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IMPACT OF *Lantana camara* IN THE INDIAN SOCIETY

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Abstract

Lantana camara, an introduced species by the British has turned itself in to a noxious weed, which has expanded itself in almost all the possible habitats of India. It is a major threat to the ecosystem, including plants and animals. Attempt to combat the further spread of this nuisance species has been of little help. Therefore, in the present discussion an attempt on its impact, toxicity, uses and therapeutic properties have been discussed. A carefully knitted plan should be framed emphasizing on exploiting this species economically as well as on taming the present threat so that the Indian society can be benefitted by properly utilizing the plant and thereby also conserve the ecosystem with its bio resources. The present review paper focuses on the various benefitting sides of the *Lantana* that would create better livelihood opportunities.

Key Words: *Lantana camara*, India, weed, ethnomedicines, soil management, allelopathy, livelihood opportunities

Introduction

India is the seventh largest country in the world occupying approximately an area of 32,67,500 Sq Kms. The country is blessed with a rich biological diversity and ranks 6th amongst the 12 mega biodiversity nations of the world owing to its high endemic elements (MoEF, 2009). It is also one of the primary centers of origin of cultivated plants and domesticated animals.

Based on the distribution of different floristic elements, the partitioned India has been divided into 10 botanical provinces (Puri, 1960). India houses approximately 18% of endemic flora which includes 4,900 species of flowering plants that are found nowhere else in the world. They are distributed under 141 genera and 47 families in angiosperms (Chitale et al., 2014). Based on the higher number of endemic elements, which are threatened with the dire of extinction India is blessed with two hot spots (Chitale et al., 2014):

- Indo- Burma (earlier The Eastern Himalayas) and
- The Western Ghats & Sri Lanka.

Endemic floral taxa have failed to establish themselves beyond the area of their existence, primarily due to the failure to disseminate their seeds, fruits, spores and other propagules because of the geographical barriers (including; mountains, oceans, deserts, etc.). Human beings never ending dependence on plant and its products has resulted in the dwindling of the forest-cover. Moreover, overexploitation of floral resource due to humans very basic needs of the 3 Fs i.e., food, fibre and fire-wood have resulted in replacing the wild species with the cultivated ones. This has resulted in the even more sorrow state of the endemic flora of the country.

A major competition to the "*Native flora*" of any geographical region is imposed by the human made introduction of "*Introduced species*". India has acted as a home ground to a large number of introduced species, namely *Acanthospermum hispidum*, *Ageratum conyzoide*, *Cassia tora*, *Cuscuta reflexa*, *Datura metel*, *Parthenium hysterophorus*, *Lantana camara*, etc (Reddy, 2008).In due course of time some of them have been tremendously successful in partial to complete elimination of the native species, thereby affecting their distribution and abundance.

Lantana camara L. (Verbenaceae family) also known as wild sage, a native of South American tropical forest was introduced to India early in the 19th century. In 1807, the species of *Lantana* was introduced as an ornamental plant at the Acharya Jagadish Chandra Bose Botanical Garden of Kolkata (erstwhile, Royal Botanical Garden, Calcutta) (Thakur et al., 1992). However, it soon escaped into the wild and has thereafter successfully propagated throughout the length and breadth of the Indian subcontinent. At present, *Lantana* is treated as "Category-I" invasive exotic species (GISD, 2010; Priyanka and Joshi, 2013).

The success of *Lantana camara* distribution throughout the Indian subcontinent is a reflection of its wide ecological tolerances. It extends right from the subtropical montane forests of Outer Himalayas to the southernmost part of the country including the Andaman and the Nicobar Islands. Habitat range of the species is wide and diverse including the

wastelands, rainforest edges, beachfronts, forests disturbed by natural and anthropogenic activities as well as roadside, railway tracks, canal banks (Roy et al., 2002; Dogra et al., 2009).

The successful invasion to millions of hectares of grazing land; including agricultural fields, pastures by this species can be attributed to the attractive colourful inflorescence it produces. It provides nectar to its pollinator like butterfly, bees, and thrips. Another strategy that makes it to spread to new and untouched lands is the large number of berry and the seeds it produces. The fruits are blue-black in colour when mature and are dispersed by the frugivorous birds, fox and rodents.

From the foregoing discussion it becomes evident that *Lantana camara* is a noxious weed. However, this species is not a complete nuisance. It is used in the preparation of a large number of ethnomedicines. Leaves of *Lantana* provides alkaloid fraction that is highly effective in lowering blood pressure, accelerating deep respiration and stimulating intestinal movements (Singh et al., 1996; Noble et al., 1998; Nagao et al., 2002). Leaf extract is also used in the cure for boils, swellings and pain in the body (Noble et al., 1998). It is also used by village folks in the cure of cancers, chicken pox, measles, asthma, ulcers, swellings, eczema, tumours, high blood pressure, bilious fevers, catarrhal infections, tetanus, rheumatism and malaria (Chavan and Nikam 1982; Sharma and Sharma, 1989; Day *et. al.*, 2003; Begum et al., 2003; Sharma, 2007).

Importance of *Lantana*

It is also useful in the improvement of socio-economic status of the backward communities; stem of this weed if treated with sulphate can be also utilized in preparing paper pulp which is used for wrapping, writing and printing paper and manufacturing baskets (Ray and Puri, 2006; Kannan et al., 2008; Nithani and Pandey, 2009). Stem is also used in the making of temporary shelters as well as bio fuels for cooking and heating purposes (Prasad et al., 2007, Sharma, 1988).

Lantana sp. is also useful in the natural soil management; it prevents soil compaction and erosion. It is also an excellent source of organic matter for pasture renovation. The species shows comparatively lesser capacity of absorbing rainwater than lands under good grass cover. This in turn increases the amount of run-off and the exposing the soil to erosion in areas infested with the weed (Bhushan and Sharma, 2002).

This notorious weed is capable of disrupting life cycle and thereby displacing the indigenous native flora of any region, which leads to a decline in floral diversity. *Lantana* invasion has been found to bear direct consequence with the diversity and community structure of bird assemblage (Aravind et al., 2007). It is also responsible for decline in species richness by the allelopathic interaction. Once established *Lantana*, is very quick to form dense and impenetrable thickets by its gregarious growth pattern. The dense thickets of the species houses malarial mosquitoes in bushes resulting in health problems in the society. Handling *Lantana* causes skin irritation or allergic reaction; it also brings about the mustering of cattle

causing death of stock by poisoning if seeds are accidentally consumed (Yadava and Verma, 1978; Sharma, 1994; Swarbrick et al., 1998, Swarbrick et al., 1995)

Therefore, *Lantana* species bears the potential to contaminate the gene pool of indigenous as well as rare plant species(s) (D'Antonio and Meyerson 2002). It imposes threat to the native colonizers for light, moisture, sunlight and soil nutrients. Till date, various strategies including, biological, mechanical, chemical as well as fire control steps have been employed to curtail the further infestation of *Lantana camara* in India (Babu et al., 2009; Rao et al., 1971; Sankaran et al., 1971; Sen-Sharma and Mishra, 1986; Thakur et al., 1992; Sharma et al., 2005; Priyanka and Joshi, 2013). However, none of the above said methods have achieved success in the root level eradication of the species. *Lantana* has proved itself not only to be a good colonizer but also equally good persisters.

Control of *Lantana*

Therefore, an effective way of controlling the species lies in the planned way of generating livelihood opportunities of the rural people through proper utilization of the species. Stem of *Lantana* bushes can be used for making furniture which is cheaper than cane. Various tribal artisans of South India are ingeniously utilizing *Lantana camara*, for the manufacture of furniture, toys and articles of household utility (Kannan et al., 2008; Perrings et al., 2010). This weed is mixed with mud to make the walls of houses in rural areas of Uttarakhand. Leaves of *Lantana* is rich in various active constituents that exhibits excellent antimicrobial, fungicidal, insecticidal, nematicidal, biocidal activity, therefore it is very useful in the preparation of various folklore and ethno medicine (Sharma et al. 1988; Sharma and Sharma 1989; Ghisalberti 2000; Sharma et al. 1999; Begum et al. 2000; Saxena 2000; Sharma et al. 2007). Twigs and stems of are used as fuel for cooking and heating in various parts of India, it is also useful in the production of commercially valuable ethanol (Sharma et al. 1988; Inada et al. 1997; Varshney et al., 2006).

Recommendation

Overall, discussion of the present state of *Lantana camara* suggests that there is an urgent need to control this weed to save the native biodiversity of India. If proper legal strategies are not employed at this stage, then this nuisance species can go up to the extent of eradicating various endangered as well as endemic species. Therefore it would be wise to develop sustainable management of the rural area through proper channelizing the pros of *Lantana camara* in various rural sectors such as the preparations of herbal ethno medicine, bio fuels, handicrafts and the others.

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