Hyderabad, Telangana. The author also expresses his gratitude to Dr. B. Leela. Principal and all the staff members who encouraged and given support to author during the work, Government Degree College, Jammikunta.

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DOI: https://dx.doi.org/10.5281/zenodo.7238312
Received: 8 October 2014;
Accepted; 22 November 2014;
Available online : 11 December 2014