

## ABSTRACT

**Laboratory studies on the leucaena psyllid, *Heteropsylla cubana* (Crawford) and its parasitoids *Psyllaephagus yaseeni* Noyes and *Tamarixia leucaenae* Boucek.**

Namdeo Patil

Laboratory studies on various aspects of the biology and ecology of the leucaena psyllid and its parasitoids were conducted as part of a wider study to develop a biocontrol programme against this pest.

Development of both the pest and its parasitoids was studied. One to five-day old leaves of *Leucaena leucocephala* were the most preferred stage for oviposition for *H. cubana*. A study on immature biology provided descriptive information on the various instars of pest and parasitoids, *Psyllaephagus yaseeni* and *Tamarixia leucaenae*.

The effects of constant temperature on the life cycles of *H. cubana*, *P. yaseeni* and *T. leucaenae* were examined under laboratory conditions. Survivorship of the two parasitoids tested at four relative humidities and two temperatures, showed that RH of 76% and 44%, were the most favorable for both the species.

Age-specific life table statistics i.e. innate capacity for increase ( $r$ ), generation time and population doubling time were calculated for the psyllid and both the parasitoids. Studies on the biology of *T. leucaenae* revealed that hosts attacked by *T. leucaenae* are paralyzed and moulting is arrested. Body size of adult *Tamarixia* depends on the host larval instar that was parasitised. Sex allocation studies in *P. yaseeni* revealed that both female and male eggs were allocated to the first host instar but, mostly male eggs to the second. Both parasitoid species feed on nymphs of *H. cubana* and weak

density dependence was observed in functional response tests. *P. yaseeni* always caused a higher percentage of parasitism than *T. leucaenae*.

Investigation of host discrimination in the two parasitoids revealed that superparasitism occurs in *P. yaseeni* but the distribution of attacks suggests avoidance. Superparasitism by *T. leucaenae* was very rare. Competition studies between the two parasitoids for hosts displayed a reduction in parasitism when both parasitoids were introduced into host cages; however, if sufficient hosts were provided, multiparasitism levels were very low. It was concluded that competition between these two parasitoid species in the field is unlikely to be important and both species could be introduced to control the leucaena psyllid.