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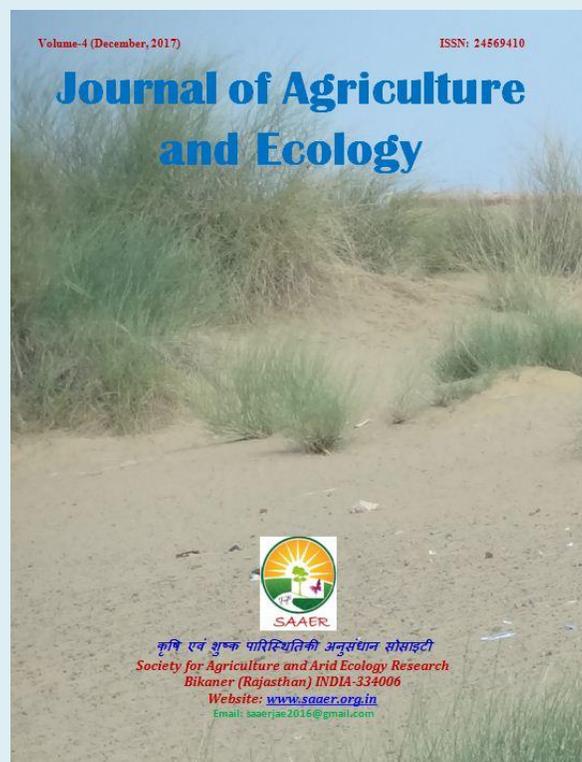
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Khejri tree mortality associated with infestation of *Acanthophorus serraticornis* (Olivier) and *Ganoderma lucidum* (Curtis) p. Karst. in Rajasthan

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Abstract

Two major biotic factors *Acanthophorus serraticornis* (root borer) and *Ganoderma lucidum* (root rot) responsible for khejri mortality was assessed in five districts in Rajasthan. Data obtained clearly revealed that all the dried/ dead Khejri trees under study were invariably infested with either root borer or root rot diseases.

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Introduction

Prosopis Linn. commonly called as mesquite, belongs to family Leguminosae, and subfamily Mimosoideae (Khatri et al. 2010). *Prosopis cineraria* (khejri) is the king tree of Indian arid region, revered for its range of products and services rendered to desert inhabitants and therefore also called as the life-line of desert dwellers. It is a very useful tree, possessing great vitality and rapid growth in its natural zone and considerable power of reproduction from coppice shoots (Gupta & Prakash 1975). It bears religious legends, besides being a tree of socio-economic importance. It provides food (fresh and dried pods), Fodder (fresh and dry leaves), fuel (wood) and fencing material (lopped branches), enriches the soil and also serves as

a shelter for the animals during hot summers. The medicinal value of khejri tree has been mentioned in ancient Ayurveda literature (Kaul 1967). Khejri is a most preferred traditional agroforestry species for centuries. Shankar et al. (1976) has shown higher biomass and soil moisture status under the canopy of the khejri. Its natural regeneration is mainly by seeds and also come up from the root suckers. As such, khejri is not in practice of planting by the farmers but farmers do provide protection to the new saplings which comes naturally.

Western districts of Rajasthan has been encountering khejri mortality problem from more than 10 years. Frequent surveys made in the past (year 2010) in Jodhpur, Nagaur, Sikar, Churu, and Jhunjhunu by Arid Forest Research Institute, Jodhpur, revealed that the

percentage mortality of khejri tree ranged from 18.08 to 22.67 % with an average mortality of 20.93 % in the these districts (Ahmed et al. 2010; Haldhar 2012).

The reasons of mortality of khejri were possibly due to the combined influence of abiotic as well as biotic factors (Singh et al. 2013). Abiotic factors like over exploitation of ground water by way of tube wells, low rain fall over the years, consequent low ground water charging and change in agricultural practices over the years by increased use of tractors and mechanized cultivating, resulting in harms to standing trees roots and seedlings are contributing reasons of khejri mortality (Ahmed et al. 2004). Singh et al. (2013) revealed that the main biotic factors responsible for khejri mortality in Rajasthan were root borer, *A. serraticornis* and root rot disease caused by *G. lucidum*.

Material and Methods

To assess the infestation of these two major biotic factors responsible for khejri mortality in five districts of Rajasthan viz; Jodhpur, Nagaur, Sikar, Churu and Jhunjhunu has been selected and data has been recorded on the infestation of root borer *A. serraticornis* and root rot disease, *G. lucidum* on khejri. A total number of dead trees (5 trees/ locality) were examined randomly in the farmer's fields in all the five districts. Dead trees at each location were uprooted and examined for root borer and root rot disease.

Results and Discussion

Data obtained clearly indicated that all the infested khejri trees were found invariably

infested with either root borer or root rot diseases (Table 1). Hence, from the data it has been established that the biotic stress is one of the major cause for the khejri mortality which is used to be lead by insect-pest *A. serraticornis* and root rot disease *G. lucidum* (Fig.1 &2).



Figure 1. *Acanthophorous serraticornis* larvae in the roots of khejri tree



Figure 2. Fruiting body of *Ganoderma lucidum* in khejri tree

Associations of root disease and insects with tree mortality in many forest ecosystems are very intimate. More than 99%

of conifer trees examined in the San Isabel, Rio Grande, San Juan and Grand Mesa national forests in Colorado had root diseases and more than 80% were infested with bark beetles or wood borers (James & Goheen 1981). Cobb et al. (1974) reported that Ponderosa pine (California) infected with

Ceratocystis wagneri was prone to infestation by bark beetles and buprestid wood borers. Hertert et al. (1975) and Miller & Partridge (1974) reported that almost all the grand fir surveyed in Idaho that was infested with bark beetles also had root disease.

Table 1. Root borer, *Acanthophorus serraticornis* and root rot disease, *Ganoderma lucidum* infestation on *Prosopis cineraria* (khejri)

S. No.	District	Locality	No. of dried/dead trees examined	of Root borer infestation	Root rot infection
1	Nagaur	Rampuriya	5	3 (60%)	5 (100%)
		Ghugriyali	5	4 (80%)	4 (80%)
2	Sikar	Narsara	5	2 (40%)	4 (80%)
		Ramsara	5	4 (80%)	5 (100%)
3	Churu	Khasoli	5	3 (60%)	3 (60%)
		Sultana	5	5 (100%)	5 (100%)
4	Jhunjhunu	Khadot	5	2 (40%)	4 (80%)
		Surani	5	3 (60%)	4 (80%)

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