



SRA-LGAREC UPDATES

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INDIGENOUS BIOLOGICAL AGENTS AGAINST SUGARCANE INSECT PESTS

Biological agents include various organisms. In sugarcane insects, spiders, micro-organism and entomopathogenic nematodes are the potential biological control agents. They are the natural enemies of the pests that limit its population. They will not always prevent damage in crop but they will reduce severity of damage and the frequency of pest outbreaks.

Potential biological agents collected in the sugarcane fields and are herein presented are classified as predators, parasites/parasitoids, entomopathogenic nematodes and pathogen or micro-organism.

I. Predators

The predators feed on many different species of insects. A single predator may feed on a number of insect prey, killing them quickly by eating them or sucking their body fluids. Predators are other insects and spiders.

Identified predators were species of spiders, mantid, bugs, beetles and earwigs.

II. Parasites/Parasitoids

Parasitic insects were categorized as to their of attack on the host stage: the egg parasitoids, larval parasitoids, nymphal parasitoids and adult parasitoids.

a. Egg Parasitoids

The parasitoid parasitizes the initial stage of the pests by laying their eggs in the host's eggs. The eggs blacken while the parasite larvae develop inside. What comes out of the parasitized egg is another egg parasitoid.

The egg parasitoids identified were 4 species of *Trichogramma* and 10 species of wasps.

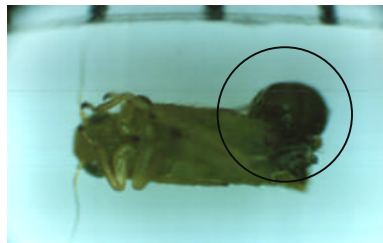
b. Larval Parasitoids

The larval parasitoids lay eggs on or into the host larvae. The parasitoid completes its development before the larvae pupates. Usually they pupate outside the body of the larvae in a cocoon.

The larval parasitoids are composed of 5 species of wasps and 2 Tachinids (flies).

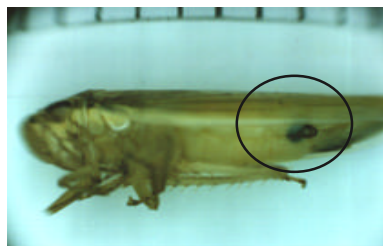
c. Nymphal Parasitoid

This parasitoid deposits one or two eggs inside the body of the leafhopper. As the parasite larvae grow inside the body, a black to grayish sac protrude from the abdomen. After 7-10 days, the sac splits and the whitish larva wriggle free. The larvae then pupates and secretes a whitish oval silk cocoon to cover the pupa on the plant.



d. Adult Parasitoids

The larvae of this parasitoid use their developed eyes, legs and sensory body hair to locate hosts. They bite into a host with their mandibles and penetrate into the body membrane. The wingless female remains inside the body of the leafhopper and only its head protrudes from the abdominal segment.



III. Entomopathogenic Nematodes and Pathogen

The collected entomopathogenic nematodes infest through natural body openings, mouth, anus, and spiracles through the cuticle at the softer intersegmental membrane region.

It kills the grubs in 3-4 days.

Grubs infected with the pathogen *Metarhizium anisopliae* become sluggish in movement, soft and pliable. Later the mycelium grow throughout the larva's body.

The grub then becomes rigid, mummified and eventually dies.

Trichogramma is mass produced in the SRA-LGAREC laboratory for distribution.

Entomopathogenic nematodes is currently undergoing field evaluation as to its effectiveness and likewise with *Metarhizium anisopliae* against white grubs (buc-an).

There are several considerations in the use of biological control agents against insect pests of sugarcane:

?? Synchronization of different natural enemies to different stages of insect pest could be a prime control strategy in insect pest management.

?? By combining the advantageous features of chemical control with biological methods, reduction of pests with a minimum disruption on the natural-enemy activities can be obtained, while a greater permanence on pest suppression may be achieved.

?? Conservation of identified natural enemies could create a "well-balanced" ecosystem, thus limit pest outbreaks.

?? The use of insecticides could be minimized, thus prevent environmental pollution and health hazard. More importantly will prevent the development of resistant and more destructive insect pest species. /glr

SOURCE:

M.C.ALBA and G. L. ROSALES.
1997. *Collection and Screening of Potential Indigenous Biological Control Agents Against Insect Pests of Sugarcane. Paper presented to the National DA-BAR Symposium, August, 1997, Quezon City.*