Short Communication

BIOLOGICAL CONTROL OF MISTLETOES BY INSECTS

Members of Loranthaceae are semi-parasitic angiosperms and are popularly known as mistletoes. They cause more economic loss than any other angiospermic parasites. They mostly attack dicotyledors and gymnosperms which include horticultural plants as well as forest trees. Control of mistletoes has been advocated and practised throughout the world. Gill and Hawksworth (1961) suggested (i) physical removal and (ii) chemical control as direct control measures. Silvicultural management system like thinning and use of isolation strips have been stated to be effective in reducing the infestation and spread of dwarf mistletoes (Greenham and Hawksworth 1964; Hawksworth *et al.* 1977). Certain amount of natural control exists in some areas where particular insects and fungi reduce the infestation (Greenham and Hawksworth 1964). Gill and Hawksworth (1961) gave brief notes on insect attack of dwarf mistletoes. Approach towards the biological control of mistletoes by insects has been indicated by Hawksworth (1971) and Smith and Funk (1980). Graves and Graves (1980) noted that the larvae of *Citheronia regalis* (Citheronoiidae : Lepidoptera) feed on the leaves of *Phoradendron flavescens* (Pursh) Nutt. Lefroy (1909) reported *Delias eucharis* (Pieridae : Lepidoptera) as a pest of *Loranthus* and opined that they are easy to rear. Mathur and Singh (1959, 1960) listed insect pests on 11 *Loranthus* spp. and 2 *Viscum* spp. They reported that the larvae of *Pratapa deva deva* and *Cleon cleobis* (Lycaenidae : Lepidoptera) and *Euthalia lubentina* (Nymphalidae : Lepidoptera) are defoliators of *Loranthus scurrula* Linn. (*Scurrula parasitica* Linn.). The larvae of *Delias decombesi* were reported to feed on the species of *Loranthus* (Talbot 1978). Mushtaque and Baloch (1976, 1979) recorded *Eutzopherodes ephestialis* (Pyralidae : Lepidoptera), *Demarchus pubipennis* (Chrysomelidae : Coleoptera) and *Anarsia segmatica* (Gelechiidae : Lepidoptera) and *Ceratitella asiatica* (Trypetidae : Diptera) as insect pests of *L. longiflorus* Desr. They also recorded 27 species of insects and mites associated with *Loranthus* spp. in Pakistan of which 12 species of insects appeared to be restricted feeders. The phenology, biology and host specificity of *E. ephestialis, D. pubipennis, A. segmatica* and *C. asiatica* were studied and rated as effective biological control agents for the parasite. Baloch and Ghani (1980) reviewed the potential biological control methods, mainly by insects and fungi, for six genera of

important parasitic weeds of Pakistan. Girling *et al.* (1979) reviewed the biological, chemical and cultural control methods of mistletoes including crop tolerance and germination stimulants. The occurrence of scolytid and cerambycid beetles in controlling *Dendrophthoe* spp. was reported and several suggestions were put forward to control mistletoes by Hambali (1977). Ghosh *et al.* (1982) reported that caterpillars of *D. eucharis* eat on the leaves and tender branches of *D. falcata* (Linn. f.) Etting. causing heavy defoliation. Alam (1984) stated that the leaves of *Macrosolen cochinchinensis* (Lour.) Van Teigh. were infested by some insects and became curled. He also noted that the larvae of some insects feeding on the leaves of *S. gracilifolia* (Roxb. ex Schult.) Dans. grow on gamar (*Gmelina arborea* Roxb.). The larvae caused much damage to the mistletoe without causing any damage to the host.

There is no record of systematic studies on the biology and control of mistletoes in Bangladesh. Recently a bush of *S. parasitica* Linn. and *M. cochinchinensis* developed in the mid-crown region of *Lagerstroemia indica* Linn. at Bangladesh Forest Research Institute Campus, Chittagong. The parasitic bushes were kept under observations. During December, 1986 a cluster of caterpillar was noticed to feed gregariously on the leaves of *S. parasitica*. An egg mass was found on a single leaf. Both the egg masses and the cluster of larvae were reared separately in the laboratory. The butterflies that emerged from the collected eggs and larvae were indentified with the help of the key developed by Baksha and Choudhury (1983) as *Delias hyparete* (Pieridae : Lepidoptera) and *D. aglaia* (Pieridae : Lepidoptera) respectively. The caterpillars of both the species eat voraciously on leaves of *S. parasitica* devouring leaf tissues including veins, veinlets and even the midribs which leads to complete defoliation leaving only the bare twigs. This is perhaps the first record of a host plant for *D. hyparete* as Baksha and Choudhury (1983) reported that no specific host plant was known for the pest. No leaf of the host (*L. indica*) and that of *M. cochinchinensis* were seen to be affected. This indicates a definite choice of hosts by the insects.

The larvae of both the species can easily be reared in the laboratory. Thus, it is apparent that these insects may be employed as a potential agent for biological control of *S. parasitica*. No alternate host was recorded for the insects during this investigation. Further studies to verify the biological control of *S. parasitica* are warranted.

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