

# *Polyphagotarsonemus latus*

## INTRODUCTION

The broad mite *Polyphagotarsonemus latus* (Banks), is a serious pest of a wide range of crops. However, solanaceous crops such as tomato, sweet peppers and melongene are mostly affected. The pest is fairly well distributed worldwide. It was recorded in the United States and the West Indies since 1964. In Trinidad, it was first recorded in 1984 (Jones, 1988).

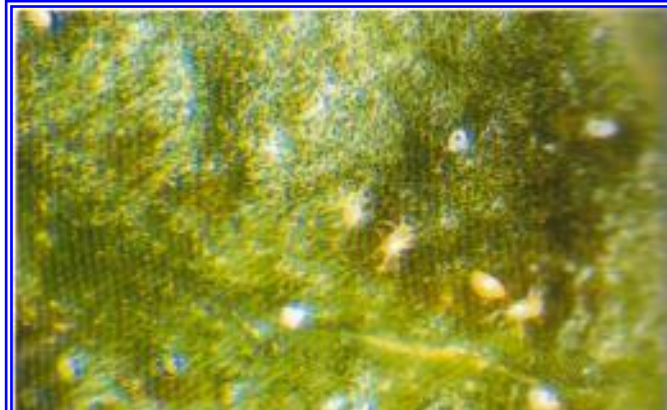


Fig.1 Translucent Broad mites  
(Photo credit:-Phillipe Ryckewaert)

## Identity

Authority	: Banks
Classification	
Kingdom	: Animalia
Phylum	: Arthropoda
Class	: Arachnida
Order	: Acarina
Family	: Tarsonemidae
Genus	: <i>Polyphagotarsonemus</i>
Species	: <i>latus</i>
Synonyms	: <i>Hemitarsonemus latus</i> (Banks), <i>Tarsonemus translucens</i> (Green) <i>Hemitarsonemus translucens</i> , <i>Polyphagotarsonemus translucens</i> , <i>Tarsonemus latus</i> , <i>Tarsonemus phaseoli</i> .
Common names	: broad mite, yellow tea mite, citrus silver mite, tropical mite, chilli mite, jute white mite, rubber leaf mite. Amarillo; Acarien jaune.
Role	: Pest

## **Signs & Symptoms**

Ryckewaert (1998)

The feeding punctures of the broad mite severely deform young buds and leaves. Curling, crinkling and scarring of the underside of the leaves are evidence of damage by the broad mite. Stunted growth and the development of witches broom-like growth in peppers has been reported by Jones (1988).

## **Morphology**

Ryckewaert (1998)

The adult mite is approximately 0.2 mm long with 4 pairs of legs shiny amber in colour and bearing a white mid-dorsal patch almost invisible to the naked eye. The rapidly moving nymphs are soft bodied and white. In very young nymphs, the denser, white mid-dorsal patch is not easily seen but it is more apparent in older nymphs. This white patch increases in size as the nymph matures. Eggs are colourless and oval shaped and studded with rows of white tubercles.

## **Biology & Ecology**

Gerson (1992)

The mites are very small, the largest stage, the fully developed female being less than 0.25 mm long. The eggs are laid singly on the underside of young leaves or the protected side of fruits and are placed in depressions, even if these are almost imperceptible. The eggs, which are relatively large in relation to the size of the female, adhere to the plant tissue by a flattened surface. Hatching occurs after 2-3 days to disclose a minute, whitish, pear-shaped larva with three pairs of legs. These larvae feed for 2-3 days, usually near their eggshells, and they turn into a quiescent 'pupal' stage or nymph, while the 8-legged adult forms inside the larval skin. Adult males emerge after 2-3 days and migrate to young leaves, each male transporting an advanced female nymph, which is lifted off the leaf surface with the males strong hind legs, and carried aloft over the posterior part of its body, held firmly by a sucker-like genital organ. Males that have not acquired a female nymph of their own frequently attempt to rob other males of their burden, but usually without success. Copulation occurs immediately after the female emerges from the nymphal skin. If fertilization is delayed, females can still produce eggs, which, however, result in only male progeny.

The life cycle, from egg deposition to emergence of adult may be as short as 4 - 5 days in the warm weather, extending to 7 - 10 days in cold periods. The females are relatively sedentary in comparison with the males. They lay 2 - 4 to four eggs per day throughout their life span of up to 10 days.

The larvae and adults are translucent when newly emerged, but males become yellowish-brown in colour and females yellowish-green (Fig 1). There is a tendency for the body colour to be affected by that part of the plant on which the mite is feeding and this results in females, in particular, being at times dark green.

In areas with marked seasonal contrasts, overwintering is achieved by females persisting on the lower leaf surfaces and in bud scales and axils.

## Dispersal/Vectors

Dispersal via infested plant material transported by wind and people

## Management

### Chemical Control

The broad mite is not susceptible to some dinitrophenol compounds and synthetic pyrethroids. Fenbutatin, diazinon, dicofol and kelthane, have been effective in the control of mites. Pesticides should be carefully applied so they do not interfere with natural enemies that offer biological control of the pest complex.

### Biological Control

Throughout the world specific natural enemies are not known ( Waterhouse and Norris 1987) Locally occurring mite predators give satisfactory control in many areas. Two natural enemies – *Euseius stipulatus* and *Typhlonomus ovalis* are being evaluated as biocontrol agents of the broad mite.

### Cultural Control

Weed control as part of an overall management practice may affect the broad mite population since it is known that some weeds harbour the pest.

## Host Notes

Jones (1988)

The broad mite has been recorded on a wide range of crops – fruit and vegetable crops throughout the tropical and sub-tropical world. Damage to pepper, eggplant, potato, citrus and some ornamentals (Dahlia, Gerbras) can be quite severe. *Bidens*, a common weed may serve as a reservoir host between nplant croppings.

## Pest Significance and Phytosanitary Risk

It poses a serious threat to vegetable, fruit and ornamental production. Mites feed by piercing plant cells and sucking the sap that oozes from the wound (Waterhouse and Norris, 1987). Reduction in photosynthesis and instability of water balance are some the damaging effects to plants. Feeding damage also causes terminal leaves and flower buds to become cupped and distorted. As a result of feeding injury, corky brown areas appear between the main veins on the underside on the leaf. Young foliage sometimes becomes rust colored and nearly always is deformed. Blooms abort, and the plant growth is stunted. Damaged leaves often become discolored, thickened and brown (Iacob, 1978).

Damage ot flowers and fruits differs among plants. On macadamia, flowers and leaves may appear corky brown or bronze colored. On lemon fruits, feeding results in silvering of the fruit that greatly reduces the market value even though the fruit is otherwise unaffected (Waterhouse and Norris, 1997). On beans, extensive feeding on fruit results in a purplish or dark brown appearance of the pods. The broad mite is considered as a pest of substantial economic importance.

The broad mite does not vector any known plant virus diseases (Waterhouse and Norris, 1987; Higa and Namba, 1970).

It becomes a risk when live plants and fruits are traded between countries. The species has a low phytosanitary risk.

### Distribution

This mite has a cosmopolitan distribution. It is known to occur in North and South America, the West Indies, most of Africa, Australia, Bermuda, Brazil, Guyana, Europe, Fiji, Hawaii, India, Indonesia, Malaysia, Marianas, Mauritius, Pakistan, Philippines, Sri Lanka and Taiwan (Anon. 1964).

Bangladesh, Canada, China (Yang and Chen 1982), Japan, Solomon Is. In the Pacific, the broad mite is known also from the Cook Is., French Polynesia, Kiribati, New Caledonia, Papua New Guinea, American and Western Samoa, Tonga, Vanuatu, and Wallis and Futuna Is, but it is not recorded from the Marquesas, Tokelau or Tuvalu (Waterhouse 1985)..

### Bibliography

- Brown, R.D. & Jones, V.P. (1983) The Broad Mite on Lemons in Southern California. *California Agriculture*. **37(7/8)** 21-22.
- CIE (1986) Distribution Maps of Plant Pests, No. 191. *CAB INTERNATIONAL*, Wallingford, UK.
- Gerson, U. (1992) Biology and control of the broad mite, *Polyphagotarsonemus latus* (Banks) (Acari: Tarsonemidae). *Experimental & Applied Acarology*, **13(3)**, 163 – 178.
- Hill, D.S. (1983) *Polyphagotarsonemus latus* (Banks). pp. 504. In: *Agricultural Insect Pests of the Tropics and Their Control*. Cambridge University Press. 746 pages.
- Iacob, N. (1978) New Mite Pests on Greenhouse Crops and on Grapevine (abstract only). *Rev. Appl. Entomol.* **Ser. A. 67(12)**, 595-596.
- Jones, M.T. (1988) Status of the broad mite, *Polyphagotarsonemus latus* (Banks) – a threat to the vegetable fruit and ornamental industry in Trinidad. *2<sup>nd</sup> Ann. Sem. NIHERST*. **Nov 10-12**. 1988.
- Lavoipierre, M.M.J. (1940) *Hemitarsonemus latus* (Banks) (Acarina), a Mite of Economic Importance new to South Africa. *J. Entomol. Soc. Southern Africa*. **3**, 116 - 123.
- Lindquist E.E. (1986). The world genera of Tarsonemidae (Acari: Heterostigmata): a morphological, phylogenetic, and systematic revision, with a reclassification of family-group taxa in the Heterostigmata. *Memoirs of the Entomological Society of Canada*, No. 136:517pp.
- Liu T.S., Wang WJ, Wang, Y.S., (1991) Survey on the hosts damaged by the broad mite and its control. *Plant Protection Bulletin (Taipei)*, **33(4)**, 344-353.
- Waterhouse, D.F. & Norris, K.R. (1987) 31: *Polyphagotarsonemus latus* (Banks). In: *Biological Control Pacific Prospects*. Inkata Press: Melbourne. 454 pp.

### Web Resources -

[http://ecoport.org/EP.exe\\$EntFull?ID=19924](http://ecoport.org/EP.exe$EntFull?ID=19924)  
[www.sel.bare.usda.gov/acari/content/board/b.html](http://www.sel.bare.usda.gov/acari/content/board/b.html)