

Are Effective Parasites of *Heliothis* Eggs Found on Pigeonpea and Chickpea?

During surveys of pests and their natural enemies on dryland crops in Andhra Pradesh, and parts of Karnataka and Maharashtra States in India, conducted by ICRISAT Farming Systems entomology team from 1975 to 1980, it was observed that eggs of *Heliothis armigera* (Hb.) collected from pigeonpea and chickpea were generally free from parasitism, with an overall parasitism rate of less than 1%. This is in contrast with the *H. armigera* eggs collected from many other crops, including cowpea, mung bean, groundnut, maize, sorghum, pearl millet and cotton, in all of which the egg parasites, *Trichogramma* spp., were relatively common. Levels of parasitism were found to be particularly high in eggs collected from sorghum and cowpea, where up to 85% of the eggs were parasitized. The virtual absence of egg parasites on pigeonpea and chickpea is an important factor in permitting the build-up of *H. armigera* populations to the very high levels that are often found on these crops, leading to heavy yield losses. We are keen to discover why the egg parasites are not common on these crops, and any information that could help in this regard would be welcomed. Information from scientists who have sampled the *Heliothis* eggs on these crops for parasitism levels, particularly if anybody has found effective parasitism in any country or region, would also be welcomed.

- V.S. Bhatnagar (ICRISAT)

Eucelatoria sp., Parasitoid of *Heliothis* on Pigeonpea

One of the components of insect pest management that are being explored at ICRISAT is the augmentation of the populations of natural enemies. On pigeonpea the major pest in most areas is the polyphagous *Heliothis armigera*, and we are anxious to supplement the natural control of this insect.

The Indian National Program on Biocontrol had imported a tachinid fly, *Eucelatoria* sp., from the USA where it is a common and successful parasitoid of *Heliothis* spp. A culture of this insect was given to ICRISAT for rearing, testing, and release, and we can now report some progress in these studies.

We have had no difficulty in breeding the flies in our laboratory throughout the year, using field-collected and laboratory-bred *H. armigera* larvae as hosts. We have obtained up to 17 parasitoid pupae from a single host larva and have produced large numbers of healthy and active flies for experimentation and field release.

We have tested the ability of this insect to parasitize *H. armigera* larvae feeding on pigeonpea and chickpea in field cages. Female flies that had previously mated in laboratory cages were released into field cages in the ratio of one fly to five *H. armigera* fourth-instar larvae that were feeding on their host plants. The larvae were taken from the host plants 2-3 days after the parasites had been introduced and were subsequently reared in individual tubes in the laboratory and observed for parasitism. Although the overall parasitism was generally low (15%), the incidence in larvae taken from pigeonpea was much greater than in those from chickpea.

In a further series of tests we collected *H. armigera* larvae from chickpea, placed these on chickpeas and pigeonpeas in field cages, and again introduced *Eucelatoria*. Here again the larvae on pigeonpea were preferred, thus indicating that the parasite preferred to attack the larvae on that crop, regardless of their dietary history. Such preference for crops are known for many parasitoids, and there is a recent report that the odor from okra is more attractive to female *Eucelatoria* than that from cotton.

We are now attempting to establish this parasitoid in our fields and will monitor its populations on *Heliothis* larvae through the year. This pest feeds on all our mandate crops, on several other crops, and on weed hosts on this Center. We expect this experimentation to be the first of many attempts to augment the natural control of the major pests of pigeonpea in our search for alternatives to the costly use of pesticides.

- S. Sithanathan (ICRISAT)

Atylosia scarabaeoides: a Source of Resistance to *Heliothis armigera*

Heliothis spp. are generally the most damaging pests of pigeonpea throughout the world. At ICRISAT Center, where the polyphagous *H.*