SOME FACTORS INFLUENCING THE EFFICIENCY OF GONIOZUS MARASMI KURIAN, A PARASITE OF THE MAIZE AND JOWAR LEAF ROLLER

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INTRODUCTION

The damage caused to jowar plants by the maize and jowar leaf roller [Marasmia trapezalis (Guen.)] and the occurrence of its natural enemies in Delhi have been recently reported by the present authors (1961). Goniozus marasmi Kurian* (Hymenoptera: Bethylidae) is a dominant parasite in the biotic complex of Marasmia. This parasite is usually met with in leaf rolls of Marasmia caterpillar in the field. It prefers caterpillars of medium size for oviposition, fully developed hosts being rarely attacked. The parasite was first noticed in jowar fields in the beginning of July, when the pest population was quite low. Towards the end of August, about 45% of the jowar plants in the field were found attacked by the leaf roller; an estimation of parasitism during this period showed that about 40% of the host caterpillars were attacked by G. marasmi. The natural parasitism, thereafter, steadily increased and by October about 60% of the caterpillars were parasitised.

The observations recorded herein mainly concern an analysis of factors which modify the efficiency of G. marasmi as a natural mortality factor in populations of Marasmia. Careful observations were carried out periodically to study the interactions occurring between individual members of the Marasmia complex in nature. Laboratory experiments on parasite behaviour were also done at a temperature of 80°F. and 75% relative Humidity, to correlate laboratory data with field observations. The results of these studies are incorporated in this communication.

BIOLOGY, BIONOMICS AND HABITS

The egg is elongate-ovoid and slightly curved (Plate XIII, Fig. 1). It is transparent and glistening when newly laid and is not easily distinguished

* Identified by Dr. C. Kurian, Central Coconut Research Station, Ochira, Kerala State.
from the cuticular folds of the host. The incubation period lasts for 18–24 hours under laboratory conditions.

As soon as the egg hatches, the parasite grub starts feeding on the host and remains at the same point throughout the feeding period. The grub is arched and more or less takes the shape of the curvature of the host (Plate XIII, Fig. 2). In the very early stage the body segmentation is indistinct (Plate XIII, Fig. 2). Very soon the spiracles and the tracheal system appear. As the larva develops, its body becomes more curved. In a 42-hour old larva, 13 body segments and 10 pairs of spiracles can be clearly seen (Plate XIII, Fig. 4). The mandibles are well developed (Plate XIII, Fig. 3). The cuticle of the grub is very thin and transparent and the internal organs are clearly visible. The larval stage lasts for 48 hours.

When full fed, the grubs leave the host, drop down on the leaf and spin brownish cocoons near the host remains or a little away in the leaf roll. By the time the grubs become full fed, the host is practically dead, showing