

Faunal Diversity and Associated Predators and Parasites of Wood Boring Coleoptera of Rajasthan Desert

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Abstract: Faunal diversity of three families of coleopterous wood borers inhabiting tree species was assessed. Its composition was 33.3% in Cerambycidae, 25.9% in Bostrychidae and 40.8% in Buprestidae. Borers maintained host selectivity with maximum preference for *Acacia tortilis*. Six species of predators belonging to four families (Trogositidae, Cleridae, Colydiidae and Histeridae) and 7 parasitic species of Hymenoptera were also recorded on wood bores.

Key words: Faunal diversity, abundance, predator, parasite, wood borer, larval tunnel.

Coleopterous wood borers and their natural enemies have not been described in detail. Only few species are listed in the literature. *Julodis* sp. (Buprestidae) was listed by Pruthi and Bhatia (1952), while Parihar (1993) mentioned prevalence of 6 species of wood borers in *Prosopis cineraria* trees. The borer fauna of temperate and tropical zones of India has been investigated by several workers (Beeson, 1941; Khan and Matti, 1983; Singh and Bhandari, 1986; Thakur, 1988). The desert region was surveyed to analyze the faunal diversity of wood borers and their associated predators and parasites on the desert trees.

Materials and Methods

Systematic surveys were conducted in Rajasthan desert during 1990-92. The trees of ecologically different habitats were selected for the study. Random samples of infested woods were taken out with the help of an axe or hunter's knife, packed tightly in polythene bags and brought to

laboratory for further observations. The samples were reared individually, and the adults emerging from the infested materials were identified and got authenticated from International Entomological Institute, London, Lenin Zoological (Entomological) Museum, Leningrad, and Zoological Survey of India, Calcutta.

Results and Discussion

Faunal diversity and wood borers

A total of 27 species of coleopterous wood borers were collected (Table 1). Family wise species composition of the borers are discussed below.

Cerambycidae: Over 1200 species of cerambycidae are reported from India (Beeson, 1941). However, we could record only 9 species from Rajasthan desert. Around 33.3% of all the borers belonged to this family. They were capable of damaging practically every part of the tree except foliage.

Table 3. Coleopterous predators of woodborers

Predator		Host		Locality
Family	Species	Family	Species	
Trogositidae	<i>Melania cardoni</i> Lev.	Bostrychidae	<i>Sinoxylon indicum</i>	Jodhpur
Cleridae	<i>Tillodenops bimaculatus</i> Schrl.	Bostrychidae	<i>Sinoxylon anale</i>	Sambhar
	<i>Tillus notatus</i> Klug.	Bostrychidae	<i>Sinoxylon</i> sp.	Nawa
Colydidae	<i>Pseudobothrideres neglectus</i> Grov.	Buprestidae	<i>Chrysobothris parvipunctata</i>	Fatehpur
	<i>Teretrium mogul</i> Lewis.	Bostrychidae	<i>Sinoxylon anale</i>	Jodhpur
Histeridae	<i>Teretriosoma stebbingii</i> Lewis.	Bostrychidae	<i>Sinoxylon indicum</i>	Nawa

Borer's preference to host trees

Borers manifested certain extent of selectivity to host tree species for breeding and shelter. Of all the species assessed, *Acacia tortilis* was the most preferred (Table 1). It harbored 9 species of borers (4 bostrychids, 4 buprestids and one cerambycid) to breed there. *Acacia senegal* and *P. cineraria* gave shelter to 5 species (1 cerambycid, 1 bostrychid and 3 buprestids). Three species of bostrychidae preferred *Acacia albida* and 2 species liked *Acacia nilotica*. The least preferred trees/shrubs were *Calotropis procera*, *Prosopis juliflora*, *Tecomella undulata*, *Ficus religiosa* and *Holoptelia integrifolia*.

Prevalence and abundance of species

Borers were present in the trees at all the experimental sites in both arid and semi-arid zones (Table 1). The abundance of these species was more in the arid areas (12.5 species) as compared to semi-arid areas (6.2 species). Out of 8 locations, higher abundance was noticed at Jodhpur (22 out of 27 species) and the least (3 species) at Jhunjhunu. It is interesting to note that

comparatively more arid conditions (rainfall, 300 mm) did not affect the dominance of borers as compared to semi-arid location of Jhunjhunu (rainfall, 600 mm).

Predators of borers: Six species of entomophagous predators, associated with the larval tunnels and wood borers, were identified to predate on the host insects. These are new records from this region and are described family wise.

Trogositidae: Only *Melania cardoni* Lev was identified in this family. Adult of this species is black, flattened and measured about 12-17 mm in length. It was predaceous on larva of bostrychid (*Sinoxylon indicum*). The larva is about 25 mm in length and has nearly cylindrical body segments, depressed anteriorly and has a pair of hooked processes on 9th tergite. Only one generation was noticed with adults emerging in June-July. Beeson (1941) has listed it as predaceous on insects of Bostrychidae and Cerambycidae families.

Cleridae: Two species, *Tillus notatus* klug and *Tillodenops bimaculatus* schrl., were recorded in this family. Adult *T. notatus* is red with black marking on elytra. It was predaceous on both larval and adult

Sinoxylon sp. found in *A. tortilis* plantations. The larva was seen feeding on the egg, larva and pupa of the borer in its cavity, and the adult feeding on the adult borer. Some species were noticed to feed on other coleopterous predators and hymenopterous parasites (Beeson, 1941). Females laid eggs in the tunnels of host and the larvae explored the tunnels of the boring larvae. Pupation took place in the pupal cell in the wood. *T. bimaculatus* was found in the larval tunnel of *Sinoxylon* sp. in *A. tortilis*. The larva is hairy, elongate, flattened with sclerotised pronotum. This species has been reported from North Africa and India (Beeson, 1941).

Colydiidae: *Pseudobothrioides neglectus* Grouv was recorded from under the bark and in the tunnel of *Chrysobothris parvipunctata* (Buprestidae) in *A. senegal*. Adults are oval and convex; larva pupates in the host tunnel in a cocoon of a chitinous material. The adult emerges in June-July.

Histeridae: Two predators were noticed in this family. In *Teretrius mogul* Lewis adults are black, oval, convex and more cylindrical. Female laid eggs in the tunnel of *Sinoxylong anale* (Bostrychidae) in trees of *A. senegal* and *Albizia lebbek*. Larva is slender, cylindrical and white. Adults emerged in May-August. *Teretriosoma stebbingii* Lewis was noticed in the larval tunnel of *S. indicum* (Bostrychidae) in *A. tortilis* and *A. albida*. Adults emerged in June-July. This predator has also been reported in the larval tunnel of *Acmaeodera* sp. (Beeson, 1941).

Hymenopterous parasites: Six species of parasites associated with wood borers in their larval tunnels were identified. Their family wise details are:

Braconidae: The parasites are *Bracon* sp., *Chaoilta* sp. and *Hacabolodes radialis*. A single female of *Bracon* sp. laid about 57 eggs on the host larvae of *Acmaeodera* sp. and the larvae of parasite fed externally on the body wall of the host larva.

Pteromalidae: *Oodera* sp. and *Norbanus* sp. were recorded under this family. Adult of *Norbanus* feeds on the body fluid of the larvae of *Derolus* sp. (*Cerambycidae*) and *Oodera* species feeds on *A. drawids* (Buprestidae) (Beeson, 1941).

Stephanidae: *Neostephanus* sp. was noticed in this family. Female of this species deposits eggs into the body wall of larva of *Acmaeodera* sp. (Buprestidae), with the help of its long ovipositor. Beeson (1941) had listed this genus as parasitic on the larvae of coleopterous insects.

The prevalence of 27 species of coleopterous wood borers, and simultaneous breeding of 12 species of predators and parasites in the larval tunnels of borer species exhibits great faunal complexity. It needs further investigation to understand interaction between the hosts and natural enemies that have established in the tree ecosystem under arid and semi-arid regions.

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