

# Study of Invasive Species, Assessment of Risk Factors And Management

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**Abstract-** Invasion by alien species of plants are considered as one of the major threats to the diversity of natural ecosystem. The better understanding of impacts of invasive plants on our natural vegetation, the better equipped we will be to implement effective management. Quantitative analysis and categorization of invasive species based on their risk factors they possess provide better practices that have to be undertaken by the society and government.

## I. INTRODUCTION

Biological invasions cause ecological and economical impacts across the globe. Invasion by alien species of plants are considered as one of the major threats to the diversity of natural ecosystem. It is the second most important reason for biodiversity depletion across the world. To address this key issue in invasion biology, quantitative studies on the invasive plant species of Kannur district has been undertaken in the current project. Phytosociological analysis provides an opportunity to explore the invasive plants quantitatively and assess their present status. The current study aims to determine how the magnitude and direction of invasive species impacts vary across levels of ecological complexity (Gaertner et.al, 2009).

## II. METHODOLOGY

The quadrat methods have been used for the purpose of studying phytosociology (Shukla & Chandel). For each of the selected sites, the total count of individuals of each species and mean value of individuals of a species per plot were determined for the study. The numerical data obtained were analyzed to find out the phytosociological measures such as density, frequency and abundance.

Study sites were selected by using stratified random sampling method. Ten quadrates of 1 m x 1 m size were established in each study sites at random. All invasive plants in each quadrat were identified, counted and recorded. The species thus listed were checked against the catalogue of the Native flora. The invasive plants were then subjected to the

**Invasive species Risk Assessment**, as per the invasive species protocol developed by the nature serve, Virginia, U.S.

## Study Areas across Kannur District, Kerala



Location Map of Kannur District, Kerala

Table 1: Selected Study Sites

Mattool	Mottammal
Karinkalkuzhi	Kuttiyattoor
Madukkoth	Valankichal
Chalad	Thazhechovva
Pathayakurmu	Thoniyottukvu
Kudukkimotta	Kuyyali

## III. RESULTS

### Quantitative Analysis

The distribution of invasive plants in twelve different locations (Table 1) (Chart 1) was studied in different Grama Panchayath of Kannur district. A total of 45 invasive plants were recorded from 18 families. Density, Frequency and Abundance of invasive species significantly varied between different study sites.

*Chromolaena odorata* was recorded in the 11 study sites and have the highest relative density of 13.99 and highest relative frequency of 7.63. *Sphagneticola trilobata* was

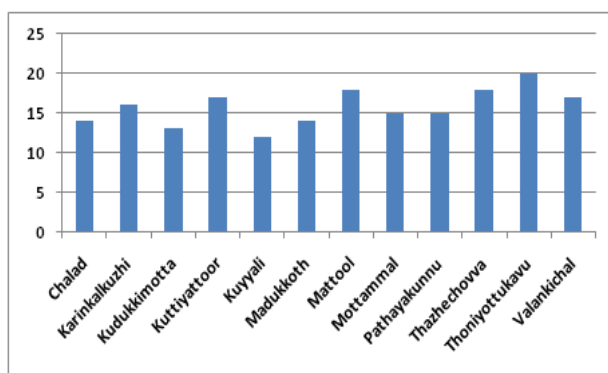
dominated in 10 study sites and having the relative density of 9.34 and highest relative frequency of 6.90. *Mimosa pudica* dominated in 7 study sites with relative density of 9.34 and relative frequency of 5.32. *Alternanthera bettzickiana* dominates in 9 study sites and having relative density of 6.28 and relative frequency of 3.74. *Tridax procumbens* dominates in 5 study sites and having relative density of 6.13 and relative frequency of 4.17.

From the this study it is revealed that the plants : *Ageratum conyzoides*, *Alternanthera bettzickiana*, *Chromolaena odorata*, *Ipomea cairica*, *Lantana camara*, *Merremia vitifolia*, *Mikania micrantha*, *Mimosa diplotricha var. diplotricha*, *Mimosa diplotricha var. inermis*, *Mimosa pudica*, *Pennisetum pedicellatum*, *Pennisetum polystachyon*, *Sida acuta*, *Sphagneticola trilobata*, *Tridax procumbens* are identified as high risk category of invasive plants of which call for urgent attention in terms of control and management.

The low risk category plants recorded from the study area- *Amaranthus spinosus*, *Caladium bicolor*, *Centratherum intermedium*, *Croton bonplandianus*, *Croton hirtus*, *Gomphrena celosioides*, *Hyptis capitata*, *Leucaena leucocephala*, *Pteridium aquilinum*, *Quisqualis indica*, *Ricinus communis*, *Senna alata*, *Senna siamea*, *Sesbania bispinosa* and *Tithonia diversiflora* impose huge costs in terms ecological destruction and economic damage.

Governments, and land-owners as well as general public, could profit from the outcomes of this study. Furthermore, this study will help to show that the diversity of habitats that an invasive plant can occupy could be useful parameter in models predicting that impact of species in an ecosystem.

**Chart showing total number of invasive plants in selected study sites**



**Table No.17: Risk analysis of invasive plants in the study area**

Sl.No.	High Risk	Medium Risk	Low Risk
1	<i>Ageratum conyzoides</i>	<i>Alternanthera brasiliana</i>	<i>Amaranthus spinosus</i>
2	<i>Alternanthera bettzickiana</i>	<i>Antigonon leptopus</i>	<i>Caladium bicolor</i>
3	<i>Chromolaena odorata</i>	<i>Argemone mexicana</i>	<i>Centratherum intermedium</i>
4	<i>Ipomea cairica</i>	<i>Bidens sulphurea</i>	<i>Croton bonplandianus</i>
5	<i>Lantana camara</i>	<i>Calopogonium mucunoides</i>	<i>Croton hirtus</i>
6	<i>Merremia vitifolia</i>	<i>Centrosema molle</i>	<i>Gomphrena celosioides</i>
7	<i>Mikania micrantha</i>	<i>Euphorbia heterophylla</i>	<i>Hyptis capitata</i>
8	<i>Mimosa diplotricha var. diplotricha</i>	<i>Hyptis suaveolens</i>	<i>Leucaena leucocephala</i>
9	<i>Mimosa diplotricha var. inermis</i>	<i>Ludwigia peruviana</i>	<i>Pteridium aquilinum</i>
10	<i>Mimosa pudica</i>	<i>Parthenium hysterophorus</i>	<i>Quisqualis indica</i>
11	<i>Pennisetum pedicellatum</i>	<i>Pueraria phaseoloides</i>	<i>Ricinus communis</i>
12	<i>Pennisetum polystachyon</i>	<i>Racosperma auriculiforme</i>	<i>Senna alata</i>
13	<i>Sida acuta</i>	<i>Senna tora</i>	<i>Senna siamea</i>
14	<i>Sphagneticola trilobata</i>	<i>Synedrella nodiflora</i>	<i>Sesbania bispinosa</i>
15	<i>Tridax procumbens</i>		<i>Tithonia diversiflora</i>
Total	15	14	16

## REFERENCES

- [1] Gaertner, M., Breegeri. A.D, Hui, & C. Richardson D.M.(2009). Impacts of alien plant – invasion on species richness in Mediterranean type ecosystems- a Meta analysis. *Progr.Phys.Georgo.* 33, 319-338.
- [2] Shukla, R.S., & Chandel,P.S. *Plant Ecology* (2005). S.Chand & Company Ltd. NewDelhi.113-145.