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RESEARCH PAPER

Role of moisture content in rendering the sal tree component susceptible to the borer (*Hoplocerambyx spinicornis)* attack

SUNITA NEGI AND V.D. JOSHI

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See end of the article for authors' affiliations

Correspondence to :

V.D. JOSHI
Department of Zoology, Govt., P.G. College, KOTDWARA (UTTARAKHAND) INDIA

ABSTRACT

Moisture stress plays an important role in rendering tree susceptible to borer attack by rendering bark moisture content and allowing larvae to penetrate to the cambium. Thus in the present study moisture content was analyzed of different tree component like the bark, sapwood and the heartwood in different categories of attacked trees ranging from mild to severe in intensity as high levels of bark moisture content prohibit beetle colonization. Moisture deficiency makes the tree more susceptible to the insect attack, enables them to support high herbivore densities and contributes to insect outbreaks.

Key words : Moisture, Sal tree components, *Hoplocerambyx spinicornis*, *Shorea robusta*.

Hoplocerambyx spinicornis is a major pest of Sal (*Shorea robusta*) which causes extensive damage to the Sal trees. In recent years, large scale mortality of Sal has been observed in different states of India. Therefore, it becomes worthwhile to carryout the investigation on the factors responsible for such outbreaks. In fact the borer attacks the mature and over mature trees with low vitality at the first instance and when the population gets built up, the trees of lower girth are also attacked. Insect outbreaks occur when drought or aging reduces the ability of the tree to resist beetle attack through its oleoresin system (Rudinsky, 1962; Hanks, 1993). Hsiao (1985) reported that the orientation of phytophagous insect to their host involves perception of a variety of stimuli.

Moisture stress plays an important role in tree susceptibility to borer attack due to less bark moisture content, which allows the larva to penetrate sapwood through cambium. Chararas (1969) and Hanks (1991) concluded that resistance of eucalyptus is associated with the moisture content of the bark and drought stress may favour colonization of the beetles of *Phoracantha semipunctata* by reducing bark moisture. Moisture content was analyzed in different categories of bark, sapwood and heartwood.

MATERIALS AND METHODS

Samples of bark, sapwood and heartwood of different girth classes (50cm-200 cm) were brought to the laboratory during the month of April-June (1999-2003). Samples were also taken from Sal tree having different categories of attack ranging from (I-VIII,) *i.e.* I-Category when the crown is dead, leafless, epicormics leafless, wood dust in large heap; II-Crown dead brown; epicormics dead, brown; wood dust in large heap; III-Crown dead,brown; epicormics or bark dead in upper part, alive in lower part of the trunk, wood dust in heap or more than 6cm deep or less abundant; IV-Crown partly alive, green;epicormic green, wood dust in large heap on attacked site; V-Crown entirely alive green, epicormics green, wood dust in large heap;VI-Stump with large heap of dust; VII-Crown entirely alive, green, epicormics green, resin abundant or absent, wood dust scattered or scanty; VIII-Healthy growing Sal tree.

The samples (250 g) collected from the field were kept inside the oven at 105°C and moisture content for each category of bark, sapwood and heartwood was calculated as follows: (Wilde, 1985). Moisture content was determined following

$$\text{Moisture\%} = \frac{\text{Fresh weight - Oven dry weight}}{\text{Ovens dry weight}} \times 100$$

The materials were then chopped for further analysis. The data obtained were then subjected to the Analysis of Variance (ANOVA) and the study sites were used for source of variation for better insight of difference between components of study sites that were significant, critical difference (CD) value has been calculated at 5% probability. This calculation method was based on student t–test.

RESULTS AND DISCUSSION

Moisture content in bark:

The moisture content percentage of bark ranged from 12.39% to 24.34% in different categories of attack