GYRON GNIDUS, A SCELIONID EGG-PARASITE OF ACANTHOMIA TOMENTOSICOLLIS [HEM.: COREIDAE] IN NIGERIA

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Gryon gnidus Nixon (Hym.: Scelionidae) is an egg-parasite of the pigeon pea coreid, Acanthomia tomentosicollis Stål in Nigeria. The life-cycle is completed in 8-14 days. The parasite is solitary and levels of parasitism in the field vary between 0% and 69%. The parasite is highly host-specific and eggs of other legume-infesting coreids including Acanthomia horrida Germ., Anoplocnemis curvipes F., Mirperus torridus Westw., and Riptortus dentipes F. are not attacked. High levels of parasitism were recorded and parasite population build-up followed the trend of host population levels but did not prevent the host populations from reaching economic injury levels.

Acanthomia tomentosicollis Stål is the most important pest of Cajanus cajan (L.) Pigeon pea) throughout West Africa. It has also been recorded as one of the 3 species (of Acanthomia associated with pod damage on cowpea (Vigna unguiculata Walp.) in Nigeria (Booker, 1965; Taylor, 1968; Taylor & Omoniyi, 1970). Golding (1948) recorded the nymphs on cowpea in southern Nigeria, and Prevett (1961) reported A. tomentosicollis as the more important of the 2 coreids damaging cowpea in Kano, northern Nigeria. Materu (1970) studied the damage caused by this species and the closely related species, Acanthomia horrida Germ. on C. cajan, Phaseolus spp. and Dolichos lablab (L.) in Arusha, Tanzania. Although A. tomentosicollis is associated with many cultivated plants, mainly members of the Leguminosae, it appears to have achieved a pre-eminent status as a pest on Cajanus cajan and causes from 50% damage to almost total crop loss on this crop in Nigeria. Materu (1970) showed that Acanthomia damage caused reduction in the weight, number and quality of seeds of beans and pigeon pea. He also showed that varying densities of A. tomentosicollis on C. cajan caused damage ranging from 10.5% to 44% at approximately 12 bugs per plant and substantially reduced seed viability.

Observations in Nigeria have shown that shortly after the beginning of pod-setting in C. cajan, there is a build-up of A. tomentosicollis population to very high densities leading to severe damage and shrivelling of the majority of the pods set. This high density does not appear to persist and, at other times of the year, the incidences of both insect and damage are low. In the course of planning control and management methods to reduce A. tomentosicollis damage, a study of the natural enemies revealed the occurrence of a scelionid egg-parasite. Taylor & Omoniyi (1970) reported this parasite, Gryon gnidus Nixon, as heavily parasitising the eggs of A. tomentosicollis in nature. The work reported here was carried out as a preliminary study of the biology and significance of this parasite as a natural enemy to A. tomentosicollis and possibly other coreids associated with cultivated legumes in Nigeria.
MATERIAL AND METHODS

The culture of parasites was established in the laboratory from field collections of parasitised eggs. Individual batches of field-collected eggs were placed in specimen tubes plugged with cotton wool and kept in a climatic cabinet maintained at 30 °C, 80 % R.H. and 12 h light, 12 h darkness until the parasites emerged. The parasites on emergence were fed on a streak of honey made with a needle point on the inner side of the tubes and were maintained in the cabinet until required for experiments.

Soon after emergence, parasites to be used for experiments were sexed, after a 5-minute period of exposure to low temperature (about - 9 °C), by using the antennal differences. Males and females were kept together on freshly laid eggs of A. tomentosicollis in the laboratory and observations on biology and behaviour carried out.

For the host-specificity studies, eggs of A. horrida, Anoplocnemis curvipes F., Mirperus torridus West. and Riptortus dentipes F. were exposed together with eggs of A. tomentosicollis or separately to the parasites in specimen tubes; the parasites remained confined on the eggs until they died.

The level of parasitism in the field was studied by taking weekly samples of 20 egg batches at random from the field and placing them in the climatic cabinet until the nymphs had hatched or the parasites had emerged. Eggs from which neither hatching nor parasite emergence was recorded were dissected to determine whether or not they were parasitised.

OBSERVATIONS

BIOLOGICAL NOTES

Gryon gnidus was found to be the only common egg-parasite of A. tomentosicollis; two other unidentified parasites were found unfrequently. The parasite is solitary and on no occasion were two larvae found developing within a host egg. The adult parasites normally emerge by gnawing a roundish hole in the flattened part of the host egg which represents an undemarcated operculum (TAYLOR & OMONIYI, 1970). The hole which is usually small and ragged at the commencement of the emergence process, is progressively widened and rounded to a diameter of 0.4-0.5 mm by the gnawing action of the parasite until it is large enough for the parasite to emerge without difficulty. Host eggs darken slightly after parasitisation but parasitised eggs are more easily distinguishable by the presence of the characteristic roundish emergence holes. Normal eclosion occurs along a cleavage line, the operculum being lifted at an angle to the convex part of the hemispherical egg. Parasites emerged both during the day and night. Parasites emerging in the laboratory were very active and copulation started soon after emergence. Oviposition was generally on freshly-laid host eggs but 1-3 day old eggs were also parasitised (the mean host egg developmental period is 5 days at 30 °C). Older eggs were apparently not parasitised although some developing nymphs which died before emergence were suspected to have been killed by the stinging of host eggs by the parasite. The ovipositor was usually inserted through the operculum. Oviposition was observed to last 2-14 minutes. ROTHCHILD (1970) observed that Gryon (Hadronotus) flavipes (ASHMEAD) oviposited in the host-egg through the lateral wall and not through the operculum. Female parasites, even in the presence of low host-egg density, did not show any aggressive or antagonistic behaviour and two females were frequently observed drumming and attempting to oviposit in a host-egg at the same time. This lack of mutual interference did not, however, lead to superparasitism and it appears that there is an effective mechanism that enables a parasite to identify a previously parasitised egg although no definite “marking” could be seen on parasitised eggs.