

New records of mites (ACARI: PROSTIGMATA) on *Vitis* sp. (L.) in Brazil

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Abstract

Tetranychus mexicanus (McGregor, 1950) (Tetranychidae) was found on leaves of grapevines (*Vitis vinifera* L. and *V. labrusca* L.) in Caxias do Sul, RS, Brazil. This is the first register of this mite species occurring on grapevine in South Brazil. *Phytonemus pallidus* (Banks, 1898) and *Tarsonemus confusus* Ewing, 1939 (Tarsonemidae) were found on leaves grapevines (*V. vinifera*) in Sant'Ana do Livramento, RS, Brazil. This is the first register of these tarsonemids species occurring on grapevine in Brazil.

Keywords: *Tetranychus mexicanus*, *Phytonemus pallidus*, *Tarsonemus confusus*, grapevine.

Novos registros de ácaros (ACARI: PROSTIGMATA) em *Vitis* sp. (L.) no Brasil

Resumo

Tetranychus mexicanus (McGregor, 1950) (Tetranychidae) foi coletado em folhas de videiras (*Vitis vinifera* L. and *V. labrusca* L.) em Caxias do Sul, RS, Brasil. Este é o primeiro registro desta espécie ocorrendo em videira no sul do Brasil. *Phytonemus pallidus* (Banks, 1899) e *Tarsonemus confusus* Ewing, 1939 (Tarsonemidae) foram encontrados em folhas de videira (*V. vinifera*) em Sant'Ana do Livramento, RS, Brasil. Este é o primeiro registro destas espécies de tarsonemídeos ocorrendo em videira no Brasil.

Palavras-chave: *Tetranychus mexicanus*, *Phytonemus pallidus*, *Tarsonemus confusus*, videira.

The production of grapes in Brazil concentrates mainly on the Southern, Southeast and Northeast Regions of the country. Rio Grande do Sul is the leading State in grapes and wines production in Brazil. The Serra Gaucha region is the largest producer of grapes and vine, but recently vine grape production has been increased in Pampa region at the western border of the state. With the increase of productivity and quality of grapes, mites infestations becomes ever greater focus due they negative effect on vineyard plant. Until now, few studies aimed the enhancement of knowledge of vineyards and their mite fauna in Brazil.

The specimens were found and collected at vineyards of *Vitis vinifera* (Cabernet Sauvignon and Sémillon varieties) and *V. labrusca* (Isabella variety) (28°08'19''S 50°59'59''W), in Caxias do Sul, Serra Gaucha Region and vineyards of *V. vinifera* (Cabernet Sauvignon and Merlot varieties) (30°46'14''S 55°22'11''W) in Sant'Ana do Livramento, Campanha Region, RS.

Monthly samplings of grapevines leaves were carried out during the period of October/2009 to May/2010 in Caxias do Sul and January to May of 2010 and September/2010 to March/2011 in Sant'Ana do Livramento. Each sample consisted of three leaves removed from 30 plants in each vineyard. The leaves were placed in plastic bags, kept in cooler Box with Gelox® under low temperature ($\pm 12^{\circ}\text{C}$) and transported to the laboratory, where the material was stored under refrigeration for up to seven days until examination under a stereoscopic microscope for extraction of mites. Mites were collected with fine-tipped paintbrush and mounted with Hoyer's medium in microscopic slides (Jeppson et al. 1975). The identification was made with help of dichotomics keys (Baker & Tuttle, 1994, Zhang, 2003) and confirmed by Dr. Jéferson L. C. Mineiro from Laboratory of Acarology, Biological Institute, Campinas, SP and Dr. Noeli Juarez Ferla from University Center UNIVATES, Lajeado, RS. Vouchers were deposited in the reference collection of the Agricultural Laboratory of Acarology, Plant Protection Department, UFRGS.

TETRANYCHIDAE Donnadieu, 1875

***Tetranychus mexicanus* (McGregor, 1950)**

Septanychus mexicanus McGregor, 1950: 323

Tetranychus mexicanus Pritchard & Baker, 1955: 411

Geographical distribution

The spider mite *T. mexicanus* has a geographical distribution restricted to the American continents, being registered from South America to United States (Bolland et al., 1998).

Diagnostic characteristics

The females can be recognized by the presence of two duplex setae in middle of tarsus I and dividing it in three portions, presence of four proximal tactile setae on tarsus I and the presence of a large dorsal-median spur close to the empodial claw on tarsus I (Vacante 2010). The colour of females is quite variable depending on the hosted species. For this reason the colour can vary from intense red-orange when feeding on sweet limes leaves, to green-brow with black spots when feeding on orange-tree leaves (Moraes & Flechtmann 2008). Males are always smaller than females and have a typical aedeagus with the axis of the knob parallel to that of the shaft, with shorter anterior angulation and acutely pointed and longer posterior and also acutely pointed distal portion (Vacante 2010).

Hosts and economic importance

Actual registers have indicated the presence of this species on 108 spontaneous and cultivated plants (Mendonça et al., 2011, Migeon & Dorkeld, 2010). In Brazil, *T. mexicanus* can be found on several species of cultivated plants, such as citrus, apple, sugar cane, coconut, cotton and ornamental crops (Moraes & Flechtmann 2008, Feres et al 2009). On citrus trees, the species has been frequently registered in São Paulo State where infested plants leaves present a light green color and a slightly down-curved shape on the border of the leaves; on lower surface of the leaves, silk-webbings are often present and the on upper surface some chlorotic areas are visible. Some of them usually develop into colored stains (Moraes & Flechtmann 2008, Parra et al 2003). In the case of high infestation levels, it is possible to develop some necrosis and defoliation (Parra et

al 2003). In spite of this, Moraes & Flechtmann (2008) confirm that in a general way, this mite doesn't constitute a true citrus phytosanitary problem, although it's quite frequent occurrence. In grapevines, its first record was in *V. vinifera* at Pirapora, MG (Mendonça et al., 2011).

Material examined

Brazil, Rio Grande do Sul. Caxias do Sul: 7♀, II.2010; 2♀, IV.2010; in *V. vinifera*, Semillon; 1♂, 3♀, I.2009; 1♂, I.2010; 1♂, III.2010; in *V. vinifera*, Cabernet Sauvignon; 1♀, 1 larvae, III.2010, in *V. labrusca*, Isabel.

TARSONEMIDAE Kramer, 1877

***Phytonemus pallidus* Banks, 1898**

Tarsonemus pallidus Banks, 1901:294

Tarsonemus fragariae Zimmerman, 1905: 91

Steneotarsonemus pallidus (Banks) Beer, 1954:1267

Phytodromus pallidus (Banks), Lindquist, 1987:291

Geographical distribution

This species can be found in North and South Americas, Asia, Australasia, Europe and Africa (Denmark, 2000, Zhang, 2003).

Diagnostic characteristics

The adult females are about 250 µm long, ovoid, pale to yellowish brown and have two pairs of setae on dorsal propodosoma; the second pair much longer than setae on dorsal hysterosoma. The trichobothria are capitates, partly or not covered by lateral margins of the prodorsal shield. Apodemes 4 extend beyond the bases of setae 3b. The adult males are smaller than females (170 µm) and the leg IV has tibia and tarsus fused. The propodosoma of male has four pairs of dorsal setae and the fourth is much shorter than the third pair and is lateral of the line forming by the first three setae (Denmark, 2000, Lindquist, 1986, Zhang, 2003).

Hosts and economic importance

This species is recognized as the cyclamen mite, but is also known as the strawberry mite because it is a major pest of this plant species (Zhang, 2003). In Africa this mite species is a pest of violet, azalea, begonia, carnation, chrysanthemums, gerbera and ivy (Jeppson et al., 1975, Zhang, 2003). *Phytonemus*

pallidus prefers feeding on upper side of young leaves or flower buds. Infested leaves are twisted, curled, distorted, brittle and reduced in size. In strawberry causes wrinkled on upper surface of leaves, irregular folding and fluting of the leaf margin; veins bulge upward like blisters (Denmark, 2000, Zhang, 2003).

Material examined

Brazil, Rio Grande do Sul. Sant'ana do Livramento: 2♂, 3♀, III.2010, in *V. vinifera*, Merlot.

***Tarsonemus confusus* Ewing, 1939**

Tarsonemus confusus Ewing, 1939: 26; Smiley 1969: 221; Kaliszewski, 1993: 40

Geographical distribution

This species is distributed in North America (USA, Canada), South America (Brasil), Europe (Turkey, Portugal, Italy, Ireland, Germany, Poland, Byelorussia, Ukraine, Russia), East Asia (Japan, Korea, China) and Africa (Egypt) (Feres et al., 2005, Santos, 2011, Zhang, 2003).

Diagnostic characteristics

The adult females are 133 - 194 µm long, body oval, about twice as long as broad, color freshly mounted specimens various shades of light yellowish brown. The sejugal apodeme is emarginated around the middle. Leg IV short, not reaching margin of body, coxa subtriangular, as broad as long, third segment longer than other segments, fourth segment short, one-fourth to one-third as long as third segment, very long apical setae, flagelliform, longer than leg IV itself. The adult males are 71- 151µm long and when freshly mounted are very light brown. Gnathosoma capsule longer than wide; stigmata not close to setae v; Metapodosomal venter with 2 pairs of setae, tegula normal its length less than 1.5 times of basal width, leg IV without flange or with broadly rounded flange; apodeme 4 not extending beyond bases of setae 3b; sejugal apodeme emarginated around the middle (Ewing, 1939, Zhang, 2003).

Hosts and economic importance

This species has been found on many plant species, in soil and litter, in house dust and

bird's nests. On ornamental plants it is known a minor pest, like in tomatoes in North America (Zhang, 2003). In Brazil it was registered on some crops (coffee, citrus, physic nut) and natural vegetation (*Lantana lilacina* Desf.) (Bobot et al., 2011, Cruz et al., 2012, Feres et al., 2005, Spongowski et al., 2008).

Material examined

Brazil, Rio Grande do Sul. Sant'Ana do Livramento: 1♂, II.2010; 3♂, 7♀, III.2010, in *V. vinifera*, Cabernet Sauvignon.

The occurrence of *T. mexicanus*, during these surveys could indicate just an occasional presence of this species. However, due to the generalist feeding habits of this species and the single register of seven mites on a single leaf indicates that there could be a real risk of establishment of populations on vineyards of Caxias do Sul, Brazil.

According to Zhang (2003) *T. confusus* occurs often associated with *P. pallidus*; these species usually diverge in their density having *T. confusus* a smaller density than *P. pallidus* and, in this case, rarely causing damages in the host plants. In the current study, the relationship between the densities of the two species was contrary to the commonly registered. The associate occurrence of these species with larger density of *T. confusus* possibly explains the expressive damages registered in the sampled vineyards. According to Denmark (2000) those mites can be transported easily by nursery plants or persons (in hands or clothes) and besides of this they can infest the plant through bad crop practices, by drafts of air or by direct contact with other infested plants.

Considering the partenogentic reproduction of these species added to very favorable conditions for its development, as found in the "Campanha" Region in Rio Grande do Sul, there is a real risk of stablishing large enough populations to cause expressive damages in the vineyards of this region. In this way, it would be important the additional studies that would deal with some aspects of the biology of these species on different grape varieties. It is also important the identification of potential natural enemies of these species for control practices to

be used in the vineyards of the region.

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