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A new species and new records of plant mites of *Bulnesia arborea* (ZYGOPHYLLACEAE) from Venezuela

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Abstract

Tetra tarabanensis **n. sp.** (Prostigmata: Eriphyidae) is described from leaf galls of *Bulnesia arborea* (Jacq.) Engl. (Zygophyllaceae). The predaceous mite (*Phytoseius woodburyi*) and the false spider mite (*Brevipalpus phoenicis*) are reported for the first time from the same host plant in Venezuela.

Key words: Eriophyidae, Phytoseiidae, plant mites, Tenuipalpidae, *Tetra tarabanensis*, "vera".

Una nueva especie y nuevos registros de ácaros de *Bulnesia arborea* (ZYGOPHYLLACEAE) en Venezuela

Resumen

Se describe a *Tetra tarabanensis* **n. sp.** (Prostigmata: Eriophyidae) colectada en agallas de *Bulnesia arborea* (Jacq.) Engl. (Zygophyllaceae). El ácaro depredador (*Phytoseius woodburyi*), y la falsa araña (*Brevipalpus phoenicis*), son registrados por primera vez sobre la misma planta hospedera en Venezuela.

Palabras clave: Ácaros fitófagos, Eriophyidae, Phytoseiidae, Tenuipalpidae, *Tetra tarabanensis,* "vera".

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INTRODUCTION

Bulnesia arborea is a South American Zygophyllaceae and a valuable timber tree in the xerophytic ecosytems of Venezuela and Colombia (Llamozas *et al*. 2003). In the former country, it is locally known as "vera" or "bera" and in the latter as "guayacan". *Bulnesia arborea* is widely distributed in northern Venezuela and currently is considered an endangered species (Llamozas *et al*. 2003) due to overexploitation for carpentry purposes. In spite of its importance, in Venezuela there are no studies about the acarofauna associated with this plant species. *Tetra tarabanensis* **n. sp.**, herein described is an eriophyid mite causing leaf protrusions containing masses of erineum which is characterized by an abnormal development of plant hairs associated with leaf bulging (Westphal and Manson 1996). The genus *Tetra* Keifer is holarctic and paleotropical in distribution and includes 87 species causing damage on 44 dicot families (Oldfield 1996, Amrine *et al.* 2003). In addition, the tenuipalpid mite, *Brevipalpus phoenicis* (Geijskes) was reported only on *Tribulus terrestris* L. (Zygophyllaceae) in North America (Childers *et al.* 2003). *Brevipalpus* species are economically important due to their capability to be vectors of plant viruses (Childers and Derrick 2003). Nevertheless, there is no information about damage caused by these two phytophagous mites on *B. arborea*. On the other hand, studies concerning Phytoseiid mites are mainly referred to species inhabiting on economically important crops, whereas information about potential biocontrol agents is very scarce on native plant hosts.

This work revealed the presence of two phytophagous mites, and a predatory mite inhabiting *B. arborea* leaves.

MATERIALS AND METHODS

Samples to identify the phytophagous and predatory mites inhabiting *Bulnesia arborea* leaves were made during January, 2005 in Rio Tocuyo (1.132.635,79 N and 394.489,14 E) and Tarabana (1.107.250,79 N and 468.824,14 E), Lara State, Venezuela (Geographical coordinates are given in UTM UGS84 GRS 80). These two localities were chosen due to the presence of natural populations. Leaves exhibiting erinea were collected and transported to the Laboratorio de Zoología Agrícola, Universidad Centroccidental Lisandro Alvarado (UCLA) and then examined for mite presence by using a stereoscopic microscope (Mod. Leica MS5). Samples were also sent to the Departamento de Entomologia, Fitopatologia e Zoologia Agrícola (Universidade de São Paulo, ESALQ) to confirm species identification. Microscope slides of all morphotypes found were prepared on Modified Berlese Medium (Amrine and Manson 1996) and examined by light microscopy.

Measurements of *Tetra tarabanensis* are given in micrometers. For females, each

measurement of the holotype precedes the corresponding range for paratypes. Some measurements could not be taken because of the mounted position.

Information about species synonymy is presented.

RESULTS

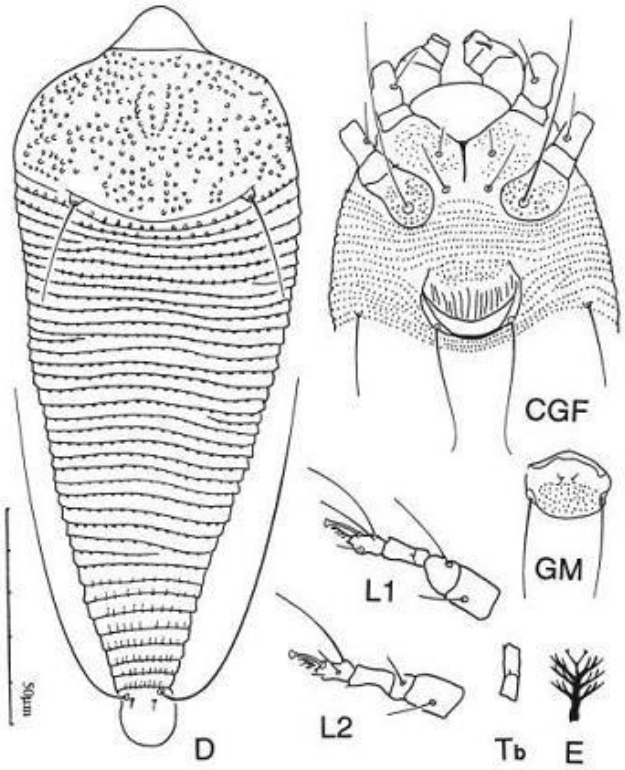
Two phytophagous and one predatory mite were collected; one of them is a new species, *Tetra tarabanensis* (Eriophyidae) herein described; and the other two records for *B. arborea*, *Brevipalpus phoenicis* (Tenuipalpidae) and *Phytoseius woodburyi* (Phytoseiidae) are new host and distribution records, respectively.

ERIOPHYIDAE

Tetra tarabanensis **n. sp.** (Fig. 1)

DIAGNOSIS

A *Tetra* species without tibial seta, but with a small spur at the transverse line at tibia dorsum. Opisthosomal dorsal annuli larger than ventral annuli.



DESCRIPTION

Holotype female (n = 6). Elongate, 147 (147-189), 56 (55-61) wide. Gnathosoma downcurved; palpgenual seta apical-lateral, somewhat around the side; basal seta 3; chelicera 23 (23-25). Prodorsal shield verrucose, 43 (41-45) including frontal lobe, 55 (51-55) wide; frontal lobe large, rounded, 10 (7-10), 18 (12-18) wide at base. Shield tubercles on rear shield margin, 35 (32-35) apart, directing scapular seta backwards; seta (*sc*) 26 (23-27). Legs missing seta on tibiae. Leg I 32 (30-32); femur 9 (9-10), femoral seta (*bv*) 10 (9-10); genu 4 (4-5), genual seta (*l"*) 16 (16-19); tibia 8 (8-10), tibial seta (*l'*) missing, with a small spur on the transverse line on tibia dorsum; tarsus 7 (5-7), dorsal seta (*ft'*) 11 (11-17), lateral seta (*ft"*) 19 (18-20), unguinal seta (*u'*) 4 (4), solenidion 6 (6-8), knobbed; empodium 5 (5-7), 4-rayed. Leg II 29 (27-31); femur 9 (9-10), *bv* 9 (9-11); genu 4 (4), *l"* 6 (6-9); tibia 6 (6-8); tarsus 6 (6-7), *ft'* 5 (4-5), *ft"* 19 (19-20), *u'* 4 (4); solenidion 7 (7); empodium 6 (6), 4-rayed. Coxigenital area: coxae granulate, with fine granules on coxae I and coarse granules on coxae II. Sternal line 8 (8-10). Coxal seta I (*1b*) 5 (5-7), 11 (10-12) apart; coxal seta II (*1a*) 11 (11-18), 8 (8) apart; coxal seta III (*2a*) 43 (43-47), 22 (22-24) apart. Coxisternal area with 9 (7-9) annuli, microtuberculate. Genitalia 19 (18-20) wide, 11 (11-16) long; genital seta (*3a*) 33 (31-42). Epigynum with ca. 4 transverse lines of microtubercles basally and 14 (14-16) longitudinal lines. Opisthosoma with a wide dorsal trough. Lateral seta (*c2*) 19 (18-19), on annulus 3 (3-4) from genital rear margin. Ventral seta I (*d*) 61 (50-63), 28 (28-35) apart, on annulus 20 (18-22); ventral seta II (*e*) 11 (8-11), 13 (13-18) apart, on annulus 38 (35-43); ventral seta III (*f*) 23 (23-27), 19 (19-23) apart, on annulus 56 (53-65) or 6 (6-7)th from rear. Total ventral annuli 61 (58-71), microtuberculate; total dorsal annuli 36 (34-45), microtuberculate. Caudal seta (*h2*) 86 (78-86); accessory seta (*h1*) 2 (2).

Male (n = 3). Smaller than female, 129-155, 49-53 wide. Gnathosoma: basal seta 3; chelicera 20-22. Prodorsal shield 37-39, including frontal lobe, 47-48 wide; frontal lobe 6-7, 14-15 wide at base; *sc* 22, 28-31 apart. Legs: leg I 27-32; femur 9-10, *bv* 10-11; genu 4-5, *l"* 16-20; tibia 7-10, *l'* missing; tarsus 5-6, *ft'* 15-17, *ft"*18-22, *u'* 4, solenidion 6-7, empodium 5-6, 4-rayed. Leg II 8-11; femur 7-10, *bv* 8-11; genu 4-5, *l"* 7-8; tibia 6-7; tarsus 5-7, *ft'* 3-6, *ft"* 16-19, *u'* 3-4, solenidion 7, empodium 6, 4-rayed. Coxigenital area: sternal line 7-9; *1b* 5-7, 9 apart; *1a* 11-16, 7-8 apart; *2a* 34-38, 21-22 apart. Coxisternal area with 6-7 annuli, microtuberculate. Genitalia granulose, 14-18 wide, 12-13 long; *3a* 24-26. Opisthosoma: *c2* 16-20, on annulus 2-3 from genitalia rear margin; *d* 49-53, 26-31 apart, on annulus 11-16; *e* 6-8, 11-14 apart, on annulus 22-32; *f* 18-25, 18-22 apart, on annulus 36-52 or 5-7th from rear. Total ventral annuli 40-58, microtuberculate; total dorsal annuli 30-42. microtuberculate; *h2* 71-81; *h1* 2.

TYPE MATERIAL

Female holotype (ESALQ Zool. 2682), 71 females and 64 male paratypes, from *Bulnesia arborea* (Jacq.) Engl. (Zygophyllaceae), "vera", Tarabana and Rio Tocuyo, Lara state, Venezuela (UTM 1107251 N, 468813 E), January 2005, col. G. Castillo, on 29 microscopic preparations, in the collection of Departamento de Entomologia, Fitopatologia e Zoologia Agrícola, Universidade de São Paulo, ESALQ, Piracicaba, São Paulo, Brazil.

Paratypes are also deposited in Laboratorio de Zoología Agrícola, Departamento de Ciencias Biológicas, Decanato de Agronomía, Universidad Centroccidental Lisandro Alvarado (UCLA), Cabudare (Palavecino county), Lara, Venezuela.

RELATION TO HOST

Erinea on lower leaf surface, which bulges protrusions on upper side.

ETYMOLOGY

The specific designation, *tarabanensis*, refers to the type locality where the mite was collected.

REMARKS

The genus *Tetra* was established by Keifer (1944) as presenting, among other morphological characters, "legs with all usual setae" and "abdomen with broad non tuberculate tergites". Although in *T. tarabanensis* **n. sp.** the tibial seta is missing, it is assigned to this genus because it has the remaining morphological characters of the genus. Also, at this point, we do not want to overburden the higher taxonomic categories in the Eriophyidae with the establishment of a new genus. Keifer (1959), in the description of *T. liriodendronis* and *T. robiniae* enlarged the definition of *Tetra* to include the presence of microtubercles on dorsal annuli.

Distribution: Tarabana, Parroquia Agua Viva, (Palavecino county) and Cerro "Las Veras", Rio Tocuyo (Torres county).

TENUIPALPIDAE

Brevipalpus phoenicis (Geijskes)

***Tenuipalpus phoenicis* Geijskes, 1939: 230.**

***Brevipalpus phoenicis* (Geijskes), Baker, 1949:360.**

The genus *Brevipalpus* is recognized as the most important group within the Tenuipalpidae (Childers *et al.* 2001). So far, a total of 486 plant species in 118 genera within 64 families, including plants of agricultural importance, various medicinal, culinary or ornamental herbs, flowering and woody ornamentals, and numerous tree species, have been reported as hosts for *B. phoenicis* (Childers *et al.* 2003). In addition to feeding damage, *Brevipalpus californicus* (Banks), *Brevipalpus obovatus* Donnadieu and *B. phoenicis* have been incriminated or proven to be vectors of one or more plant viruses classified as unassigned Rhabdoviruses in citrus, coffe, passion fruit orchids, and several woody ornamental (Childers *et al.* 2003). The plant genera that include many species serving as hosts of the *Brevipalpus* mite are *Rhus* (Anacardiaceae), *Senecio* (Compositae), *Ipomoea* (Convolvulaceae), *Clerodendron* and *Mentha* (Labiatae), *Cassia* (leguminosae), *Hibiscus* (Malvaceae), *Psidium* (Myrtaceae), *Passiflora* (Passifloraceae), *Cestrum*, *Nicotiana* and *Solanum* (Solanacaea) (Childers *et al*. 2003), Conversely, so far, just one Zygophyllaceae species had been reported as host of this tenuipalpid mite, probably due to few studies have been carried out on this plant family.

This species of false spider mite is known from other host plants from Venezuela (Doreste 1988). It is reported for the first time on *B. arborea*.

PHYTOSEIIDAE

Phytoseius woodburyi DeLeon

***Phytoseius* (*Phytoseius*) *woodburyi* DeLeon 1965: 130**

This predatory mite was described from Puerto Rico and is known to occur in Brazil, Colombia, Guadeloupe, Hawaii, Jamaica, Marie Galante, Martinique and Trinidad (Moraes *et al.* 2004). According to DeLeon (1965), *Phytoseius woodburyi* resembles *Phytoseiulus macropilis* (Banks) but differing chiefly in the relative lengths of the setae of the dorsal shield and in the size and shape of macrosetae. *P. woodburyi* seems to be related to American native plants since it has been collected from canela de Puerto Rico, *Licaria salicifolia* (Sw.) Kosterm. (=*Acrodiclidium salicifolium*), *Hibiscus* sp. (Kreiter and Moraes 1997) and from native *Solanum* species from Brazil (Rosa *et al.* 2005) and now it is reported from *B. arborea* in Venezuela. However, information about biological parameters of this predatory mite is lacking, so further research is required to understand role on dynamic populations of phytophagous mites inhabiting this plant species.

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