

Invasive Plant Species of Rajasthan and their Impact on Natural Habitat

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Abstract: Many invasive plant species are non - indigenous that spread fast and interferes in a new ecosystem by posing a dangerous threat to the native biodiversity. These exotic species do not allow the local species to grow naturally. They are affecting local flora, causing economic loss and harming human health. Some notable such type plant species of Rajasthan state are considered in this communication.

Keywords: Deciduous; Exotic; Flora; Indigenous; Invasive, Tropical

1. Introduction

Some exotic angiosperm plant species of dicotyledons and monocotyledons grow and spread fast and check the growth of native plant species. *Prosopis juliflora* (Swartz) DC, *Parthenium hysterophorus* L., *Ipomoea carnea* subsp. *fistulosa* (Mart. ex Choisy) D. F. Austin., *Lantana camara* L., *Lantana veronicifolia* Hayek, *Pontederia crassipes* Mart. and *Alstoniascholaris* (L.) R. Br. are some notable examples which are considered as noxious invasive exotic weeds. They causes several negative impact on native ecosystem of many areas of state.

Dense growth of these exotic species degrading the natural habitat of many indigenous angiosperms and pteridophytes plant species. *Pontederia crassipes* Mart. is considered most notorious aquatic weed. Its dense growth is degrading the natural habitat of many wetland areas. *Lantana camara* L., *Lantana veronicifolia* Hayek are causes allelopathic effects and check the growth of other plant species. *Prosopis juliflora* (Swartz) DC and *Parthenium hysterophorus* L. are most common exotic hazardous species which found almost everywhere and around the year.

Rajasthan is the largest state of India in area. It is lying between 23° 30' and 30° 11' N latitude and 69° 29' and 78° 17' E longitude. It is almost rhomboidal in shape. The presence of Thar desert in its western portion makes it a unique state of the country. Many parts of Rajasthan are included in the arid and semi - arid regions. The vegetation of the Rajasthan state is mainly tropical dry deciduous and tropical thorny types. The dominant trees and shrubs species of the state are *Acacia nilotica*, *Acacia catechu*, *Acacia leucophloea*, *Adhatodazeylanica*, *Anogeissus pendula*, *Aegle marmelos*, *Azadirachta indica*, *Balanites aegyptiaca*, *Bauhinia racemosa*, *Bombax ceiba*, *Butea monosperma*, *Calotropis procera*, *Capparis decidua*, *Capparis sepiaria*, *Cassia fistula*, *Cassia siamea*, *Dalbergia sissoo*, *Dichrostachys cinerea*, *Ficus religiosa*, *Ficus glomerata*, *Ficus benghalensis*, *Grewia flavescens*, *Manilkara hexandra*, *Mitragynaparvifolia*, *Phoenix sylvestris*, *Prosopis cineraria*, *Salvadora persica*, *Salvadora olioides*, *Tecomella undulata*, *Vitex negundo*, *Ziziphus mauritiana* and *Ziziphus nummularia*. In the present paper, an attempt has been made to record and enumerate the invasive plant species of

Rajasthan state and their impact on natural habitat and indigenous plants.

2. Material and Methods

Important studies on the floristic and ecological work of various part of India have been made by Mathur (1960), Champion and Seth. (1968), Bhattacharya, Bose, Dutta, Ray and Guha (1979), Sharma (2002), Pandey and Dilwaker (2008), Sujana and Sivaperuman (2008), Kumar (2012), Sikarwar (2014), Jadhav (2016) and Sharma (2019, 2021 and 2022). Invasive plant species of Rajasthan state and their effects on ecosystem and natural vegetation have been described in present communication.

The present study is based on field observations during 2020 to 2022. An attempt has been made to record and observe the exotic plant species of area. Exotic species have severe impacts on growth rate and survival ship of many angiospermic and pteridophytic species. Extensive surveys were conducted of area in different seasons to assess the invasive plant species of different families of dicotyledons and monocotyledons. During investigation seven common invasive exotic plant species were observed which are enumerated in this article.

3. Results and Discussion

Invasive exotic species causes negative impact on natural life form, phenology and ecological niche of various plant species. Seven invasive angiosperms plant species are enumerated in present communication which are arranged alphabetically.

1. *Alstoniascholaris* (L.) R. Br.

Family: Apocynaceae

Morphological description: A medium sized to large tree, glabrous, surface grey - brown, shallowly fissured. Leaves simple, whorled, leathery, margin entire. Flower bisexual, greenish - white in terminal umbellate cymes, fragrant. Fruit follicles pendulous, narrowly cylindrical, linear, green, seeds oblong, with ciliated margins, and ends with tufts of brown hairs.

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Common cultivated species, of road sides of cities and metropolitan cities. In October small, green fragrant flowers (Flower bloom) appear. All parts of the tree can be considered poisonous. It causes allergenic problems and asthma.

Fls. and Frs: Usually from October to March.

2. *Ipomoea carnea* subsp. *fistulosa* (Mart. ex Choisy) D. F. Austin.

Family: Convolvulaceae

Common name: Besharam, Nagar pan.

An erect, stout, perennial shrub, straggling habits, lower portion fistular, glabrous, with latex, leaves petiolate, cordate, glabrous. Flowers in dichasial cymes, pedicellate, pentamerous, calyx persistent, corolla funnel shaped, pinkish - white, large, stamens 5, anthers filament unequal, anthers sagittate. Stigma dumb bell - shaped, presence of an annular nectar secreting disc below the ovary, capsules ovoid and hairy.

It is found in aquatic and semiaquatic habitats, particularly in ditches along the roads.

Fls. and Frs: Almost throughout the year.

Ipomoea carnea subsp. *fistulosa* (Mart. ex Choisy) D. F. Austin. is an invasive most common notorious semiaquatic weeds species.

3. *Lantana camara* L.

Family: Verbenaceae

Common name: Badbina

A large perennial prickly shrub, erect, spreading branches, lower portion woody, quadrangular, solid and hairy, with recurved prickles, leaves petiolate, ovate, crenate, serrate, rough, coriaceous and hairy. Flowers in umbellate cymes, sub - sessile, multi - coloured, fragrant, corolla bi - lipped, fruit drupe globose and shining.

Most common weeds, occurs in all localities particularly in wastelands, road sides and along nallahs.

Fls. and Frs: Almost throughout the year.

A very abundant exoticnotorious weed of moist wastelands. *Lantana camara* L. possess allelopathic and adverse effect on natural vegetation.

4. *Lantana veronicifolia* Hayek (Syn. *Lantana wightiana* Wall. ex Gamble)

Family: Verbenaceae

Common name: Safed badbina

A large perennial unarmed shrub, erect, spreading branches, lower portion woody, quadrangular, solid and hairy, prickles absent; leaves petiolate, elliptic, ovate, crenate, serrate, rough, coriaceous and hairy. Flowers sub - sessile, bi - lipped, fragrant, white, fruit drupe globose and shining.

Commonnotorious weeds, occurs in all localities particularly in wastelands, forests, road sides and hills.

Fls. and Frs: Almost throughout the year

Lantana veronicifolia Hayek is invasive weed, it also possesses allelopathic and adverse effect on natural vegetation.

5. *Parthenium hysterophorus* L.

Family: Asteraceae

Common name: Gajar ghas

Morphological description: An erect, branched weed, aromatic, fast maturing and spreading, stems green - whitish, hairy; early leaves lower pinnatisect, spread on the grounds, mature plant leaves linear, carrot like. Flower heads small spherical white heterogamous, achenes flat.

Most common exotic weeds found in wastelands, along nallas and road sides.

Fls. and Frs: July to November.

It causes allergenic problems.

6. *Pontederia crassipes* Mart. (Syn. *Eichhornia crassipes* (Mart.) Solms.)

Family: Pontederiaceae

Common name: Jal kumbhi

A stolon, spongy, floating aquatic herb, adventitious roots arise densely at the nodes, leaves large, radical, ovate, spathulate or paddle shaped, petioles spongy and swollen, like globular green bladder. Flowers in spikes, sessile, attractive, violet - blue, fruits capsule ovoid.

Most common fresh water habitats noxious floating aquatic weeds, forming pure formations at many places like lakes, ponds, rivers etc.

Fls. and Frs: August to November.

Pontederia crassipes Mart. reproduce vegetatively very fast, so it spread rapidly. Its removal is a very difficult task. *Pontederia crassipes* Mart. introduced as an ornamental aquatic plant, has become a serious weed clogging waterways and even impedes navigation and fishing in many areas.

7. *Prosopis juliflora* (Sw.) DC.

Family: Mimosaceae

Common name: Bulia, AngrejiBabool.

Morphological description: An erect, thorny shrub or small tree, height up to 12 metres, thick rough grey - green bark, often multi - stemmed, zigzag shaped. Leavesbipinnate, mostly two, sometimes more pairs of pinnae, many pairs of oblong leaflets per pinnae. Inflorescence cylindrical dense spikes in clusters, green - golden yellow, fragrant. Fruits pods pendent long, slightly irregularly curved, pods green which turns yellow upon ripening, contains several hard oval or elliptic seeds.

Most common exotic notorious weeds, occurs in all localities.

Fls. and Frs: August to May.

Prosopis juliflora (Sw.) DC. is an aggressive invasive weed. Plant reproduces through the seeds which are viable for up to several years. It has deep root system, and it replaces completely the native vegetations. *Prosopis juliflora* (Sw.) DC. completely affecting the pasturelands, croplands and water sources areas.

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4. Conclusion

According to Champion and Seth's classification of forests of India the vegetation of Rajasthan falls in two categories tropical dry deciduous forests and tropical thorn forests. Due to increasing number of exotic species many important angiosperm taxa are decreasing rapidly. The abundance of invasive plant species is degrading some keystone habitat of fern localities of Rajasthan. They affect richness of natural flora and fauna, animal assemblages, decreased bird diversity and cause huge economic losses by invading pastoral or aquatic lands. Invasive exotic species causes negative impact on natural life form, phenology and ecological niche of various plant species.

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