

ABSTRACT

Following an increase in the level of *Diatraea* attack on sugarcane in Trinidad in 1968/69, control measures were required. A review of the literature on the biology and control of *Diatraea* species in the region indicated that biological control was probably the best strategy to be adopted in Trinidad.

The introduction of parasites into Trinidad was undertaken and *Cotesia (Apanteles) flavipes* (Cam.) (Hymenoptera : Braconidae) a larval parasite, appeared to offer the best chance of establishment and success. Its already proven success (eg. in Barbados) and its short life cycle were also factors in its favour.

Since parasite production depends on the availability of large numbers of suitable hosts, studies were conducted on the rearing of *Diatraea* under laboratory conditions. It was shown that *Diatraea* can be reared either on corn or cane or on artificial diets. *D. lineolata* (Wlk.) *D. impersonatella* (Wlk.) *D. saccharalis* (F.) and *D. centrella* (Mosch.) were all shown to be suitable hosts of *Cotesia*. Another larval parasite, *Lixophaga diatraeae* (Tns.) (Diptera : Tachinidae) was reared on a number of hosts without any reduction of fecundity.

Ecological studies of natural population fluctuations of *Diatraea* confirmed the existence of differences in parasite populations and their importance in natural control of *Diatraea*. The most important natural larval parasite found was *Paratheresia claripalpis* (Wulp.) (Diptera : Tachinidae) which was in turn attacked by two pupal hyperparasites, *Rozanoviella zosterica* (Kerrich) (Hymenoptera:Thysanidae) and *Trichopria cubensis* (Fouts.) (Hymenoptera : Diapriidae).

Population studies revealed a delayed density-dependent relationship of *Paratheresia* on *Diatraea* spp. Analysis of data also revealed two regular cycles in population densities of *Diatraea*, *Paratheresia* and its hyperparasites (*Rozanoviella* and *Trichopria*). These two cycles were separated into a one-year cycle and a four-month cycle and these cycles are discussed in relation to rainfall and density dependence, respectively.

A life table was prepared to show the importance of various mortality factors (including introduced parasites and naturally occurring parasites) on *Diatraea* survival.

From this life table certain criteria were suggested for the introduction of further suitable parasites of *Diatraea*.

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