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## AQUATIC MACROPHYTES OF KHAMMAM DISTRICT IN TELANGANA STATE

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**Abstract:** The present study documents the diversity and distribution of freshwater macrophytes in four different lakes located in Kothagudem area of Khammam district in Telangana State. A survey of four different lakes in Kothagudem area revealed the presence of macrophytes, which were categorized as floating, submerged and emergent species. The lakes investigated included ooracheruvu (lake -1), Chathakondacheruvu (lake -2), Singhabupalemcheruv (lake -3 and Chintalacheruvu (lake -4).

During the present study at least 20 surveys at different time intervals during June, 2013 – May, 2014 was conducted from four lakes of Kothagudem town. The macrophytes identified were Angiosperms, Pteridophytes and macroscopic algae. Among the angiospermic plants dicotyledons were found to be more in number, when compared to monocotyledons.

Aquatic plants like *Pistia stratiotes*, *Nymphaea nouchali*, *Nelumbo nucifera*, *Ipomoea aquatica*, *Marsilea quadrifolia*, *Typha angustifolia*, *Alternanthera sessilis*, *Cymbopogon citratus*, *Coldenia procumbens*, *Trinathema portulacastrum* and *Heliotropium indicum* showed wide range of distribution

*Azolla pinnata*, *Pistia stratiodes*, *Salvinia natans* and *Nymphaea pubescens* were identified as floating hydrophytes. *Hydrilla verticillata*, *Vallisneria spiralis*, *Chara* spp were identified as submerged macrophytes. *Bacopa monnieri*, *Cyperus rotundus*, *Marsilea quadrifolia*, *Typha angustifolia*, *Hygrophylla auriculata* were identified as emergent forms.

From the analysis of the distribution pattern of the macrophytes, it appears that there is no well marked differentiation in colonies of floating, submerged and emergent species and as such all the communities were found in intermixed mats.

**Key words:** Diversity, Kothagudem, Khammam District, lakes, Macrophytes Telangana.

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**Introduction:** Macrophytes constitute a very prominent characteristics of an aquatic ecosystem (Sharma et al., 2007). They oxygenate water and are important for different activities of aquatic animals. They also dynamically guide the cycling of minerals and other organic constituents, thereby influencing overall biomass production of water bodies and can serve as indicators for monitoring the degree of damage in the ecosystem. Aquatic macrophytes respond to the changes in water quality and have been used as bio-indicator of pollution (Tripathi and Shukla, 1991).

Studies related to aquatic and wetland flora were globally studied earlier by Mirashi, 1954; Sen and Chatterjee, 1959; Vyas, 1964; Mishra, 1974; Baruah and Baruah, 2000; Deshkar, 2008; Chandra et al., 2008 and Aruna and Srinivas, 2013. Floristic list of a particular area gives a reliable background information about the species diversity in a community as each plant species has its own specific ecological amplitude and the same indicates the ecological nature of the habitat. In the present study, an attempt has been made to investigate the distribution and diversity of macrophytes from the selected lakes of Khammam district in Telangana State.

### **Materials and Methods:**

**Study site:** Khammam district lies between 16° 45' and 18° 35' North latitude and between 79° 47' and 80° 47' East longitude. The district presents a rough

topography with dissected uplands and hills which sometimes exceeds 600 m. Temperature varies from 10 to 44° C. The average rainfall of the district is 1045 mm. The district is rich source of rivers, lakes, ponds and reservoirs. The lakes selected for the present investigation are located in Paloncha region of Kothagudem.

**Data collection:** Survey was carried out during June 2013- May, 2014. During the study period macrophytes were collected from different sites of selected lakes of Kothagudem area such as Ooracheruvu, Chathakondacheruvu, Singhabupalemcheruvu and Chintalacheruvu. The aquatic macrophytes were hand pulled, collected into large polythene covers and were brought to the laboratory. These specimens were washed, dipped in 2% mercuric chloride, dried and were pressed on herbarium sheets. Local boat was also used while collecting plants from deeper water. Herbarium of each species was prepared by following standard herbarium techniques. The aquatic plants were identified with the help of available literature of Subramanyam (1962), Jain and Rao (1976), Varma (1981), Cook (1996), Majid (2000), and Choudhary (2002).

**Results and Discussion:** In the present study the macrophytic species recorded were grouped under different categories, i.e. floating, submerged and emergent forms based on habitat status. It was

observed that dicotyledons were dominant when compared to monocotyledons. Algae and Pteridophytes were poor in distribution. Scientific name, common name, family name habitat status and presence or absence in four different lakes is shown in Table 1- 3

**Table -1** represents Floating hydrophytes. The identified floating forms belonged to the families Nymphaeaceae, Lemnaceae, Salviniaceae and Pontederiaceae. *Azolla* and *Salvinia*, Pteridophytes were present in all the lakes investigated. Rooted floating leaved plant like *Azolla pinnata* and *Salvinia natans* were dominant in shallow water zones.

**Table-2** indicates Submerged forms. *Vallisneria* and *Hydrilla* species were dominant and showed luxuriant growth in almost all four lakes. The abundant growth of these forms was due to availability of nutrients and light.

**Table-3** depicts Emergent forms. The emergent forms identified majorly belonged to families, Cyperaceae and Poaceae. Some of the emergents like *Eclipta alba* and *Phyla nodiflora* were found on dry uplands. Most of the sedges and grasses were emergent and their growth declined in deeper waters.

It was observed that the emergent aquatic forms were abundantly found when compared to other forms. Submerged macrophytes release oxygen which add to the dissolved oxygen of the water. Thus aquatic macrophytes act as indicators of water quality, reduce pollution by acting as nutrient pumps and provide suitable breeding and shelter for varied aquatic fauna. It is presumed that emergent macrophytes are the most productive means of aquatic ecosystem since they utilize the roots in sediments beneath water and their photosynthetic parts in air, Westlake; 1963.

**List Of Macrophytic Species Recorded From Four Different Lakes:**

TABLE : 1 FLOATING FORMS						
SCIENTIFIC NAME	FAMILY	COMMON NAME	LAKE -1	LAKE -2	LAKE -3	LAKE -4
<i>Nymphaea pubescence willd.</i>	Nymphaeaceae	Water lily	+	-	+	+
<i>Azolla pinnata R. Brown.</i>	Salviniaceae	Water velvet	+	+	+	+
<i>Lemna minor Linn.</i>	Lemnaceae	Duckweed	+	+	-	+
<i>Eichhornia crassipes (Martius)</i>	Pontederiaceae	Water hyacinth	-	+	+	+
<i>Pistia stratoites Linn.</i>	Araceae	Water lettuce	+	-	+	-
<i>Salvinia auriculata Linn.</i>	Salviniaceae	Water fern	+	+	+	+
<i>Nymphaea stellata Willd.</i>	Nymphaeaceae	Dwarf lily	+	-	+	-
<i>Euryale ferox Salisb</i>	Nymphaeaceae	Prickly water lily	+	+	+	+
<i>Nelumbo nucifera Gaertn. Fruct</i>	Nelumbonaceae	Indian Lotus	-	+	+	-
<i>Spirodella polyrhiza Linn.</i>	Lemnaceae	duckweed	-	+	-	-

+ : Present - : Absent

TABLE : 2 SUMBERGED FORMS						
SCIENTIFIC NAME	FAMILY	COMMON NAME	LAKE -1	LAKE -2	LAKE -3	LAKE -4
<i>Ceratophyllum demersum</i> Linn.	Ceratophyllaceae	Horn wort	+	-	-	+
<i>Vallisneria natans</i> Linn.	Hydrocharitaceae	Eel grass	+	+	-	+
<i>Potamogeton pectinatus</i> Mique.	Potamogetonaceae	Pond weed	+	-	-	+
<i>Hydrilla verticellata</i> Linn.	Hydrocharitaceae	Hydrilla	+	+	+	+
<i>Chara zelanica</i> willd.	Charophyceae	Musk grass	+	+	+	+
<i>Nitella terestris</i> Agardh.	Charophyceae	Stone wort	+	+	-	+
<i>Ceratophyllum muricatum</i> Chamisso	Ceratophyllaceae	Horn wort	+	+	+	-
<i>Nitella hyalina</i> Agardh	Charophyceae	Stone wort	+	-	+	+
<i>Otella alsinoides</i> Linn.	Hydrocharitaceae	Dwarf morning glory	+	+	-	-
<i>Chara nitzii</i> willd.	Charophyceae	Musk grass	+	-	+	-
<i>Nechamandra alternifolia</i> (roxberg ex Wight )	Hydrocharitaceae	Eel grass	-	-	+	+

+ : Present - : Absent

TABLE : 3 EMERGENT FORMS						
SCIENTIFIC NAME	FAMILY	COMMON NAME	LAKE -1	LAKE -2	LAKE -3	LAKE -4
<i>Hygrophilla schulli</i> (schumach).	Acanthaceae	Marsh barbel	+	-	+	+
<i>Cyperus rotundus</i> Linn.	Cyperaceae	Flat sedge	+	+	+	+
<i>Typha angustifolia</i> Linn	Typhaceae	Bul rush	+	+	+	+
<i>Polygonum glabrum</i> Willd	Polygonaceae	Knot weed	-	+	+	-
<i>Marselia quadrifolia</i> Linn	Marseliaceae	Water clover	+	+	+	+
<i>Ipomea aquatica</i> Forsk	Convolvulaceae	Water spinach	+	+	+	+
<i>Alternanthera sessilis</i> L. R.Br	Amaranthaceae	Dwarf copper leaf	+	+	+	-
<i>Eclipta alba</i> Hassk'	Asteraceae	Bringhraj	+	+	+	+
<i>Striga densiflora</i> Benth	Scrophulariaceae	Witchweed	+	-	+	+
<i>Dentella repens</i> Linn	Rubiaceae	Creeping lickstooop	+	+	-	+
<i>Rumex dentatus</i> Linn	Polygonaceae	Toothed dock	+	-	+	+
<i>Phyla nodiflora</i> Linn	Verbenaceae	Turkey tangle	+	-	+	+

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<i>Cyperus campressus</i> Linn	Cyperaceae	Flat sedge	+	+	+	+
<i>Commelina benghalensis</i> Linn	Commelinaceae	Day flower	+	+	-	+
<i>Panicum miliaceum</i> L inn	Poaceae	European millet	+	+	+	+
<i>Echonochoa stagnina</i> (Retz )	Poaceae	Hippo grass	+	+	-	+

+ : Present ; - : Absent

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