

FLUCTUATION IN THE POPULATIONS OF PLUTELLA
XYLOSTELLA, TRICHOPLUSIA NI, BEMISIA TABACI
AND THEIR NATURAL ENEMIES IN JAMAICA

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NATURAL ENEMIES IN JAMAICA

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by
MUHAMMAD MUNIR ALAM
B.Sc. (Agri.) (Punjab University)
M.Sc. (Agri.) (Punjab University)

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Pesticide and Pest Research Group
Department of Life Sciences
Faculty of Pure and Applied Sciences
Mona.

ABSTRACT

Monthly monitoring of the populations of the diamondback moth (DBM), *Plutella xylostella*, at Douglas Castle, Castle Kelly and Bodles, Jamaica revealed that DBM population levels during 1988 to 1993 fluctuated between 2 - 10 larvae per plant in sprayed plots and 5 - 18 larvae per plant in unsprayed plots. The populations were generally low during the rainy season in September and October.

During the study period, 34 species of natural enemies of the DBM were recorded in Jamaica. Five species were primary insect parasitoids (*Trichogramma* sp., *Diadegma insulare* (Cresson), *Cotesia* sp., *Oomyzus sokolowskii* (Kurdj.) and *Trichospilus diatraeae* (C. and M.), 11 were insect predators (three species each of carabids, coccinellids, syrphids, and one species each of staphylinid and chrysopid), 15 species were spiders and three species were entomogenous fungi.

The parasites *D. insulare*, *Cotesia* sp. and *O. sokolowskii* were the most common ones, parasitizing significantly ($p=0.01$) more (35 - 60% in unsprayed than in sprayed (24 - 27%) fields.

Four species of hyperparasitoids, *Spilochalcis* sp., *Horismenus* sp., *Catolaccus* sp. and *A. fijiensis*, were also recorded attacking the pupae of *D. insulare*, *C. plutellae* and *Cotesia* sp.

Studies on the mortality of the DBM, due to parasites, predators and rainfall were carried out at two locations, revealed that biotic and abiotic factors caused an average mortality of 84 and 92% at Douglas Castle and Castle Kelly, respectively.

A larval parasite, *C. plutellae*, was successfully introduced and established at Bodles in 1989, as 48 and 54% of parasitism was achieved within 60 days of its first release.

The mean annual population of the cabbage looper (CL), *T. ni*, during 1988 - 1993 in three study areas ranged from 1.4 - 2.9 larvae/plant. Four species of parasites, *Cotesia* sp. (Braconidae), *Euplectrus platyhypenae* (How) (Eulophidae), *Brachymeria* sp. (Chalcididae) and *Winthemia* sp. (Tachinidae) were

found attacking 0 - 38% of the larvae and pupae of the CL. Two entomogenous fungi, *Entomophthorialis* sp. and *Beauveria bassiana* (Balsamo), were found attacking 0 - 34% of the larvae of *T. ni*.

The whitefly (WF), *B. tabaci*, is well distributed in Jamaica, feeding on 29 host plants belonging to 11 different families, the order of preference being Leguminosae > Solanaceae > Cruciferae > Cucurbitaceae > Labiatae. The pest transmitted the gemini virus, golden mosaic and yellow mosaic to various host plants, causing 30-100% crop loss.

Twenty one species of natural enemies of the WF were recorded; four were encyrtid and one of aphelinid parasitoid, 13 were predators (7 coccinellids, one chrysopid, 3 syrphids and 2 spiders). Along with these there were three species entomogenous fungi infecting the pest. Parasitism of the WF ranged from 5 - 70 %, fungal infection from 2 - 95%, and predation from 2 - 5 insect predators/plant.

Some 15 species of spiders were found feeding on the DBM and other crucifer pests in Jamaica. Among these *Lycosa* spp., *T. gonygaster*, *A. trifasciata*, and *Habronathus* sp. were the most abundant (1 - 2 spiders/m²). These spiders could consume 0.13 - 0.17 g of food or 14 - 18 larvae per day. However, the use of Selecron, Pegasus and Basudin reduced the spider populations by 43 to 100%.