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MANGROVE SPECIES DIVERSITY IN ARIYANKUPPAM ESTUARY, PUDUCHERRY, INDIA

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ABSTRACT

True mangrove species and associate mangrove species are the two categories into which the plant life in a mangrove habitat is divided. While associated species are present in both the mangrove ecosystem and its environs, true mangrove species are exclusively found in mangrove wetlands. There are 69 plant species recognized to be true mangroves worldwide. The present study aim to find out the true mangrove diversity in Ariyamkuppam, Puducherry. Six true mangrove floral species from three families, three orders, and the same class were recorded. One true mangrove was threatened Species in IUCN Red data book.

Key words: Mangroves, IUCN, Diversity

INTRODUCTION

Humanity depends on ecosystems for various functions, such as the provision of food, the cleansing of the water and air, and the mitigation of climate change. The loss of global diversity brought about by human activities like urbanization, agriculture, and aquaculture threatens these ecological functions. One of the most productive natural wetlands in the intertidal region in tropical and subtropical parts of the world is the mangrove ecosystem (Chaudhuri and Choudhury, 1994). According to the widely accepted definition, ecosystem services are the advantages that ecosystems offer to people and which help to make life on Earth both possible and worthwhile (Millennium Ecosystem Assessment, 2005, Layke *et al.,* 2012, Johnston and Caretti, 2017). Mangroves are unique halophytic plants found in tropical and subtropical coastal regions of around 123 nations. They arise at the interface of terrestrial, estuarine, and marine systems (Stiepani *et al*., 2021; Omar and Misman, 2023; Ruslan *et al*., 2022)

World

Since 1996, a net 5,245 km^2 of mangrove forest has been lost due to a combination of hard to control changes brought on by erosion, floods, or storms, as well as direct human influences such clearing and conversion. Action is still necessary to stop additional loss, protect what is left, and restore what has been lost, even if average losses over the past ten years have decreased to 0.04% per year and there have been significant gains at river mouths and deltas. The coverage of mangroves in the year of 2022 is 61,287 Km^2

India

Mangroves encompass 4740 km^3 in India, which makes up roughly 3% of the total mangrove cover worldwide. The world's largest mangrove forest, the Sundarbans in India and Bangladesh, is also the only mangrove forest where Royal Bengal tigers and other internationally threatened animal species have established colonies. Of the two mangrove genetic paradises in the world, the Indian mangroves are located in Bhitarkanika, Odisha. Mangroves in India can be broadly classified into three types: insular, deltaic, and backwater-estuarine. About 58 % of the mangroves occur on the east coast along the Bay of Bengal, 29 % on the west coast bordering the Arabian Sea, and 13 % on Andaman and Nicobar Islands Sundarbans mangrove estuary, which is one of the most dynamic and productive ecosystems in the world, are very suitable for urban and industrial activities, the coastal areas of this ecosystem are constantly exposed to metal contamination. (Kathiresan Kandasamy.2017).Over the past twenty years, Indian mangroves have remained relatively intact despite increasing threats from both natural and man-made disasters. India is host to 6740 km2 of mangroves, of which 80% are found along the country's eastern coast while the remaining 20% are found along its western coast. Recent increases in urbanization are creating a shadow of decline over these important mangrove regions, which could result in fast changes to the environment in many areas (Giri *et al*., 2015). Tremendously contribute to strengthening conservation tactics, guaranteeing the preservation of these mangroves, which are extremely valuable to the local populations economically, and preserving the environment's overall ecological balance ((Bindiya *et al*., 2023).

Mangrove forests can be found along the Tamil Nadu coast in the Pichavaram and Muthupet areas. About these two mangrove ecosystems, a great deal of scientific study covering all angles has been conducted and published. Nevertheless, there is a limited of information on the existence and significance of the mangroves in Pondicherry. Understanding the abundance and health of the mangroves in Pondicherry, Ariyankuppam, is made easier by giving priority to assessment studies based on the preliminary study of the diversity of mangrove species now in existence.

MATERIALS AND METHODS

Study area

The study region is located between latitudes 11°46'03" and 11°53'40" North and longitudes 79°49'45" and 79°48'00" East, Ariyankuppam estuary, Puducherry, India and the water way is a tributary of the river Gingee. On the coast of the Coromandal, a tide-dominated estuary comes into the Bay of Bengal. The tidal amplitude varies with the lunar phase and averages between 20 and 70 cm, peaking throughout the northeast monsoon. The climate is sub-humid, with an average temperature of 28.8°C and relative humidity between 65-75%.

METHODOLOGY

The first places to be identified and recorded are those surrounding the Ariyankuppam backwater in the Pondicherry region where mangroves present. With the aid of survey maps of the village of Ariyankuppam, which are available from the Department of Survey and Land Records, Government of Pondicherry, the study area is located. Regular field visits were used to map out the routes to various points along the waterway.

For the assessment of present biodiversity status, the mangroves, were plucked during their flowering seasons for prompt identification. All the specimen collected for identified by an expert taxonomist Dr.T.Ramanathan, Associate Professor, CAS in Marine Biology, Faculty of Marine Sciences, Annamalai Uinversity, Parangipettai, Tamilnadu.

The coastal environment biological diversity and ecosystem functions are rich, which serves as a catalyst for the creation of resources and services that are vital to human populations. Thus, maintaining these unique coastal habitats commercially valued living resources depends heavily on biodiversity conservation. The Biodiversity Convention Act recognizes the hierarchy at the genetic, taxonomic, and ecosystem levels and states that biodiversity is the foundation for human survival. It includes all life forms, ecosystems, and ecological processes. Both the varied flora and fauna of the Pondicherry mangrove ecosystem contribute to its richness at the taxonomic level.

RESULTS AND DISCUSSION

Around the study area, six real mangrove floral species from three families, three orders, and the same class were recorded. Table 1 and Figure 1 give a categorized list of the true mangrove vegetation that has been identified. Of these six species, two, *Rhizophora apiculata* and *Rhizophora mucronata,* were introduced to this habitat in 1995 by the Department of Agriculture, with assistance from the Center for Advanced Studies in Marine Biology at Annamalai University, as part of a social forestry project. In Ariyankuppam, *Avicennia marina* is the predominant mangrove species. *Bruguiera cylindrica* is the next dominant species in the group. *Acanthus ebracteatus* and *Acanthus illicifolius* also found in Ariyankuppam. IUCN status (Red Data Book) of the recorded mangroves *Avicennia marina* was included in the Threatened Species. Other five mangroves were in least concern (LC).

The following table-1 provides a detailed presentation of the mangrove species diversity that were identified throughout the study period and Figure-1 shows the photographs.

Table-1 True Mangrove Species identified in Ariyamkuppam Village, Puducherry.

Scientific Name	Tamil Common name	Class	Order	Family	IUCN status
Acanthus ebracteatus. Vahl		Dicotyledonae	Personales	Acanthaceae	Least Concern (LC)
*Acanthus illicifolius.*L	Attumulli, Kozhimullu	Dicotyledonae	Personales	Acanthaceae	Least Concern (LC)
Avicennia marina	Venkandal	Dicotyledonae	Labiales	Avicennaceae	Threatened Species
Bruguiera cylindrica.(L).Bl	Pannikuchi	Dicotyledonae	Myrtales	Rhizophoraceae	Least Concern (LC)
Rhizophora apiculata. Blume	Kandal	Dicotyledonae	Myrtales	Rhizophoraceae	Least Concern (LC)
Rhizophora mucronata		Dicotyledonae	Myrtales	Rhizophoraceae	Least Concern (LC)

Figure-1 True mangroves in Ariyankuppam, Puducherry

Acanthus illicifolius.

Acanthus ebracteatus

Avicennia marina

Bruguiera cylindrical

Rhizophora apiculata

Rhizophora mucronata

The present species diversity of mangroves in Ariyankuppam Estuary, Puducherry is compared to nearby mangrove forests Muthupet and Pichavaram, Kathiresan (2000) stated there are 73 species of mangrove-associated vegetation and 13 true mangrove species in Pichavaram mangrove forest. Approximately 190 km and 175 km south of the Pondicherry mangroves, Balu *et al*. (1998) observed 8 true mangroves, 10 mangrove associates from Muthupet and 9 true mangroves, 13 mangrove associates from Point Calimere. The Pondicherry region is habitat to 13 different species of mangrove vegetation, include mangrove allies reported by NBSAP (2002).

CONCLUSION

The present study revealed that six true mangroves were present in the Ariyankuppam estuary, Puducherry, A Uninon territory, India. Avicennia marina is the most common mangrove species in Ariyankuppam. The group's next dominant species is Bruguiera cylindrica. Ariyankuppam is also home to Acanthus ebracteatus and Acanthus illicifolius. The documented mangroves, Avicennia marina, were listed as Threatened Species in the IUCN Red Data Book. Least concern remaining five mangroves (LC).

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