

SOME DATA ON PLANT FEEDING MITES AND THEIR MAIN  
PREDATORS IN THE SOUTH PACIFIC ISLAND AREA

by

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Because of their small size plant feeding mites often go unnoticed. Yet they are a pest which may have serious economic consequences on crops, when they reach outbreak status.

Sudden outbreak is the result of biological imbalances, generally brought about by a change in agricultural practices, in particular higher rates of insecticide application. Most pesticides have little or no effect on mites, while destroying the majority of their predators.

These imbalances can also occur as a result of abnormal climatic conditions, such as an exceptionally severe drought, or be due to accidental introduction of a species. These mites belong to three superfamilies :

- The Tetranychoidae, further divided into the families Tetranychidae, Tenuipalpidae and Tuckerellidae ;
- The Eriophyoidea
- The Tarsonemoidea

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Their predators may be other mites, or insects belonging to various orders.

These tiny mites, with the exception of Eriophyidae, are collected into small glass tubes (5 cc approx.) filled with 70 % alcohol, sealed and labelled. The name of the host plant, the place and date of collection are shown on the label. If no laboratory is available for the sorting out, the infested leaves may be preserved in a larger sized tube containing 70 % alcohol.

Eriophyidae - infested plant materials are simply dried, as one would botanical specimens for a herbarium, and kept in strong brown paper envelopes.

## 1. PLANT FEEDING MITES

### 1.1. Tetranychoida

Only the first two families mentioned, Tetranychidae and Tenuipalpidae, can cause serious damage in cultivated areas.

Tetranychoida attack the cells of the leaf parenchyma which leads to the appearance of light-coloured patches on the leaf surface. The leaves eventually turn lead grey and sometimes drop off prematurely.

#### 1.1.1. Tetranychidae : "red spider mites"

Females are visible to the naked eye (length : 0.4 to 0.5 mm) and usually red or reddish in colour, except for Oligonychus gramineus and Tetranychus lambi females, which are greenish.

Species of the Tetranychus genus generally live on the under surface of leaves, while Oligonychus species are normally found on the upper surface. All weave more or less abundant webs, to protect themselves from predators.

Out of about 30 species inventoried in the South Pacific area, 15 or so are injurious. The 10 main ones have been listed hereunder.

- Panonychus citri on Citrus, in Papua and New-Guinea
- Oligonychus coffeae on breadfruit and coffee, is pantropical
- Tetranychus lambi on taro, cassava, bean, etc... is found from Australia to Tahiti
- Tetranychus ludeni on bean, Solanaceae, etc... is pantropical

- Tetranychus marianae polyphagous, exists in all the tropical islands of the Pacific
- Tetranychus neocaledonicus polyphagous and pantropical
- Tetranychus urticae polyphagous and cosmopolitan ; has apparently been introduced only into New-Caledonia
- Tetranychus piercei from Southern Asia ; is common on cassava in Papua and New-Guinea
- Tetranychus tumidus lives on Solanum in Samoa
- Tetranychus yusti lives on cassava in Tahiti and the Cook Islands.

#### 1.1.2. Tenuipalpidae : "flat mites"

These are hardly distinguishable with the naked eye (0.3 mm in length). They are flat and do not produce a web. Only 3 out of about 10 known species are common on South Pacific island plants. All three are reddish and live on both sides of the leaf, as well as occasionally, on leafstalks, stems and twigs :

- Brevipalpus californicus
- Brevipalpus obovatus
- Brevipalpus phoenicis

B. phoenicis is the commonest ; it is collected on Citrus.

Another species worthy of special mention is Dolichotetranychus floridanus which attacks the base of pineapple leaves, often causing the plant to rot. D. floridanus has been introduced into Fiji and into the Cook Islands.

#### 1.2. Eriophyoidea : "four - legged mites"

These are visible only under a stereo-microscope. They have only two pairs of legs and a worm-like body. As a rule, a given species has only one host plant. They are found on the leaves and also on the fruit, the twigs and in the buds, causing - according to the species involved - patches of rust, blistering, or twig deformations. They can also act as vectors of virus diseases.

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About 20 species have been identified to date in the South Pacific islands, but there is no doubt that their number is in fact far greater. We shall here list only 7 important species :

- Colomerus novaehbridensis lives on the bracts of young coconuts, in the New Hebrides, and may cause the nuts to drop prematurely
- Eriophyes hibisci, produces an erinum and deformations in the leaves and twigs of Hibiscus rosa-sinensis, throughout the region
- Eriophyes litchii, causes an erinum on leaf undersurfaces of litchi trees in Tahiti
- Eriophyes mangiferae, lives in the leaf buds of most mango trees causing twigs to become stunted.
- Eriophyes sheldoni, deforms leaves and twigs of citrus trees in Fiji
- Phyllocoptruta oleivora, causes reddish patches on the rind of ripe oranges and silverish patches on the rind of limons, throughout the region
- Aculops lycopersici "tomato russet mite" lives on tomatoes, egg plants and potatoes throughout the region, giving the foliage and stems a characteristic bronzing.

### 1.3. Tarsonemidea

These range from 0.1 to 0.3 mm in length and have a translucent body, and are therefore visible only by means of a stereo-microscope.

We shall mention only two of the many tarsonemids found in the region :

- Polyphagotarsonemus latus is found in all tropical areas. In the South Pacific islands it chiefly attacks capsicum, tomato, egg plant, passion-fruit but also Citrus, coffee, etc... It lives and feeds in the buds and young leaves. Its feeding injuries produce curling and crinkling of the foliage.
- Steneotarsonemus ananas lives in pineapple bracts, in New-Caledonia, often causing the plant to rot.

## 2. PREDATORS

### 2.1. Phytoseiidae

Phytoseiulus macropilis appears to be the most active of the phytoseiid predators of Tetranychidae. Other species, such as Amblyseius largoensis or Amblyseius deleoni are far less effective. A recent trend is to import totally or partially insecticide-resistant phytoseiids with a view to integrated control. Attempts to establish Typhlodromus occidentalis, which is resistant to organo-phosphorus compounds, are being made in New-Caledonia.

### 2.2. Insects

#### 2.2.1. Coccinellidae

Species of the genus Stethorus prey almost exclusively on Tetranychidae. They are quite common in the large islands where their food is constantly available.

Two species are known in New-Caledonia : Stethorus vagans and S. nigripes ; two in the New-Hebrides : S. vagans and S. gutierrezii ; one in Fiji : S. fijiensis ; one in Tahiti : S. siphonulus.

#### 2.2.2. Staphylinidae

The Staphylinid predators of Tetranychidae all belong to the genus Oligota. Most specimens collected in the South Pacific islands were identified as being of the cosmopolitan species Oligota flavicornis.

#### 2.2.3. Thysanoptera

Several species of the genus Scolothrips are regarded as useful for control of Tetranychidae : Scolothrips sexmaculatus in Fiji ; S. pallidus in Samoa and Tahiti ; Scolothrips sp. in New-Caledonia.

#### 2.2.3. Cecidomyiidae

The larvae of several Cecidomyiidae species play a secondary part in Tetranychidae control. Only one species has so far been identified, in Tahiti : Therodiplosis persicae.