

Professional Plant Protection
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Acari ornamental pests in Galicia: *Tetranychidae*,
Tarsonemidae & *Eryophyidae* species identified
on woody ornamental crops.

Ácaros plaga de importancia ornamental en Galicia:
especies de *Tetranychidae*, *Tarsonemidae* & *Eryophyidae*
identificadas en cultivos de especies leñosas ornamentales

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Abstract

In the present paper the author carries out a list with the Acari species, belonging to Tetranychidae, Tarsonemidae & Eriophyidae families identified on woody ornamental crops of Galicia, as part of his independent consultancy service, carried out from 1999 to 2020. A total number of 6 different species were identified, 2 Tetranychidae, 1 Tarsonemidae and 3 Eriophyidae. Considering only crop pests, 3 of them were new references for woody ornamental crops in Galicia and 2 of them were new references for Spain.

Key words: spider mites, gall mites, broad mites, Galicia, woody ornamental crops.

Resumen

En el presente trabajo el autor relaciona la totalidad de especies de ácaros de las familias Tetranychidae, Tarsonemidae & Eriophyidae identificadas en cultivos de especies leñosas ornamentales de Galicia, basándose en la información obtenida de su trabajo como consultor entomológico independiente, desde 1999 a 2020. Se identificaron un total de 6 especies diferentes, 2 tetránquidos, 1 tarsonémido y 3 eriófidos. En condiciones de cultivo, 3 de las mismas son nuevas citas para Galicia y 2 de las mismas para España.

Palabras clave: arañas rojas, eriófidos, ácaros blancos, Galicia, cultivos de leñosas ornamentales.

1. Introduction

The list of acari species referenced, up to the present moment, as pests of woody ornamental in Spain belonging to one of the following three families, Tetranychidae, Tarsonemidae & Eriophyidae, is relatively important: *Tetranychus urticae*, *Panonychus ulmi*, *Bryobia kissophila*, *Oligonychus ununguis*, *Eryophyes campestricola*, *Tetranychus turkestani*, *Tetranychus ludeeni*, *Tetranychus neocaledonicus*, *Eotetranychus tiliarium*,

Panonychus citri, *Cenopalpus pulcher*, *Stereotarsonemus pallidus*, *Poliphagotarsonemus latus* and *Stenacis triradiatus* (Villalva, 1996, De Liñán, 1998; Ferragut & Santonja, 1989; Grupo de Trabajo de Laboratorio de Diagnóstico, 1996; Rivera Seclén, 2015).

The number of species belonging to these families and referenced on woody ornamental crops in Galicia (NW Spain) is shorter and is mainly based on the work of Mansilla and his

group: *Tetranychus urticae*, *Panonychus ulmi*, *Cosectacus cameliae*, *Calacarus carinatus*, *Acaphylla steinwedeni* and *Stigmaeopsis nanjingensis* (Mansilla 1991; Mansilla 1991 b; Mansilla *et al.*, 2003; Salinero & Vela, 2004; Andrés, 2017).

The identification of the main species of these acari families, on woody ornamental crops, is specially useful for the design of sustainable plant protection programs due to the problem of resistance to insecticides referenced, up to the present moment, on different spider mites –*Panonychus ulmi* and *Tetranychus urticae* (IRAC, 2020; IRAC, 2020 b). Their exact determination is also necessary, at the present moment, due to the increasing quarantine acari number of species for certain countries of the world.

2. Material & methods

The study was carried out only in woody ornamental production centres of Galicia, intermittently, from 1999 to 2020. The samples were obtained from 10 nurseries belonging to the following Galician provinces: 6 in Pontevedra, 3 in A Coruña and 1 in Lugo. The entomological monitoring of the pests was carried out every 15 or 30 days, sampling periodically in order to identify the acari species by means of classical entomological determination methods.

The infested plant material samples were analyzed in the entomological laboratory of the firm Consultorías Noroeste S.C. The acari extraction, mounting as well as the species determinations were performed based on the following taxonomical keys: Krantz (1970) –*Tarsonemidae*–; Gutierrez & Schicha (1983) –*Tetranychidae*– and Jeppson *et al.*, (1975) –*Eryophyidae*–.

3. Results

LIST OF IDENTIFIED ESPECIES

Family *Tetranychidae*

1. *Tetranychus urticae* C. L. Koch

Hosts: *Viburnum × pragense*, *Camellia japonica*, *Buxus sempervirens*, *Hedera helix*, *Cotoneaster lacteus*, *Picea glauca*, *Ulmus minor*, *Hibiscus rosasinensis*,

Type of crop: container and soil

Province: A Coruña & Pontevedra

2. *Stigmaeopsis nanjingensis* (Ma & Yuan)

Hosts: *Pleioblastus linearis*, *Phyllostachys aurea*, *Phyllostachys nigra*, *Phyllostachys atrovaginata*, *Sasa tsuboiana*, *Phyllostachys aureosulcata spectabilis*, *Pleioblastus linearis*.

Type of crop: container.

Province: A Coruña & Pontevedra.

Family *Eriophyidae*

3. *Eryophies lauricolus* (Nuzzazi & Volvlas)

Hosts: *Laurus nobilis*.

Type of crop: soil.

Province: Pontevedra.

4. *Aceria nervisequa* (G. Canestrini)

Hosts: *Fagus sylvatica*.

Type of crop: soil.

Province: Pontevedra.

5. *Calacarus carinatus* (Green)

Hosts: *Camellia japonica*.

Type of crop: container.

Province: Pontevedra.

Family *Tarsonemidae*

6. *Polyphagotarsonemus latus* (Banks)

Hosts: *Hosts: Castanea sativa*, *Corilus avellanae*, *Hydrangea macrophylla*, *Laurus nobilis*, *Photinia × fraserii*, *Quercus robur*.

Type of crop: container and soil.

Province: Pontevedra and Lugo.

4. Discusión

It is important to mention that both *Aceria nervisequa* and *Eryophies lauricolus* were not referenced before on woody ornamental crops neither in Galicia –NW Spain– nor in Spain. *Stigmaeopsis nanjingensis* was referenced for the first time in Galicia

and Spain on 2017 (Andrés 2017) and *Calacarus carinatus* was referenced before in Galicia but only on gardens and parks, not on container crops cultivated in nurseries (Mansilla 1991; Mansilla 1991b; Mansilla *et al.*, 2003; Andrés, 2017).

Up to the present moment there are only three species of spider mites referenced in Europe as bamboo pests: *Stigmaeopsis celarius* –referenced as pest in Holland, United Kingdom, Belgium and France (Auger & Migeon, 2007; Viebergen, 1997; Ostoja-Starzewski, 2000); *Schyzotetranychus bambusae* in France (Auger & Migeon, 2007) and *Stigmaeopsis nanjingensis* in Italy and Spain (Pellizzari & Duso, 2009; Andrés 2017).

On the present moment the complex *Schyzotetranychus celarius* is formed by seven species including *Stigmaeopsis nanjingensis*. These species are the following: *S. celarius*, *S. nanjingensis*, *S. longus*, *S. miscanthi*, *S. tenuinidis*, *S. saharai* and *S. takahashi*. All of them, with the exception of *S. miscanthi*, are exclusive pests of bamboos (Saito *et al.*, 2004).

If we considered the hosts where these species were recorded we have to mention new world references: *Picea glauca* and *Ulmus minor* for *Tetranychus urticae* as well as *Castanea sativa*, *Corylus avellanae*, *Hydrangea macrophylla*, *Laurus nobilis*, *Photinia × fraserii* and *Quercus robur* for *Polyphagotarsonemus latus*. It is important to mention that these two are the most *polyphagous acari* of all of the species included in this paper (De Liñán, 1998; CABI, 2020; CABI 2020b).

None of these species are quarantine pests in Spain. Some of these species are important quarantine pests on other parts of the world: *Tetranychus urticae* is a regulated non quarantine pest in the European Union (EPPO, 2020); *Calacarus carinatus* is considered a quarantine pest in East Africa and Southern Africa (EPPO, 2020 b) and *Polyphagotarsonemus latus* is considered quarantine pest in Mexico (EPPO, 2020 c).

Some of these species are referenced to have populations with resistance to certain groups of insecticides and acaricides. *Tetranychus urticae* has been referenced as resistant to carbamates, avermectins, organotin miticides, meti acaricides and insecticides as well as unknown or uncertain

groups –MoA groups 1A, 6, 10 A, 12 B, 20 B, 21 A and UN (IRAC, 2020 b)–. All this situation described in this paper has an important influence on the design of effective and sustainable plant protection as well as integrated pest management programs.

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TABLE 1. ACARI SPECIES OF THE FAMILIES TETRANYCHIDAE, TARSONEMIDAE & ERYOPHYIDAE IDENTIFIED ON WOODY ORNAMENTAL CROPS IN GALICIA FROM 1999 TO 2020 AND ITS REFERENCES WORLDWIDE

Identified species	Cited in Galicia on ornamental	Cited in Spain on ornamental crops	Observations
<i>Tetranychus urticae</i>	Salinero & Vela, 2004	De Liñan, 1998	Polyphagous pest
<i>Calacarus carinatus</i>	Mansilla, 1991	Mansilla, 1991	Referenced in Galicia
<i>Eryophies lauricolus</i>	No references	No references	Not present
<i>Aceria nervisequa</i>	No references	No references	PESI, 2020.
<i>Stigmaeopsis nanjingensis</i>	Andrés, 2017	Andrés, 2017	Not present
<i>Polyphagotarsonemus latus</i>	No references	De Liñan, 1998	PESI, 2020.

TABLE 2. HOSTS AND STATUS OF THE ACARI SPECIES BELONGING TO THE FAMILIES TETRANYCHIDAE, TARSONEMIDAE & ERYOPHYIDAE IDENTIFIED ON WOODY ORNAMENTAL CROPS IN GALICIA FROM 1999 TO 2020 AND ITS REFERENCES WORLDWIDE.

Identified species	Cited in Galicia on ornamental	Cited in Spain on ornamental crops
<i>Tetranychus urticae</i>	<i>Viburnum × pragense</i>	Rivera Seclén, 2015
	<i>Camellia japonica</i>	CABI, 2020
	<i>Buxus sempervirens</i>	No reference
	<i>Hedera helix</i>	CABI, 2020
	<i>Cotoneaster lacteus</i>	No reference
	<i>Picea glauca</i>	No reference
	<i>Ulmus minor</i>	No reference
	<i>Hibiscus rosa-sinensis</i>	Rivera Seclén, 2015
<i>Stigmaeopsis nanjingensis</i>	<i>Pleioblastus linearis</i>	Andrés, 2017
	<i>Phyllostachys aurea</i>	Kontschan, Nemeyeri, 2013
	<i>Phyllostachys nigra</i>	Pellizari & Duso, 2009
	<i>Phyllostachys atrovaginata</i>	Andrés, 2017
	<i>Sasa tsuboiana</i>	Andrés, 2017
	<i>Phyllostachys aureosulcata spectabilis</i>	Andrés, 2017
<i>Eryophies lauricolus</i>	<i>Laurus nobilis</i>	CAB 2020
<i>Aceria nervisequa</i>	<i>Fagus silvatica</i>	Alford, 1995
<i>Calacarus carinatus</i>	<i>Camellia japonica</i>	Mansilla, 1991
<i>Polyphagotarsonemus latus</i>	<i>Castanea sativa</i>	No reference
	<i>Corylus avellanae</i>	No reference
	<i>Hydrangea macrophylla</i>	No reference
	<i>Laurus nobilis</i>	No reference
	<i>Photinia × fraserii</i>	No reference
	<i>Quercus robur</i>	No reference