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ERIOPHYES TILIAE (PGST.) ON *TILIA PLATYPHYLLA* SCOP. IN CONCEPCION, CHILE (ACARI, ERIOPHYIDAE)[1]

Presencia de Eriophyes Tiliae (Pgst) en Tilia platyphylla Scop. en Concepción, Chile (Acari, Eriophyidae

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ABSTRACT

The presence of *Eriophyes tiliae* (Pangenstecher) causing nail-galls on *Tilia platyphylla* Scop. at Barrio Universitario, Concepción, Chile is reported. A brief recognition diagnosis of the adult female with the aid of Scanning Electron Microscope photographs and some biological aspects are included.

KEYWORDS: Eriophyidae. *E. tiliae*. *Tilia platyphylla*. Concepción-Chile.

RESUMEN

Se reporta la presencia de *Eriophyes tiliae* (Pangenstecher) causante de agallas en hojas de *Tilia platyphylla* Scop. recolectadas en el Barrio Universitario, Concepción, Chile. Se entrega una breve diagnosis de reconocimiento de la hembra adulta, apoyada con fotografías obtenidas con el Microscopio Electrónico de Barrido y algunos antecedentes de su biología.

INTRODUCTION

The great majority of gall makers mites are in the Eriophyoidea (Prostigmata), being many species serious plant pests and vectors of virus diseaes. Lindquist, 1988 (pers. comm.) mentioned that the eriophyoid mites actually belong to three families: Phytoptides (= Nalepellidae, Sierraphytoptidae), Eriophyidae and Diptilomiopidae (= Rhyncaphytoptidae). They differ mainly in the position and number of prodorsal setae, rostrum length, and location and length of the cheliceral stylets.

Among the Eriophyidae, *Eriophyes* von Siebold is one of the largest genera, with species in all regions of the world and with a wide host range. One of the species is *Eriophyes tiliae* described by Pagenstecher in 1857 as *Phytoptus tiliae* and by Nalepa in 1920 as *Eriophyes tiliae typicus* (Pgts.) based on samples collected from *Tilia platyphylla* Scop. in Germany. Different authors like Keifer (1952),

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Thomsen (1976) and Keifer, Baker, Kono, Delfinado and Styer (1982), cited this species as *E. tiliae* (Pgst.), *E. tiliae tiliae* (Pgst.) and *Phytoptus tiliae* Pgst. respectively. Previous records of this species are mainly from Europe and U.S.A. (Keifer, 1946, 1951; Baker and Wharton, 1952).

The present note reports the presence of *Eriophyes tiliae* (Pgst.) found on leaves of *Tilia platyphylla* Scop. collected at Barrio Universitario, Concepción, Chile. The adult female is described with the aid of SEM photographs.

MATERIAL AND METHODS

A total of 53 leaves of *Tilia platyphylla* Scop. collected at Barrio Universitario in Concepción, Chile betwen November 1992 and April 1993 was examined under stereomicroscope.

Several specimens (more than 250) of *E. tiliae* (Pgst.) were extracted by hand from the "linden nail-galls". Some specimens were cleared and mounted in Nesbitt and Berlese solutions respectively and sealed with nail polish on microslides which are deposited in the Museo de Zoología, Universidad de Concepción, Chile (MZUC). Others were fixed and embedded for the analysis with the Scanning Electron Microscope. Photographs of nail galls on linden leaves were also obtained. The used terminology follows Keifer (1952) and Thomsen (1976).

ABREVIATIONS:

al	= amedian line
As	= accessory seta
C	= chelicera
DR	= dorsal ring
Ds	= dorsal seta
F	= featherclaw
Fcx	= fore coxa
Gc	= genital cover flap
Gs	= genital seta
Hcx	= hind coxa
La	= lateral seta
ls	= longitudinal scoring
M	= microtubercles
me	= median line
MZUC	= Museo Zoología, Universidad de Concepción
PS	= prodorsal shield
R	= rostrum
r	= rays
Rs	= distal seta of rostrum
S	= solenidion
sl	= submedian line
scx_{1-3}	= seta coxa 1-3
Vs_{1-3}	= ventral seta 1-3
VR	= ventral ring

RESULTS AND DISCUSSION

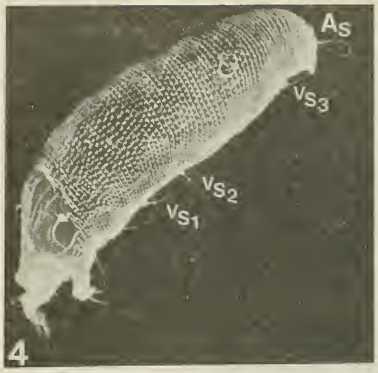
Eriophyes tiliae (Pgst.) is an eriophid mite which causes the formation of elongate, distally atenuate and ramdonly distributed leaf galls known as "nail-galls" (Fig. 1). The linden galls are greenish to reddish or brownish (Figs. 2, 3). In November some greenish galls measuring more than 1.5 mm were observed with an adult female (protogyne); larger galls presented eggs and mites and smaller galls were empty. The number of eggs was variable, betwen 46 to 60 per gall. The mature reddish galls measuring around 1 cm were found mostly in February, each of them with several hundred adults and with the females predominating.

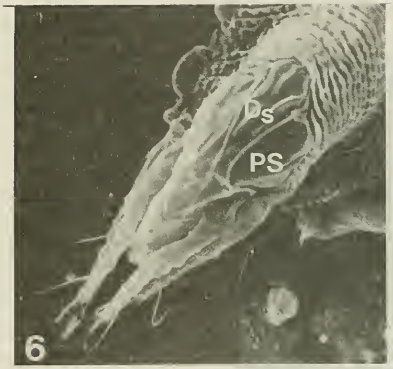
FEMALE: It is characterized by its thin, wormlike body (Fig. 4). Body length 143 - 172 µ. Short rostrum (R), with a distal seta (Ps) (Fig. 5). Prodorsal shield (PS) wider than longer (Fig. 6), without an anterior and elongate projection or lobe over the rostrum; with two dorsal setae (Ds) on dorsal tubercles longer than wider set a little ahead of the rear shield margin. Dorsal setae directed up and ahead, divergent (Fig. 7). Median line (me) distinct, ending in a dart-shaped mark (Fig. 5); amedian lines (al) notorius, more than the submedials, laterally expanded at level of the dorsal seta base reaching the posterior margin of the prodorsal shield (Fig. 8); submedian line (sl) forked in front of dorsal tubercle (Fig. 8).

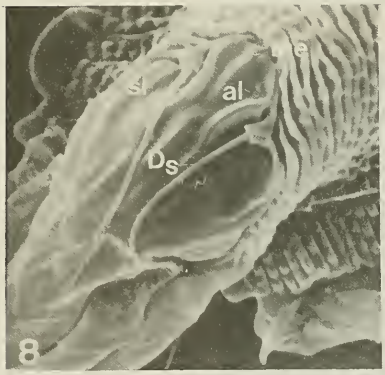
Ventrally (Fig. 9), coxal area with granulations; anterior coxa (Hcx) with 2 pairs of setae, coxal seta 2 (scx_2) two times longer than scx_1; posterior coxa (Fcx) with one long seta, two times longer than scx_2. Featherclaw (F) 4-rayed (r) and with one soleidion (S) longer than the claw length (Fig. 10); first setiferous coxal tubercle and seta present; foretibial seta present.

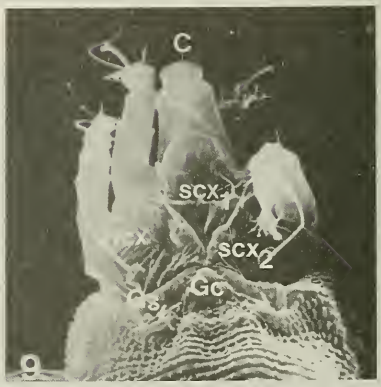
Abdomen with 66 - 72 dorsal rings (DR) and 65 - 75 ventral rings (VR) (Fig. 4); microtubercles (M) ovalated, inserted on medial region of each region (Fig. 11). Histerosomal rings (DR) posterior to third

Figs. 1-3: Galls on upper surface of *Tilia platyphylla* Scop., "linden".









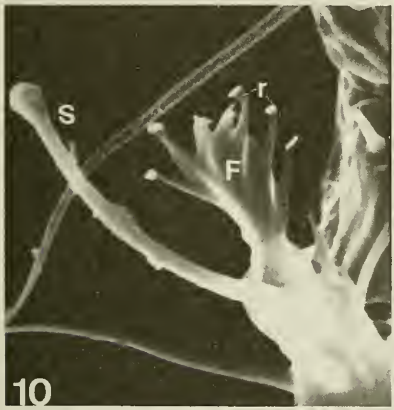
Figs. 4-9: *Eriophyes tiliae* (Pgst.), Female. Fig. 4. Dorsolateral view (720x); Fig. 5. Lateral view, anterior part of the body (1200 x); Fig. 6. Dorsal view of shield (1200 x); Fig. 7. Lateral view of dorsal shield and body rings (1400 x); Fig. 8. Dorsal view prodorsal shield (2100 x); Fig. 9. Ventral view anterior region (2000 x).

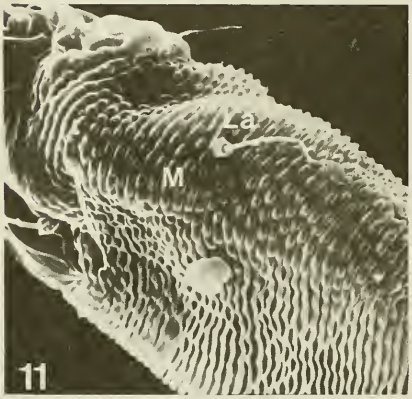
ventral seta (Vs_3) wider than the ventrals (VR) (Figs. 12, 13). While the dorsal microtubercles are weaker, the ventral ones are longer (Figs. 12,13). Genital at normal distance from coxae, with 6 - 8 longitudinal scorings (ls) on genital coverflap (Gc); rings in region directly anterior to genitalia with microtubercles; genitalia 20 µ wide, 12 µ long; genital seta (Gs) 8 µ long. Lateral seta (La) 23 µ long on ring 10 (Fig. 11); first ventral seta (Vs_1) 35 µ long on ring 24; second ventral seta (Vs_2) 25 µ long on ring 42 and thrid ventral seta (Vs_3) 15 µ long on ring 6 from rear (Fig. 4); accessory seta (As) 15 µ long.

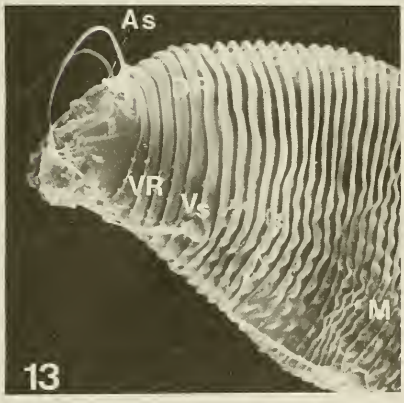
Foreleg 40 µ long; tibia 8 µ long; tarsus 5 µ long. Hindleg 36 µ long; tibia 5 µ long, tarsus 5 µ long.

Eventhough it has been assumed that the dispersal to new hosts takes place during summer, when the mites are found freely on the leaf and can be carried away by the wind or insects (Thompsen, 1976), none freely mites were found on the examined linden leaves and all galls were entire, without opening points. Probably this is due to the fact that summer 1993 in Concepción, Chile was not warm enough to be favorable for dispersion.

E. tiliae (Pgst.) is apparently widely distributed (Keifer, et. al., 1982).







Figs. 10-13: *Eriophyes tiliae* (Pgst.), Female. Fig. 10. Featherclaw from the first leg (9200 x); Fig. 11. Lateral view of body surface with the microtubercles (2000 x); Fig. 12. Posterolateral view of posterior part of the body (2000 x); Fig. 13. Lateral view of histerosomal rings and microtubercles (2000 x).

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BIBLIOGRAPHY

Baker, E. W. & Wharton, G. W. 1952. An Introduction to Acarology. MacMillan Co. pp. 147-158.

Pagenstecher, H. A. 1857. Uber Milben bensoders die Gattung *Phytoptus*. Verh. Ver. Herdelberg 1: 46.

Nalepa, A. 1920. Zur Kenntnis der Milbengatten einiger Ahornarter und ihrer Erzenger. Marcellia 19: 3-33.

Keifer, H. H. 1946. A review of North American Eriophyid mites. Jour. Ec. Ent., 39: 563-570

Keifer, H.H. 1951. Eriophyid studies XVII. Bull. Cal. Dept. Agr., 40: 93-104.

Keifer, H. H. 1952. The eriophyid mites of California (Acarina: Eriophyidae). Bull Calif. Insect. Survey 2 (1): 123 pp.

Keifer, H. H., Baker, E. W., Kono, T., Delfinado, M. & Styer, W. E. 1982. An illustrated guide to plant abnormalities caused by Eriophyid mites in North America. USDA, Agriculture Handbook 573: 179 pp.

Thompsen, J. 1976. Morphology and biology of the gall mite *Eriophyes tiliae tiliae* Pgst. (Acarina, Trombidiformes, Eriophyidae). Ent. Meddr. 44: 9-17.