

Developing Mass Rearing Procedures for the Parasitoid *H. coffeicola* Schmeid for Control of the Coffee Berry Borer *Hypothenemus hampei* Ferrari

P. KUCEL¹, S.T. MURPHY², J. OROZCO-HOYOS³ AND R. DAY⁴

¹Coffee Research Institute (CORI), P.O. Box 185, Mukono (Uganda)

²CAB-International (UK) Centre, Silwood Park, Ascot, Berkshire SL5 7TA, UK

³Centro Nacional Investigaciones de Café (CENICAFE), Apdo.Aéro 2427 Manizales, Caldas (Colombia)

⁴CAB-International Africa Regional Centre, P.O. Box 633-00621, Nairobi (Kenya)

SUMMARY

The coffee berry borer (*Hypothenemus hampei* Ferrari) undoubtedly is one of the most damaging pests of coffee worldwide (Moore et al., 1990; Guadalupe-Rojas et al., 1998). Use of pesticides for control of the pest is widely discouraged because of problems of pesticide residues in coffee beans, and effect of the pesticides on natural enemies of the borer and other beneficial insects. Biological control programmes based on use of the parasitoids *Prorop nasuta* (Waterston), *Cephalonomia stephanoderis* (Betrem) and *Phymasticus coffeae* (La Salle) have been successful in many countries including Colombia. However, attempts at use of the Braconid *Heterospilus coffeicola* (Schmeid), considered the most efficient at suppressing borer populations in its native Africa, have been largely unsuccessful owing to its inability to reproduce in captivity.

Studies were conducted in Uganda during 1999-2000 into aspects of the biology and ecology of *H. coffeicola* in order to develop procedures for its mass rearing. The study investigated the effect of temperature, light intensity, space and feeding on sexual behaviour, egg development, oviposition and fecundity. Results show temperature was not a critical factor in egg development but affected incubation period and proportion of the initial eggs developing into the larval, pupal and adult stages of the wasp. Conditions of illumination far stronger or weaker than normal daylight did not favour oviposition. The rate of oviposition in sleeve cages was also found to increase with size of the cages. Mating and feeding led to better and more viable eggs being oviposited.

The findings of the study were incorporated into the strategy for mass rearing of *H. coffeicola* for use in coffee berry borer biological control programmes in Africa and South America.