



# Invasive Alien Flora & its impact found in Vadoda range forest, Muktainagar, MS, India

Patil Geeta P<sup>1</sup> Jagtap Sanjay<sup>2</sup>, Sharma CT<sup>3</sup>, Tayade Rupali<sup>3</sup>

<sup>1</sup>Assistant Professor, Department of Botany | <sup>3</sup>Assistant Professor, Department of Zoology, Arts, Commerce and Science College, Bodwad. Dist. Jalgaon, MS, India

<sup>2</sup>Associate Professor, Elphinston College, Mumbai. MS, India

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## ABSTRACT

An Alien plant is those who are non native, exotic to a specific area or location & destroy the existing biodiversity & affect the indigenous flora. Some alien species has tendency to spread in such degree that it become invasive and causes damage to the existing environment, economy & human health. The present study deals with the comprehensive list of Invasive, alien plants of Vododa Range forest, Muktainagar with information of family, habit, nativity etc. More than 70% flora found in forest is exotic. Among these dicotyledons contribute more than monocotyledon. Vegetation includes total 74% alien species under 32 families. Among 12 different geographical regions, the majority of invasive plants reported from Tropical Africa (30%) with 25 species. Habit wise analysis shows that about 55.04% of species are herbs, 17.5% are shrubs & 20.27% are trees & 9.45% are climbers. *Cassia uniform*, *Hyptis suaveolens*, *Altenathera*, *Tridax procumbens*, *Lantana camera*, *Triumpheta*, *Apluda*, *Alysicarpus* etc. are some noxious species found during the study. *Cassia uniflora* is the highly noxious plant which is found everywhere.

**Keywords:** Alien, Invasive, Exotic, Geographical region.

## INTRODUCTION

International Union for Conservation of nature & Natural Resources (IUCN) define alien invasive spp. "As an alien species which becomes established in natural & semi natural ecosystem or habitat as agent of change & threatens native biological diversity. Intentionally or accidentally plants are introduced from one region to another new area or environment. Intentionally Human beings for their need introduce some plant across countries & continents. These introduced species are called alien species or exotic species. Some of alien species has tendency to spread in such degree that it occupies most of the land & causes damage to the existing native species or replaced native flora of that region. It also leads to the destruction of native biodiversity & become invasive. The frequency of introduction of alien plant species increased in the areas

where human interference is more such as forest fragmentation (Higgins *et al.*, 1996). This invasion has been recognizing as the second worst threat after habitat destruction to the biodiversity. (Hobbs *et al.*, 1995).

Invasive alien species have the potential to grow in any environment & easily spread to the new environment. Preston & Williams stated that "Invasive alien plant species are grown in such a way that they become as more dangerous to sustainable development." The entire world is facing the same problem of invasion of alien species which can be harmful to the native ecosystem. Many countries took initiatives to control or eradicated the invasive species & prevent their introduction.

Vadoda range forest is located in Muktainagar tahsil which is a part of Jalgaon district & located on north eastern side of Jalgaon district. The forest is situated around Satpuda mountain range. The forest is mainly dry deciduous type. It is lying between 20 degree & 21-degree North latitude & 74° 55' & 76°28' East longitude. The forest is located near the boundary of Maharashtra, MP & right bank of Purna river. The common characteristics of invasive species through which they can easily spread are fast reproduction rate, high dispersal ability, easily adapted to new environment & survive on various ecosystems etc. After establishment they can change the structure & composition of soil of that area.

To solve the problems associated with this invasive species is to firstly collect proper data about their growth form, life cycle & invasion status. It is necessary to undertaken survey of the invasive flora of forest region which may be useful in future, because many species may become endangered & then conservation should be necessary.

## MATERIALS AND METHODS

During August 2017 to February 2019 an intensive floristic survey was done in different beats of Vadoda range forest of Muktainagar. Each location was studied in every season of the year. Information was collected & a comprehensive list of invasive alien plants were made using the available floras Cooke (1901-1908), Cooke, (1967), Dhore (2002), Hooker (1904), Naik (1998) literatures & communication with experts. The

nativity, botanical name, family, habit, uses etc. were noted Reddy (2008), Deshmukh *et al.*, (2012), Wagh and Jain (2015). Also, plants were categorized according to their life forms as herbs, shrubs, climber & trees. The Westland, lakes & ponds, roadsides etc. were the studied habitats.

## RESULTS AND DISCUSSION

About 12 different geographical regions are recorded in this study which is responsible for the introduction of alien species in the Vadoda range forest area. They are Tropical America, Central America, North America, South America, Tropical Africa, Australia, Shrilanka, West Indies, East Indies, China, Mexico and Saudi Arabia.

It is observed that many species like *Prosopis juliflora*, *Lantana camara*, *Hyptis suaveolens*, *Altenathina sessules*, *cassia unflora* etc. one dominant in this forest. During investigation it is also noted that more than 70% population of exotics were found in dry region. This is harmful to the biodiversity of that area. Impact of these alien species shows displacement of native plant species, changes in soil structure, reduces the reproductive rate of Indigenous flora.

A total 74 invasive alien plant species belonging to 66 genera and 32 families have been recorded from the Vadoda range forest, Muktainagar. From the study it was found that 41 species (55.4%) were herbs followed by trees with 14 species (18.91%), Shrub 10 species (13.51%), Climbers 05 species (6.75%) and under shrubs 03 species (4.05%). The habit distribution analysis as shown in Table1 shows that Herbaceous species were dominant than other life forms.

From the taxonomic distribution of alien species as shown in Table-2, Family Poaceae (08) showed dominant impact in this forest area followed by Asteraceae(07), Malvaceae, Papilionaceae, Mimosaceae (05), Caesalpinaceae, Amaranthaceae and Lamiaceae (04) and Capparaceae (03). These nine families contributed major of the total invasive plant species studied. Family Poaceae was the most dominant invasive family as compared to other families. Due to its high reproductive potential, adaptive nature and high dispersal mechanism of seeds in new area through wind, air and water, it establishes itself easily and become invasive in a new environment.

**Table 1: Habit wise List of Invasive Alien Plant species at Vadoda range forest Muktainagar**

Sr. No.	Habit	No. of Species
1	Herbs	41
2	Shrubs	10
3	Trees	14
4	Under Shrub	03
5	Climbers	05

**Table 2: Total No. Of invasive Alien Species distributed family wise at Vadoda range forest Muktainagar**

Sr. No.	Family	No. of Species
1	Poaceae	08
2	Asteraceae	07
3	Papilionaceae	05
4	Convolvulaceae	02
5	Polygalaceae	01
6	Amaranthaceae	04
7	Euphorbiaceae	02
8	Oxalidaceae	01
9	Malvaceae	05
10	Nyctaginaceae	01
11	Caesalpiniaceae	04
12	Verbenaceae	02
13	Celastraceae	02
14	Ebenaceae	02
15	Lamiaceae	04
16	Mimosaceae	05
17	Capparaceae	03
18	Combretaceae	01
19	Oleaceae	01
20	Boraginaceae	01
21	Zygophyllaceae	01
22	Rhamnaceae	01
23	Acanthaceae	01
24	Menispermaceae	02
25	Moraceae	01
26	Rutaceae	01
27	Lythraceae	01
28	Schrophulariaceae	01
29	Anacardiaceae	01
30	Hydrocharitaceae	01
31	Asclepiadiaceae	01
32	Ulmaceae	01

**Table-3 Different Geographical nativities of the invasive Alien plants at Vadoda range forest Muktainagar**

Sr. No.	Nativities	No. of Species
1	Tropical America	09
2	Central America	07
3	North America	05
4	South America	05
5	Tropical Africa	25
6	Australia	08
7	Shrilanka	05
8	West Indies	01
9	Mexico	01
10	Saudi Arabia	01
11	China	04
12	East Indies	01

Different geographical nativities of invasive alien species are shown in Table 3. Among 12 geographical regions the Major geographical regions of invasive alien plants were Tropical Africa 25 species, Tropical America 09 species, Australia 08 species, Central America 07 species, North America, South America and Shrilanka 05 species, China 04 species, West Indies, East Indies, Mexico and Saudi Arabia 01 species.

### CONCLUSIONS

Alien plant species which are introduced intentionally or unintentionally to a new area become invasive in that area and disturb the existing Indigenous Flora and hence changes the native Ecosystem. It also affects the composition of soil, nutrient capacity etc. Some invasive species affects the human health also. Hence it needs to create awareness among people to protect and conserve Biodiversity of Forest area. Invasive alien plant species in Vadoda range forest is a threat for the Indigenous flora due to their fast adapting and colonizing ability. Precaution should be taken by the Forest Department regarding introduction of alien species in forest area.

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### Conflict of interest

The authors declare that they have no conflict of interest.

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