Some new records of predators of the spider mites of cassava

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The spider mites are the most serious pests of cassava in India. They include species that feed on the lower surface of the leaves such as *Tetranychus cinnabarinus* B. *(T. telarius)* and *T. neocaledonicus,* and those that feed on the upper surface of the leaves such as *Eutetranychus orientalis* and *Oligonychus biharensis.* Among these mites the important ones are *T. telarius* and *E. orientalis.* The infestation of a cassava crop by a mite complex results in severe plant defoliation, weakening of the plant, and consequent yield reduction ranging from 10-34% depending upon the intensity of the attack.

During the peak period of mite population, especially from January to March, a good number of natural enemies occur, including thrips and spiders which prey on mites and the coccinelid predator, *Stethorus gilvifrons,* observed earlier by Lal (1976). The new predators were collected and identified at the British Museum, London. The Thysanoptera was identified as *Scolothrips indicus* Priesner (Fam. Thripidae). Thrips prefer eggs and nymphs while spiders feed on the adults. Under laboratory conditions each *S. indicus* adult consumes on an average of 50 eggs/day. Thrips also capture nymphs. Spiders, *Poecilochroa* sp. (Fam. Gnaphosidae) and *Olios* sp. (Fam. Sparassidae), on the contrary, only feed on adult mites. The population of spiders in cassava fields is lower than that of thrips. These predators, especially thrips, have been observed as potential enemies capable of supressing the population of spider mites. A literature review indicates that the predators reported in this article are new records on spider mites of cassava. Bellotti and Schoonhoven (1978) reported other certain predators on the mite complex of cassava in the Americas.

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Inventory of phytophagous mites in cassava in Colombia*

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Research on mites in cassava was initiated at CIAT in 1973 in order to determine which of the species reported in cassava are causing economical damage and which are found in Colombia.

The ecological, biological and taxonomic studies of these mite species will lead to a better understanding of their population dynamics.

In 1978, Flechtmann reported a complex of 23 species of mites in cassava, identified all over the world. According to literature reviews and the latest reports, 40 species have been found in cassava. Up to now, the following species have been found in Colombia:

TETRANYCHIDAE

Allonychus braziliensis (McGregor, 1950)
Allonychus reisi Paschoal, 1970
Atrichoproctus uncinatus Flechtmann, 1967
Aponychus schultzi (Blanchard, 1940)
Eutetranychus banksi (McGregor, 1914)
Mononychellus bondari (Paschoal, 1970)
Mononychellus caribbeanae (McGregor, 1950)
Mononychellus mcgregori (Flechtmann & Baker, 1970)
Mononychellus tanajoa (Bondar, 1938)
Oligonychus gossypii (Zacher, 1920)
Oligonychus peruvianus (McGregor1917)
Tetranychus cinnabarinus (Boisduval, 1867)
Tetranychus mexicanus (McGregor, 1950)
Tetranychus urticae Koch, 1836

* Extracted from: "Contribución al Conocimiento de Algunos Acaros Fitófagos Encontrados en el Cultivo de la Yuca, *Manihot esculenta* Crantz, en Colombia", presented at VII Congreso Colombiano de Entomología, agosto 6-8, 1980, Bucaramanga, Santander del Sur, Colombia.

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TENVIPALPIDAE

Brevipalpus phoenicis (Geijskes, 1939)

ERIOPHYIDAE

Non-identified species

In Colombia, the most common mites that cause economic damage in cassava crops are *Mononychellus tanajoa, M. caribbeanae, Tetranychus urticae, T. cinnabarinus,* and *Oligonychus peruvianus.* The rest of the species are not considered important due to the fact that they only occur occasionally and prefer other existing hosts.

Cassava stemborers in Colombia

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Cassava stemborers can cause damage to cassava in the following ways:

- yield reduction
- plant lodging as they form galleries inside the stem
- loss of planting material or reduction of its quality
- entrance way for pathogens

Three species of Coleoptera and one of Lepidoptera have been reported in Colombia as cassava stemborers.

Coleoptera

Lagochirus sp. (Cerambycidae) is 20 mm in length and gray in color with a black lateral spot on each elytra. This species prefers to attack old and lignified material.

Eulechriops manihoti (Monte) (Curculionidae) is 2 mm in length and dark brown in color. This stemborer attacks weak or dead plants.

Coelosternus granicollis (Pierce) (Curculionidae) has only been reported in the region of the Llanos Orientales. The adult is 5 mm in length, grayish brown in color and the body is covered by yellow scales; this stemborer prefers weak plants attacked by diseases. Eggs are oviposited in the apical part of branches, deeply interred in the tissue. Larvae only feed on the pith causing dieback of thin branches. The larva forms a puparium with its excrements, commonly located near the base of the attacked branch. The presence of the insect is difficult to detect as excrements are not observed and dieback can also be caused by diseases. Studies on their economic damage have not been reported.

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Lepidoptera

Chilomina clarkei (Amsel) (Pyralidae) is the first Lepidoptera reported as a cassava stemborer. It has been found in Colombia (1) and in Venezuela (2, 3, 4). In Colombia it has been reported in the Llanos Orientales and in Tolima. Studies on the biology, ecology, and economic damage are being carried out at CIAT.

Biology and ecology

C. clarkei shows nocturnal activities; the adult measures approximately 20 mm in length, has a light brown color with lines and a dark central spot on the front wings. The male and female do not show sexual dimorphism but can be distinguished by their genitalia. A female can oviposit up to 350 eggs with a mean of 130 under laboratory conditions. Eggs are oviposited in protected sites, such as around buds or underneath the stipules. The incubation period of eggs is six days and fertility is almost 100%. After eclosion, larvae remain around the buds, covering themselves with a web. The first four larval instars develop outside the stem, and after the fifth instar, larvae penetrate into the pith in the stem where they complete their cycle. The larval period shows eight instars and lasts approximately two months. Pupae are found inside the stem in a silk puparium and last from 12-16 days. Male longevity is four days and female, five days up to 12 days, in case they are not fertilized.

The population fluctuates during the year, reaching peak populations during the rainy season. Survival of larvae to adults also varies between 1% during the dry season to 16% during the rainy season.

Natural enemies

Brachymeria sp. (Hymenoptera, Chalcididae) parasitizes pupae year round.

There is another unidentified species from the order Hymenoptera and family Braconidae which is an endoparasite of larvae.