

ALLELOPATHATHIC IMPACT OF *ADHATODA VASICA*

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ABSTRACT

The Sariska Tiger project covers an area of about 881 km² is situated 180 km from Delhi and about 120 km from Jaipur. The remarkable characteristics of the hills are there homogenetic regularity of height, level submmits and uniform appearance, stretching out from North – East to South – West in more or less parallel lines Soni (2000). *Adhatoda vasica* has invaded the core area of the Sariska Reserve Forest and grows luxuriantly, threatening the survival of herbaceous species. It is, therefore, imperative to study the ecology of *Adhatoda vasica* in the forest which may be valuable for the control of this plant.

Keywords: Sariska Tiger Project, herbaceous, Ecology, Forest.

Introduction

In India *Adhatoda vasica* Nees. a native of India (Kocchar,1981) is one of the most common shrubs growing all over the area along road sides and in the wastelands. It is a dominant evergreen shrub of all seasons. Preliminary field observations and interaction with the forest officials, indicate that it has become a serious problem in the core area of the Sariska Tiger Project, where it grows almost in pure stands at the Kali Ghati hati forest posing a serious threat to the herbaceous vegetation. Hence, the present study was carried out to evaluate seed characteristics and growth behaviour of *Adhatoda vasica* in the Sariska Tiger project.

Materials and Methods

The growth behaviour of *Adhatoda vasica* was evaluated by laying 10 quadrates of 1 m² each at site 1 site 2 and site 3 at Kali ghati forest area of Sariska Tiger project. One east facing and second West facing sites were selected in the Kali Ghati Forest. The density of this plant was estimated for each site situation. 10 plants of *Adhatoda vasica* were uprooted along with roots from each side in September. The vegetative and reproductive characters were estimated. Then, the roots, shoot and reproductive parts of each plant were separated and dried in a hot air oven at 80°C for 48 hours to obtain the dry biomass following Misra (1968).

The biology of *Adhatoda vasica* was studied in the Kali Ghati Forest area of Sariska Tiger Project. Mature fruits of this plant were collected in April and seeds were taken out and stored in paper bags at room temperature in the laboratory. These seeds were used to determine various seed characteristics. Seed germination was studied by soaking the seeds in distilled water for 24 hours and then putting these on Whatman No. 1 filter paper overlain by a thin cotton layer in petri dishes. The filter papers were moistened with distilled water and placed in a seed germinator at 32°C.

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Results and Discussion

• Seed Characteristics

Adhatoda vasica exhibits seed dimorphism as seed size and shape was slightly variable among the seeds obtained from different plants. On the basis of size, seed of this plant were grouped into two categories (1) smallest seeds (5.0 x 5.0 mm) were rough, sub orbital, brown coloured and within 0.07 g weight, (2) the other size of seeds (6.4 mm x 6.12 mm) were smooth oval flat with a beak, dark brown, with 0.10 gram weight. Despite small variation in the seeds obtained from the different plants all type of seeds exhibited seed coat dormancy and 90% viability and germination at room temperature in rainy season after scarification treatment.

• Phenology

Seed germination commenced in the month of June with the arrival of Pre monsoon rains. The vegetative growth continued through out year. Flowering initiation begun at the end of March and attained peak in April. It is a evergreen plant throughout the year. The capsule remained attached to the dried plants. The seeds are dispersed by explosive mechanism of the capsules.

• Population Density

The average population density of this plant was 40 plants m⁻² at site first and 35 plants m⁻² at site second and 30 plants m⁻² at third site of Kali Ghati Forest area of Sariska Tiger Reserve. The low density was observed at natni ka bara. It is due to very disturbed and wasteland area of the forest.

• Vegetative Characters

The average height of this plant was 240 cm in the Kali Ghati valley whereas it was 180, 150 and 90 cm at other sites of Sariska Tiger Reserve. Similar trend was observed with respect to basal area per plant and leaf area per plant in Sariska Tiger project.

• Seed Production

Adhatoda vasica produced 212 seeds for plant in the Kali Ghati valley where is 168, 160 and 80 seeds per plant at the other sites of Kali Ghati Forest respectively. Similar trend was observed with respect to the number of capsule per plant.

• Biomass Production

Biomass production per plant was 175 gram in the valley where as 168, 150 and 100 g at the other sites of Sariska Tiger Reserve. Shoot biomass and root biomass also exhibited similar trend. The root biomass production was highest in the valley of Kali Ghati forest area and lowest at the natni ka bara. The biomass production per plant suggest that the growth rate of *Adhatoda vasica* was maximum in Kali Ghati Valley where is it became minimum at disturbed area of the forest.

References

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