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Quantification of the Flora and the Study of Ecological Succession at Ibalur Lake, Bangalore Using Sequential Aerial Photography

Mathews P Raj*and Sandhya Panicker

Department of Life Sciences, Jain University, Bangalore – 560027, Karnataka, India.

ABSTRACT

In the present study we studied and classified the vegetation of ibalur lake, Bangalore in relation to the ecological succession. Around thirty wild varieties of plant species were identified from the lake and classified into their respective families and the data compiled was in relation to the succession. Out of the thirty wild plant species ten plant species were proven to be noxious and invasive weeds indirectly responsible for the process of ecological succession. *Eichhornia crassipes* was found to be the problem for the death of the lake and the plant facilitating the growth of other higher plants and in turn leading to the process of ecological succession and the death of the lake. This slow process has lead to loss of habitat and the complete ecosystem.
Keywords: Ibalur Lake, Ecological succession, *Eichhornia crassipes,* Ibalur flora.

Corresponding author

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INTRODUCTION

Lakes are relatively small bodies of water which are surrounded by land on all sides, each lake sustains an ecosystem and provides an habitat for wide variety of flora and fauna, in the past recent years due to urbanization and anthropogenic activity lakes are being polluted and the human kind has suffered a drastic loss in preserving water and these water bodies on a whole. Apart from pollution there are several other causes which lead to destruction of these water bodies which may be unnoticed during the course of time, ponds are constant unlike oceans and they do not have any significant water currents and thereby prone to succession and subjected to geological disturbances (saiful Islam). Succession in an ecosystem is good but leads to tremendous change in landscape if left unnoticed over a period of time. Succession can change an entire geological land mass and cause a major problem in loss of habitat, extinction of flora and fauna and results in the vulnerability of some organisms and thus disturbing the homeostatic mechanism of mother earth [1-7].

MATERIALS AND METHODS

Field Trips

Field trips were carried out to the sampling site that is Ibalur Lake in the month of December, January and February. The lake was first divided into three areas or the study sites before the taxonomical data was collected. The divided areas or the zones were the park arena, the aquatic zone and the periphery of the lake.

Field Study

The plants which were well known earlier were recorded in the field data book. Photographs of every plant were taken during the field study. The common name and the scientific name of the identified plants were also recorded; the plants which were not identified were collected in plastic bags along with the reproductive organs basically the flowers. The plants which were collected were identified in the laboratory with the help and guidance of the experts. The plants were classified to their respective families and the genus and also species level were well characterized, flora of madras by J.S Gamble was referred wherever necessary even the artificial taxonomical keys were also referred. The plants were studied, and data was compiled with respect to their habitat and with regard to the ecological succession featured by some plants.

Data compilation

Plants were identified and entered into the field data book with the common name, their scientific names and their respective family names. Around twenty seven plants basically of the wild variety were only identified and the taxonomic characters were collected from various sources like books, flora of madras and various websites were looked into before the data was compiled. Engler and Prantl system of taxonomic classification were followed and all the identified plants were classified accordingly. The economic importance of the plants their invasiveness were also recorded. Photographs of every plant were included along with the taxonomic data collected. The plants were categorized into

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herbs, shrubs, trees and aquatic habitats. Their involvement in the process of ecological succession was also interpreted. The dominant plant species growing in and around the lake were categorized for the purpose of understanding the concept of ecological succession. The results and interpretation were done by collective documentation of data, photographs and bar graphs.

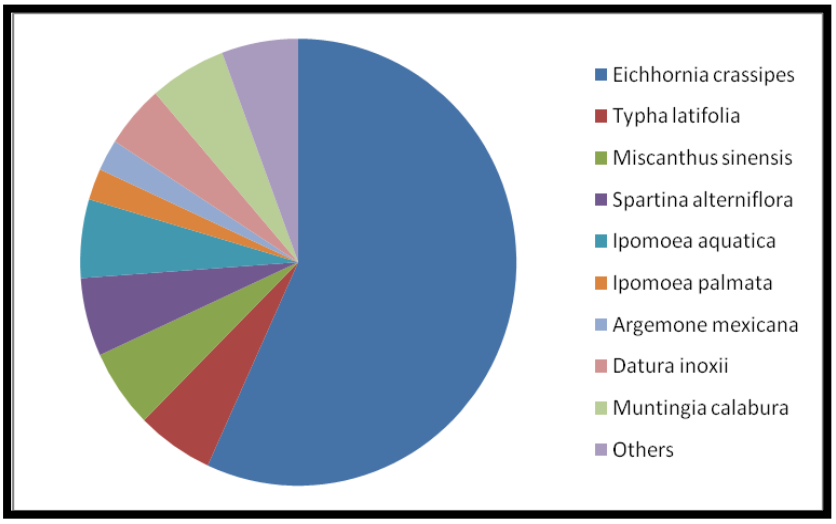
RESULTS

Around twenty seven plant species were identified and data was collected on the same:

Eichornnia crassipes, *Argemone Mexicana*, *Solanum indicum*, *Muntingia calabura*, *Alternanthera sesssilis*, *Pithecellobium dulce*, *Spartina alterniflora*, *Sorghastrum mutans*, *Oxalis corniculata*, *Parthenium hysterophorus*, *Ricinus communis*, *Lantana camara*, *Tridax procumbens*, *Marrubium vulgare*, *Malvaviscus penduliflorus*, *Hamelia pattens*, *Ipomea aquatic*, *Ipomea palmata*, *Amaranthus cruentus*, *Iresine herbstii*, *Bignonia sp.*, *Giant maiden grass*, *Datura inoxii*, *Typha latifolia*, *Euphorbia milii*, *Acalypha hispida*, *Bamboo sp.*

SL NO.	AQUATIC PLANT	HERBS	SHRUBS	TREES
01	*Eichornnia crassipes*	*Spartina alterniflora*	*Argemone Mexicana*	*Pithecellobium dulce*
02	*Ipomoea aquatica*	*Sorghastrum nutans*	*Alternanthera sesssilis*	*Muntingia calabura*
03	*Ipomoea palmata*	*Oxalis corniculata*	*Ricinus communis*	*Bignonia sp.*
04		*Solanum indicum*	*Acalypha hispida*	
05		*Iresine herbstii*	*Euphorbia milii*	
06		*Parthenium hysterophorus*	*Lantana camara*	
07		*Tridax procumbens*	*Hamelia pattens*	
08		*Marrubium vulgare*	*Malvaviscus penduliflorus*	
09		*Typha latifolia*	*Bambuseae*	
10		*Amaranthus cruentus*	*Miscanthus sinensis*	
11			*Datura inoxii*	

Table-1 indicating the number of plants identified in Ibalur Lake



Graph/Piechart - 1 indicating the dominating plant species of ibalur lake leading to ecological succession

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Eichhornia crassipes

Spartina alterniflora

Miscanthus sinensis

Ipomoea aquatica

Muntingia Calabura

Typha latifolia

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DISCUSSION

The lake was continously studied for three months and it was noticed that ecological succession was one of the major reason for the death of the lake. The physico chemical analysis of the lake water proved that the lake is highly eutrophic, it had extreme limits of pollutants and a very high phosphate content, the lake recieves sewage from one end whereas the remaining parts of the lake has been used as garbage dumpyards.which has increased heavy metals and other major and minor nutrients leading to algal blooms, the lake water is completely covered with aquatic weed *Eichhornia crassipes* which prevents the entry of sunlight into the lake and has caused the death of aquatic life forms giving rise to an unpleasant odour, over the period this phenomenon has decreased the water content making way for other higher plants like *Miscanthus sinensis,Spartina alterniflora, Parthenium hysterophorus,ipomoea aquatica,* etc these mentioned higher plants facilitates burrowing of the soil, reduces water content and helps in germination of seeds of higher plant families. The lake also has some trees growing around its vicinity like *Muntigia calabura, Pithecellobium dulce etc.*these trees has been proven to occupy wetland areas and makes way for the growth of water resistant plants like *oxalis corniculata, Lantana camara, Argemone mexicana, Ricinus communis* and others which are again proven to be noxious and invasive. The lake has been ruled over by succession for a past few years, and if still left unnoticed and unmaintained will change the entire landscape leaving the memories of the lake and snatching away an entire habitat of avifauna, aquatic life and land organisms which are dependent on them.

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