A study in Cuba of the biology, ecology and agroecological management of *Heteropsylla cubana* Crawford in *Leucaena leucocephala* (Lam.) de Wit

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Introduction As a consequence of the increase in *Leucaena leucocephala* areas to counter the shortage of feed in Cuban cattle production, there is a risk of the development of *Heteropsylla cubana* Crawford (Hemiptera: Psyllidae) as a pest in silvopastoral systems with this legume. This psyllid is known to be the main phytophagous pest (Valenciaga, 2003), which produces damage in 95% of the apical region of branches. Since information on the identification and biology of a pest species is a necessary prerequisite for its management, a taxonomic, biological and ecological study was conducted to define *Heteropsylla* behaviour in Cuban conditions and elaborate the theoretical basis to propose management alternatives.

Materials and methods To achieve these objectives, we developed six main aspects of this work : taxonomy, biology, plant-insect relationships, effects of the feeding activity of *H. cubana* in *L. leucocephala*, ecological traits, biotic and climatic factors affecting the damage scale of *H. cubana,* theoretical basis for establishing management alternatives. Laboratory, semi-control and field experiments were carried out.

Results All the psyllids collected in the adult stage corresponded to *H. cubana;* the genitalia of the males and females were similar to those described by Crawford in 1914, whose results are consistent with those of Muddiman *et al.* (1992). The duration in days of the periods of pre-oviposition, oviposition, post-oviposition, ranged from 2 to 3 days and the sexual index was 1:2, i.e. there were 2 females for each male.

Spatial analyses according to the dispersion indices or average variance rate indicated that *H. cubana* tends to aggregation (b>1) independently of the diversification of the agricultural ecosystem. Oscillations of natural movement of the populations of eggs, nymphs and adults of *H. cubana* (figure 1) are similar for each development stage, with an increase in egg numbers/m2, in the first years of exploitation of the system evidence of an annual population peak in the period when temperatures start to decrease (October to December), i.e., end of the rainy season, beginning of the dry season.

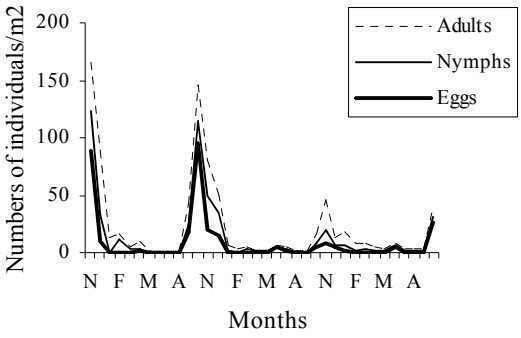

Figure 1 Oscillations in eggs, nymphs and adults of *H. cubana* with time

The results indicate that there is an active permanence of natural enemies in *L. leucocephala* sowings studied in Cuban conditions, whose levels are favored by the increase in plant biodiversity by providing feed to this species in its different growth stages. Therefore, we could state that the performance of the climatic factors determine better the population dynamics of this psyllid, compared to the biotic factors.

Conclusions These results constitute the first studies made in Cuba on the reaffirmation of *H. cubana* as the predominant species in *L. leucocephala* in the different regions sampled in Cuba. The life cycle of *H. cubana*, its space and time was elucidated. The natural enemies associated and performance of the climatic factors explain the regulation of its populations. This enables us to propose an agroecological management of the insect.

References

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