

D231

Biological and physiological aspects of host associations and provenance variation of *Santalum album* L. in Sri Lanka

Santalum album L. is an obligate woody root hemiparasite that produces a highly valued aromatic heartwood and an oil (Santalol). Due to high economic value, the Sandalwood cultivation is becoming more popular in Sri Lanka. The complexities involved in silviculture of this hemiparasite, mainly due to the necessity of incorporating another host plants, makes it difficult to grow and cultivate under normal conditions. This study investigated the influence of two pot host species on the growth of *S. album*, composition of mineral nutrients of *S. album* and its hosts and the genetic variability of *S. album*.

Significant growth increments ($P>0.01$) of *S. album* were observed for height (Ht) and root collar diameter (RCD) when parasitizing *Phaseolus mungo* (Ht=12.20±0.11cm, RCD=0.85 ±0.01mm) and *Cosmos sulphureus* (Ht=11.76±0.13cm, RCD=0.80± 0.01mm), compared with *S. album* grown on its own or autotrophically (Ht=10.74 ±0.12cm, RCD=0.73± 0.01mm). Previous studies have shown that *S. album* can grow without parasitizing another plant for a maximum period of one year. Chlorophyll content (Ch) and the stomatal indices (SI) were also significantly different ($P>0.01$) in autotrophic *S. album* (Ch=0.57mg/g tissue, SI=10%) when compared with *S. album* parasitizing *P. mungo* (Ch=0.63 0.01mg/g tissue, SI 14%) and *C. sulphureus* (Ch=0.62 0.01mg/g tissue, SI=16%).

The elemental analysis studies showed that the elements such as K, Mg and Ca were higher in *S. album* than its hosts (*Tamarindus indicus*, *Pongamia pinnata*, *Caesalpinia pulcherrima*) in natural habitats. Potassium, which is a highly mobile element in the xylem sap showed the highest level of enrichment in *S. album*. However this elemental enrichment in *S. album* was not observed in the pot host experiment. This can be attributed to the few immature haustoria present in the pot bound *S. album* plants, not having the full potential to preferentially abstract elements from host plants. Although the preliminary Polymerase chain Reaction study showed a similar banding pattern for all the provenances examined , an additional distinct band was observed in the Australian variety. The specificity of this band, however needs to be further examined. This variation and the studies on plants collected from a range of provenances will be carried out in the future.