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DIVERSITY OF AQUATIC MACROPHYTES IN NAGARAM POND AND DUBBAK POND OF SIDDIPET DISTRICT TELANGANA

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ABSTRACT

The aim of the present study is the aquatic macrophytes of Nagaram pond located in Boompally mandal in Siddipet district of telangana state,The present experiment work of identification of macrophytes was carried out during the period December 2022-February 2023.The aquatic macrophytes collected from site were identified and were categorizes as three life forms submerged, floating and emergent. The genera were recorded. Macrophytes comprises a taxonomically diversed groups of macrophytes plants including representative of vascular aquatic plants, Bryophytes, as well as green macroalgae and charophytes. An assemblage of macrophytic vegetation consists of emergent species whose vegetative parts emerge above the water surface submerged and floating species with each ecological group having specific features in morphology and physiologically processes. A wide range of the adaptive mechanisms developed by aquatic macrophytes at the morphological and physiological, biochemical levels enable them to inhibit various types of fresh water, brackish water and marine habitate. Macrophytes are an important componants of aquatic food web and perform a host of ecological functions in water ecosystem.

KEY WORDS: Aquatic macrophytes, Nagaram, Dubbak Ramasamudhram Ecosystem.

INTRODUCTION

The Aquatic Macrophytes are of considerable ecological and economic importance. Theycontribute significantly to the productivity of water bodies, mobilize mineral elements from the bottom sediments and provide shelter to aquatic invertebrates and fishes. They also respond to the changes in water quality and have been used as indicator of pollution in several cases. The sampling of aquatic macrophytes is a tedius work and depends on the type of habitat, type of vegetation, variation and distribution of vegetation. Studies related to aquatic and wetland flora were globally carried earlier by Sen and Chatarjee 1959; Subramanyan 1962; Vyas 1964; Mishra 1974; Boylen and Sheldon (1976), Srivastava et al, 1987; Baruah and Baruah 2000; Dhote and Dikshit 2007; Deshkar 2008; and Chandra et al, 2008. "Aquatic Macrophytes" is a term given to a vast category of aquatic vascular plants. In certain cases however the term has been used to include even the microscopic algae and member of the group Bryophyta. The Aquatic Macrophytes occur mainly in the hollow regions of lakes, ponds, pools, marshes, streames and rivers etc. Macrophytes colonize many different types of aquatic ecosystems, such as lakes, reservoirs, wetlands, streams, rivers and marine environments.

Aquatic macrophytes (often referred to as hydrophytes) constitute an assemblage of taxonomically diverse macroscopic plants whose life cycle takes place completely or periodically in the aquatic environment. Adaptive mechanisms evolved by macrophytes allow them to optimally respond to environmental heterogeneity and inhabit various types of aquatic habitats, including freshwater bodies, watercourses, wetlands, swamps, seasonally flooded areas, as well as brackish and marine environments. From a systematic point of view, aquatic macrophytic vegetation encompasses members of different groups, including green macroalgae (Chlorophyta, e.g. Cladophora spp.), charophytes (Charophyceae, e.g. Chara and Nitella spp.) and higher aquatic plants, the latter being represented by both vascular plants (Tracheophyta) and bryophytes.

According to some studies, macroalgae of the groups Rhodophyta and Xanthophyta can also be categorized as aquatic macrophytes. Vascular plants of aquatic ecosystems are significantly inferior to terrestrial tracheophytes in their diversity and abundance, accounting for only about 1% of the total number of vascular flora. It is estimated that aquatic tracheophytes are represented by 33 orders and 88 families, numbering about 2614 species in 412 plant genera. Most of aquatic vascular plants are represented by angiosperms (Magnoliopsida), but aquatic vegetation also includes representatives of the classes Polypodiopsida and Lycopodiopsida. A small percentage of gymnosperms have been recorded to date as those capable of growing in an aquatic environment, among which Retrophyllum minus (Pinopsida) was identified as the only obligatory inhabitant of aquatic habitats. Among bryophytes, aquatic species make up about 0.5% of all species, being found in all three divisions: Bryophyta, Marchantiophyta and Anthocerotophyta (mosses, liverworts and hornworts, respectively). According to the traditional point of view, representatives of aquatic vascular vegetation evolved from terrestrial plants that subsequently made a transition back to aquatic environments. However, some studies have provided evidence of the aquatic origin of several groups of aquatic angiosperms. Macrophytes, being an important part of various types of aquatic ecosystems, have a wide array of environmental functions and practical applications. The aim of this article was to analyze ecological groups and adaptation features of aquatic macrophytes, as well as their functional role in aquatic ecosystems.

MATERIAL AND METHODS

STUDY SITE:

Nagaram pond and Dubbak Ramasamudhram located at Dubbak Mandal, Siddipet District of Telangana State. This was chosen to study and document the diversity of Aquatic Macrophytes.

DATA COLLECTION:

Qualitative survey was carried out during the period December 2022-February2023. The aquatic macrophytes were collected on site some of them were directly pulled by hand; few were picked out with suitable aids and were placed into large polythene covers. They were brought to the laboratory, sorted out species wise, identified with the help of regional floras, standard taxonomic manuals and manuals of aquatic plants. A set of these specimens were vouchered number wise. Taxonomic description and identification characters were noted in filed notes and these specimens were preserved in the laboratory for herbarium purpose.

RESULT AND DISCUSION:

The Aquatic macrophytes collected during survey period were presented in Table 1 &2. In the present paper an attempt was made to explore the aquatic wealth of Nagaram pond and Dubbak pond with reference to aquatic macrophytes. In the present work macrophytes identified belonging to different families were recorded. It was observed that the emergent aquatic macrophytes were abundantly found when compared to submerged forms. Macrophytes release oxygen which adds to the dissolved oxygen of the water. Aquatic macrophytes act as indicators of water quality and reduce pollution also. Some aquatic plants are used by humans as a food source.

Examples include water caltrop (Trapa natans), Chinese water chestnut (Eleocharisduleis), Indian lotus (Nelumbo nucifera) and Water spinach (Ipomia aquatica). Few of the aquatic macrophytes collected from Nagaram pond and Dubbak pond are categorized as follow shown based on their habit.

Once the survey is complete and the sketched map of the lake's macrophyte coverage is finished, an estimate of acres or percent coverage can be done either by GIS applications or by hand. If done by hand, lay a see through grid pattern (approximately squares) over the entire map. Count plant-covered squares versus open lake squares to estimate percent coverage. Count partial squares until they equal one square. For example, two half-covered squares equals one, and three 1/3rd covered squares equals one. Apply this percentage to the known acreage of the lake to determine the acres of macrophytes. Once the plant coverage is known, use Best Professional Judgment and the extent of coverage to assess recreational impairment. Generally, a surface coverage of 40% or greater will impair the recreational use. For example, for a 100 acre lake with more than 40 acres of the lake OR shoreline covered with aquatic macrophytes, you have an indication of impairment. For larger lakes, assess only the percent surface coverage of the shoreline area because it is unlikely that a large lake will have any coverage offshore.

There are a few exceptions, as Pennsylvania does have some large shallow lakes. In these cases, the extent of lake management will be a factor in the amount of plant coverage and in the assessment of recreational impairment. In some larger state park lakes, only public access areas are treated to control macrophytes. However, in some private lakes, the entire shoreline might be treated. Macrophyte coverage can also be used to assess Aquatic Life Use. In this case, a 40% and greater underwater coverage indicates good habitat conditions and justification that the lake is meeting Aquatic Life Use. An underwater coverage of 10% or less indicates habitat impairment. Macrophyte coverage between 10% and 40% requires the reviewing biologist to consider other factors and can be used to support an impairment decision.

When using macrophyte coverage to assess lakes, consider the following factors. Take note of the presence and extent of invasive non-native species and the degree of weed management measures used by lake stakeholders (e.g, harvesting, application of herbicides or aqua shades, drawdowns, etc.). Non-native species can degrade habitat and limit native aquatic plants. Over-management of weeds reduces fish habitat and nursery areas, fosters algal blooms, and causes algal or sediment turbidity. However, judicious management can improve boating and swimming areas, while retaining fish habitat. Information on the extent of macrophyte treatment is usually helpful in making overall use determinations.

1. **SUBMERGED MACROPHYTES:**

In largely or completely submerged plants the roots may or may not be present. Potomogeton, Cerotophyllum, Vallisnaria). Most submerged aquatic macrophytes belong to the families Ceratophyllaceae, Haloragaceae, Hydrocharitaceae, Nymphaeaceae and Potamogetonaceae. These macrophytes are found in various types of water bodies, including estuaries, rivers, lakes, ponds, natural depressions, ditches, swamps and floodplains. Like other macrophytes, they compete with phytoplankton for nutrients, decreasing the productivity of the water and causing hindrance to the movement of fish, irrigation and navigation.

2. EMERGENT MACROPHYTES:

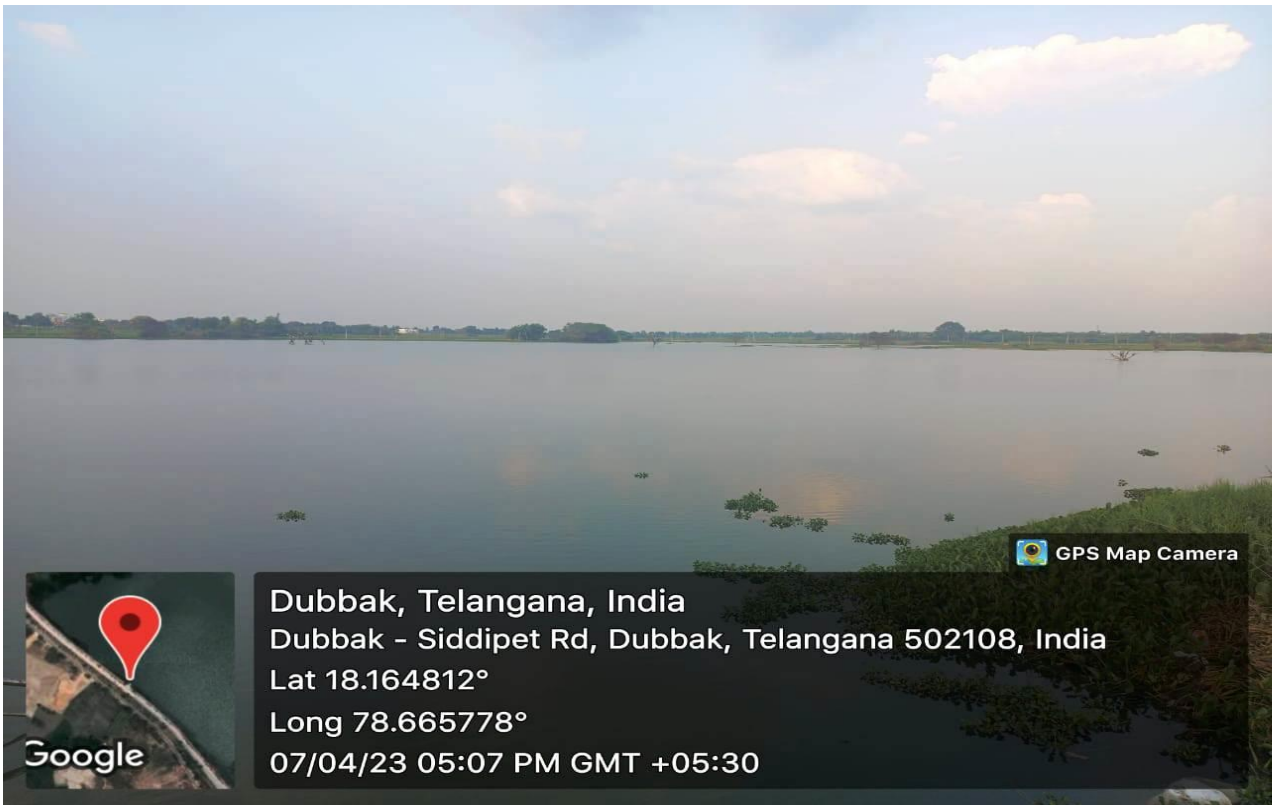
Plants not submerged in water they are further subdivided into two categories. Erect leafed Emergent plants: Rooted plants with principle photosynthetic surfaces projecting above the water (Typha, Skirpus, etc.)

→**Floating leaved emergent plants:** Rooted plants with floating leaves.

3. FLOATING MACROPHYTES:-

The crown of the plants floating on the water surface.

FIG 1&2 SHOWING THE NAGARAM POND AND DUBBAK POND



DIVERSITY OF AQUATIC MACROPHYTES IN NAGARAM POND AND DUBBAK POND OF SIDDIPET DISTRICT TELANGANA

TABLE 1. List of Macrophytes identified from Nagaram Pond

SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFE FORM
Chara	Scoring Rushes	Characeae	Submerged
Utricularia	Bladder worts	Lentibulariaceae	Submerged
Scripus cernuns	Fiber optics grass	cyperceae	Emergent
Nymphia pubescence	Water lilly	Nimpheaceae	Floating
Pistia stratiotes	water lettuce	Araceae	Floating

CHARA

UTRICULARIA

DIVERSITY OF AQUATIC MACROPHYTES IN NAGARAM POND AND DUBBAK POND OF SIDDIPET DISTRICT TELANGANA

TABLE 2. List of Macrophytes identified from Dubbak Pond

SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFE FORM
Ipomia carnea	Pink morning glory	Convolulaceae	Floating
Hydrilla verticillatae	Indian stargrass	Hydrocharitaceae	Submerged
Alternanthera Philoxeroids	Alligotorweed	Amaranthaceae	Aquatic
Mosquito ferns	Fairy moss	Salviniaceae	Aquatic
Sphagnam	Peat moss	Sphagnaceae	Aquatic

DIVERSITY OF AQUATIC MACROPHYTES IN NAGARAM POND AND DUBBAK POND OF SIDDIPET DISTRICT TELANGANA

ALTERNANTHERA PHILOXEROIDES

SPHAGNUM

AZOLLA

ECCHORNIA

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