
EFFECT OF SHADE ON LIMONOID AND NITROGEN COMPOSITION IN SHOOTS OF *Swietenia macrophylla*.(KING)

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The main factor limiting cultivation of mahogany, *Swietenia macrophylla* King (Meliaceae), in plantations is damage by shoot borers (*Hypsolyta* spp.). Shade has been repeatedly cited as reducing shoot borer attack but the responsible mechanisms have not been determined by experimentation. Shade may alter either secondary compounds such as limonoids or nitrogen concentrations or both in the plants making them unsuitable for insect survival and development. Previous studies have not examined whether shade influences limonoid and nitrogen content of *S. macrophylla* and thereby alter shoot-borer attack. Therefore, these studies were designed to identify the variation in incidence of shoot borer attack under three levels of shade treatments in the field conditions and the variation in plant chemistry of *S. macrophylla* shoots grown under three different artificial shade treatments. The hypotheses tested were under high light availability (i) incidence of shoot borer attack increases (ii) the concentration of limonoids present in the shoots of *S. macrophylla* decreases and (iii) total nitrogen content of shoots increases.

This study was done from 1997-99 in Sri Lanka and UK. Attack by the shoot borer was assessed 54 weeks after planting. The Limonoid content was investigated by Thin Layer Chromatography (TLC) and the total nitrogen by Kjeldahl method using freeze-dried powdered shoots. The incidence of shoot borer attack was significantly higher under low shade (d.f.=2, F=8.6, p=0.0003). The intensity of the green-blue fluorescence under UV seen in the TLC plates was greater using the extracts from the high shade treatment compared to that from the low shade treatment. The total nitrogen content was statistically lower in the high shade ($1.114 \pm 0.22\%$, n=33) compared to that in full light ($1.36 \pm 0.22\%$; n=31). These results suggest that light environment may have a significant effect on the concentrations of limonoids and nitrogen in *S. macrophylla* which in turn influences the shoot borer attack.

The study forms part of a larger project on 'Silvicultural prescription for mahogany plantation establishment'; Research grant funded by DFID, UK is gratefully acknowledged.