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A preliminary survey of the spider mites (Acari: Tetranychidae) in Latakia governorate of Syria

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ABSTRACT — This paper reports ten tetranychid mites species on several cultivated and uncultivated plants in Latakia governorate (Syria) in 2011-2012. Three species belong to the subfamily Bryobiinae and to the genera *Aplonobia*, *Bryobia* and *Petrobia*, while seven species belong to the subfamily Tetranychinae and to the genera *Eotetranychus*, *Eutetranychus*, *Panonychus* and *Tetranychus*. Nine of the mite species identified in this study are reported for the first time from Syria, while one species had already been previously reported. This paper gives information concerning locations, host plants and distribution of each collected species.

KEYWORDS — Tetranychidae; host plants; new records; Syria

INTRODUCTION

The family Tetranychidae Donnadieu is one of the most cosmopolitan and economically important families of the Acari (Bolland *et al*. 1998). It comprises 1,250 phytophagous species (Migeon and Dorkeld 2006-2013). Among them, more than 100 can be considered as pests and 10 as major pests of agricultural crops all over the world. In Syria, this family is poorly investigated despite the economic damages that theses mites can cause to different agricultural crops. The European red mite *Panonychus ulmi* (Koch) is the only species reported from this country in the world tetranychid catalog (Bolland *et al*. 1998) and in the Spider Mites Web database (Migeon and Dorkeld 2006-2013).

The knowledge of faunistic composition in a region is the first step in the establishment of effective control strategies. Thus the aim of this study was to identify tetranychid mites associated with several cultivated plants and natural vegetation covering different localities in the Latakia Governorate of Syria.

MATERIALS AND METHODS

A survey of tetranychid mites was carried out from 27 September 2011 to 22 July 2012, in 41 localities in Latakia governorate in both cultivated fields and natural vegetation. Mites were directly collected from leaves and temporarily preserved in 70 % ethanol. Mites intact were mounted on slides in Hoyer's medium. The specimens were examined under a phase-contrast microscope (Nikon Eclipse E200).

Identification of mites to the genus level was made using the key to the spider mite genera of the world (Bolland *et al*., 1998). For species identification, all available published literature of tetranychid mites species description was used (e.g. Pritchard and Baker 1955; Baker and Pritchard 1960; Jeppson *et al*. 1975; Gutierrez and Helle 1983; Gutierrez and Schicha 1983; Meyer 1987; Ochoa *et al*. 1994; Ehara 1999; Flechtmann and Knihinicki 2002; Zhang *et al*. 2002; Auger *et al*. 2003; Zhang 2003; Toroitich *et al*. 2009; Vacante 2010; Seeman and Beard 2011). The terminology used for the body setation is according to Lindquist (1985). World distribution of each species and host range are according to Migeon and Dorkeld (2006-2013). The specimens were deposited in the Arthropod Collection of the Department of Plant Protection, Faculty of Agriculture, Tishreen University, Latakia, Syria.

Results and discussion

Subfamily Bryobiinae Berlese
Genus *Bryobia* Koch

Bryobia vasiljevi Reck, 1953

Bryobia vasiljevi Reck, 1953
Bryobia repensi Manson, 1967

It occurs on herbage, apple and strawberries (Jeppson *et al*. 1975). The mite feeds mainly on the upper leaf surface and may cause severe bleaching of the blade. The development of heavy infestations appears to be favored by extremely dry weather (Gutierrez and Schicha 1983).

Specimens examined — 8 ♀♀ and 2 larvae on *Trifolium* sp. (Leguminosae), 3 ♀♀ and 1 larva on *Taraxacum campylodes* (Asteraceae), Latakia city (35°31′17.38"N, 35°46′29.40"E), 23-IV-2012.

World distribution and remarks — This species was recorded in New Zealand, Australia, Chile and many countries in Europe (Gutierrez and Schicha 1983; Migeon and Dorkeld, 2006-2013) but not in Syria. This is the first report of *B. vasiljevi* in the Middle East.

Genus *Petrobia* Ewing 1909

Petrobia (Tetranychina) harti (Ewing, 1909)

This species occurs on a wide range of host plants. The genus *Oxalis* is considered as its major host plant (Jeppson *et al*. 1975; Ehara 1999; Migeon and Dorkeld 2006-2013). In the field, the injury of this mite appears as fine silver stipples on leaves. It prefers the underside of leaves (Ochoa *et al.* 1994).

Specimens examined — 10 ♀♀ and 5 ♂♂ on *Oxalis corniculata* (Oxalidaceae), Jableh (35°36′08.72"N, 35°92′57.31"E), 27-IX-2011; 10 ♀♀ and 2 ♂♂ on *O. corniculata*, Al-Hennadi (35°29′18.28"N, 35°51′48.01"E), 19-X-2011; 8 ♀♀ and 2 ♂♂ on *O. corniculata*, Al-Sanobar (35°29′9.16"N, 35°52′7.07"E), 15-IV-2012; 8 ♀♀ and 2 ♂♂ on *Oxalis stricta*, Zeghren (35°42′35.90"N, 35°52′46.5"E), 5-X-2011.

World distribution and remarks — This mite has a worldwide distribution and occurs on wide range of plants. In the Middle East, this species is recorded in many countries and the earliest report was from Egypt by Sayed (1946), (*In* Migeon and Dorkeld 2006-2013).

Genus *Aplonobia* Womersly 1940

Aplonobia histricina (Berlese, 1910)

Oxalis pes-caprae is the main plant host of this tetranychid mite but it was also collected on fruit trees in South Australia, New South Wales and South Africa (Gutierrez and Schicha 1983; Migeon and Dorkeld 2006-2013).

Specimens examined — 10 ♀♀ on *O. pes-caprae* (Oxalidaceae), Latakia city (35°35′4.35"N, 35°44′49.86"E), 28-X-2011; 10 ♀♀ on *O. pes-caprae*, Al-Sanobar (35°28′48.44"N, 35°51′35.66"E), 27-III-2011.

Remarks — This species is known from South Africa, Australia and Italy, and infests pear *Pyrus communis* (Rosaceae), *Sphaeralcea ambigua* (Malvaceae) and *Oxalis* spp. (Oxalidaceae) The mite also occurs sporadically on citrus trees. It oversummers as eggs, and resumes development in the autumn (Vacante, 2010). It has been collected in Israel on *O. pes-capreae* (Migeon and Dorkeld 2006-2013). Males are unknown (Gutierrez and Schicha 1983) and females are relatively of a big size 900 – 1050 μm.

Subfamily Tetranychidae Berlese
Genus *Eutetranychus* Bank 1917

Eutetranychus orientalis (Klein, 1936)

The oriental red mite *Eutetranychus orientalis* is considered as a major pest of citrus in the Afrotropical, Australasian and Palearctic regions (Meyer 1987; Ferragut *et al.* 2012). It has also been reported on members of other host families in many countries (Migeon and Dorkeld 2006-2013)

Specimens examined — 10 ♀♀ and 8 ♂♂ on *Plumeria alba* (Apocynaceae), Raas Iben-Hani (35°35′48.96"N, 35°45′42.93"E), 17-VII-2011; 8 ♀♀ and 6 ♂♂ on *P. alba*, Latakia city (35°31′47.27"N, 35°48′23.68"E), 29-IX-2011; 10 ♀♀, 8 ♂♂ *P. alba*, Jableh (35°22′11.45"N, 35°55′28.32"E), 3-X-2011; 10 ♀♀ and 8 ♂♂ on *Citrus limon* (Rutaceae), Al-Sakhabeh (35°18′47.34"N, 36°1′36.44"E), 28-IX-2011; 8 ♀♀ and 6 ♂♂ on *C. limon*, Latakia city (35°31′48.60"N, 35°48′22.68"E), 5-X-2011; 8 ♀♀ and 8 ♂♂ on *C. limon*, Latakia city (35°31′43.51"N, 35°47′18.12"E), 13-X-2011; 8 ♀♀ and 7 ♂♂ on *C. limon*, Hai Alarabi (35°30′29.70"N, 35°49′5.56"E), 10-XI-2011; 8 ♀♀ and 6 ♂♂ on *C. limon*, Al Morouj (35°34′47.64"N, 35°45′30.23"E), 17-XI-2011; 8 ♀♀ and 8 ♂♂ on *Melia azedarach* (Meliaceae), Al-Farous (35°31′43.40"N, 35°47′18.03"E), 7-X-2011; 8 ♀♀ and 8 ♂♂ on *M. azedarach*, Latakia city (35°31′18.20"N, 35°46′46.30"E), 8-X-2011; 8 ♀♀ and 8 ♂♂ on *Juglans regia* (Juglandaceae), Latakia city (35°31′43.40"N, 35°47′18.03"E), 7-X-2011; 8 ♀♀ and 8 ♂♂ on *Ricinus communis* (Euphorbiaceae), Latakia city (35°31′58.11"N, 35°46′39.82"E), 8-X-2011.

World distribution and Remarks — *Eutetranychus orientalis* has a worldwide distribution (Bolland *et al*. 1998; Vacante 2010). It was reported before this survey on several plant species in many countries neighboring Syria as Jordan, Turkey and Cyprus (Migeon and Dorkeld 2006-2013).

Genus *Eotetranychus* Oudemans 1931

Eotetranychus rubiphilus (Reck, 1948)

This species occurs on many plant species belonging to Rosaceae, especially *Rubus* sp. but it has also been recorded on *Vitis* sp. and *Vitis vinifera.*

Specimens examined — 20 ♀♀ and 20 ♂♂ *Rubus* sp. (Rosaceae), Latakia, Al Qanjara (35°34′43.70"N, 35°48′29.68"E), 13-IV-2012.

World distribution and Remarks — It has been reported from Europe and Asia (Gutierrez and Helle 1983; Migeon *et al.*, 2007; Migeon and Dorkeld 2006-2013). This is the first report of this species in the Middle East.

Genus *Panonychus* Yokoyama 1929

Panonychus citri (McGregor, 1916)

The citrus red mite *Panonychus citri* is a major pest of the world citrus causing serious damages (Vacante 2010), especially after using the broad-spectrum pesticides which killed its natural enemies (Kasap 2009). Latakia is the main citrus growing region of Syria and this species is one of the major pest in citrus orchard in this governorate.

Specimens examined — 8 ♀♀ and 1♂ on *C. limon* (Rutaceae), Al Qanjara (35°34′43.68"N, 35°48′29.63"E), 30-IX-2011; 1♀ and 4 ♂♂ on *C. limon*, Al shameea (35°38′12.53"N, 35°48′26.88"E), 13-X-2011; 8 ♀♀ and 4 ♂♂ on *C. limon*, Janata (35°35′3.18"N, 35°50′1.79"E), 7-XI-2011; 10 ♀♀ and 4 ♂♂ on *C. reticulata var. clementine*, Al Herajia (35°44′18.73"N, 35°52′57.55"E), 5-X-2011; 8 ♀♀ and 3 ♂♂ on *C. reticulata*, Al Hannadi (35°29′53.10"N, 35°52′36.50"E), 14-IV-2012.

World distribution and Remarks — *Panonychus citri* has a worldwide distribution and was reported in many countries neighboring Syria (Bolland *et al*. 1998; Migeon and Dorkeld 2006-2013) before this study.

Panonychus ulmi (Koch, 1836)

The European red mite *Panonychus ulmi* has a wide range of hosts; it has been reported on 140 plant hosts (Bolland *et al*. 1998; Migeon and Dorkeld 2006-2013). Eggs are slightly flattened dorsally striated in a radial form, red with a dorsal stripe. It is a major pest of apple over the world as a result of moving with saplings (Jeppson *et al*. 1975; Ochoa *et al*. 1994).

Specimens examined — 10 ♀♀ and 10 ♂♂ on *Malus domestica* (Rosaceae), Eramo (35°37′50.50"N, 36°8′30.17"E), 21-IV-2012.

World distribution and Remarks — *Panonychus ulmi* has a worldwide occurrence, and was previously reported from Syria by Kady (1965). This species is a major pest in different apple growing regions of Syria.

Genus *Tetranychus* Dufour 1832

Tetranychus evansi Baker & Pritchard, 1960

The red tomato spider mite *Tetranychus evansi* was first reported from north-east Brazil in 1952 (Silva 1954), from where the species probably originated (Boubou *et al.* 2011, Boubou *et al.* 2012). This mite has recently emerged as a new threat to solanaceous crops in Africa and Mediterranean basin, with invasions characterized by a high reproductive output and an ability to withstand a wide range of temperatures (Bonato 1999, Boubou *et al*. 2011, Migeon *et al.* 2015).

Specimens examined — 10 ♀♀ and 10 ♂♂ on *Solanum lycopersicum* (Solanaceae), Al Hannadi (35°29′19.15"N, 35°51′45.06"E), 29-IX-2011; 10 ♀♀ and 10 ♂♂ on *Solanum nigrum*, Karsana (35°36′31.90"N, 35°49′6.27"E), 5-X-2011; 10 ♀♀ and 10 ♂♂ on *S. nigrum*, Arab al-Melk (35°15′54.18"N, 35°55′38.16"E), 22-X-2011.; 10 ♀♀ and 10 ♂♂ on *Solanum* sp., Al Herajiia (35°44′18.63"N, 35°52′58.63"E), 5-X-2011.

Remarks — Latakia is one of the main solanaceous crops growing regions of Syria and this mite represents certainly a real menace for agriculture in this region.

Tetranychus turkestani (Ugarov and Nikolski, 1937)

The color of the summer adult female of that species is variable but is often yellow-green. A large spot is always present on each side, beginning just behind the eye spots and extending beyond the middle of the body, with an occasional additional pair of posterior spots, one on each side toward the end of the hysterosoma (Jeppson *et al.* 1975; Seeman and Beard 2011). *Tetranychus turkestani* and *T. urticae* are very similar and without microscopic examination of the male aedeagus it is impossible to separate between them (Migeon 2005). In our collection, this species was found together with *T. urticae* on some sample (*Trifolium* sp, *Tribulus terrestis* and *Ailanthus altissima*). It is a serious pest of many crops throughout the world, mainly low-growing crops and has been recorded from 270 host plants over the world (Jeppson e*t al*. 1975; Migeon and Dorkeld 2006-2013).

Specimens examined — 10 ♀♀ and 10 ♂♂ on *Solanum melongena* (Solanaceae), Shalfatea (35°32′5.84"N, 35°53′56.15"E), 28-IX-2011; 10 ♀♀ and 8 ♂♂ on *Malva* sp. (Malvaceae), Latakia city (35°32′28.42"N, 35°46′37.17"E) 7-X-2011; 10 ♀♀ and 8 ♂♂ on *Malva* sp. (Malvaceae), Latakia city (35°30′54.21"N, 35°46′17.91"E) 8-X-2011; 10 ♀♀ and 8 ♂♂ on *Malva* sp., Latakia city (35°32′30.63"N, 35°47′57.30"E) 12-XI-2011; 10 ♀♀ and 5 ♂♂ on *T. terrestris* (Zygophyllaceae), Latakia city (35°30′54.21"N, 35°46′17.91"E) 8-X-2011; 10 ♀♀ and 8 ♂♂ on *A. altissima* (Simaroubaceae), Latakia city (35°30′54.21"N, 35°46′17.91"E), 8-X-2011; 8 ♀♀ and 8 ♂♂ on *Fraxinus* sp. (Oleaceae), Latakia city (35°31′30.09"N, 35°47′34.90"E), 13-X-2011; 8 ♀♀ and 8 ♂♂ on *Dianthus* sp. (Caryophyllaceae), Al Hannadi (35°29′19.02"N, 35°51′41.14"E), 21-IV-2012; 8 ♀♀ and 8 ♂♂ on *Trifolium* sp. (Leguminosae) Latakia city (35°31′36.05"N, 35°48′21.44"E), 23-IV-2012; 8 ♀♀ and 8 ♂♂ on *Melia azedarach* (Meliaceae), Latakia city (35°31′26.01"N, 35°47′51.22"E), 24-IV-2012; 8 ♀♀ and 8 ♂♂ on *M. azedarach*, Latakia city (35°31′37.02"N, 35°47′24.87"E), 15-VI-2012; 8 ♀♀ and 8 ♂♂ on *Mentha* sp. (Lamiaceae), Fedeo (35°31′1.80"N, 35°53′24.44"E), 30-V-2012; 8 ♀♀ and 4 ♂♂ on *Rosa* sp. (Rosaceae), Latakia city (35°31′41.36"N, 35°47′36.90"E), 1-VI-2012; 8 ♀♀ and 8 ♂♂ on *Juglans regia* (Juglandaceae), Beshraghi (35°17′52.47"N, 36°5′54.75"E), 21-VII-2012; 10 ♀♀ and 10 ♂♂ on *M. domestica* (Rosaceae), Beshraghi (35°37′49.03"N, 36° 8′13.32"E), 21-VII-2012; 10 ♀♀ and 4 ♂♂ on *Phaseolus vulgaris* (Leguminosae), Al Brazeen (35°15′14.04"N, 36° 1′23.12"E), 22-VII-2012.

Remarks — *Tetranychus turkestani* is a worldwide distributed species and was reported before this study from many countries in the Middle East.

Tetranychus urticae Koch 1836

The two-spotted spider mite *Tetranychus urticae*, an ubiquitous species, is considered as one of the main

phytophagous mites (Helle and Sabelis 1985). This species is the most polyphagous species of spider mites and the most economically injurious. It attacks around 1,094 plant species in 109 countries around the world. Among the 19 most important agricultural crops in the world, six (citrus, cotton, grapes, apples, beans, and papaya) were reported as being hosts of the two-spotted spider mite (Yaninek and Moraes 1991; Marčić *et al*. 2009).

Specimens examined — 10 ♀♀ and 8 ♂♂ on *Ricinus communis* (Euphorbiaceae), Latakia city (35°31′16.33"N, 35°48′26.72"E), 27-IX-2011; 10 ♀♀ and 6 ♂♂ on *R. communis*, Al Olaemeea (35°38′3.40"N, 35°49′52.67"E), 5-X-2011; 10 ♀♀ and 8 ♂♂ on *S. nigrum* (Solanaceae), Qanjaraa (35°34′34.15"N, 35°49′4.97"E), 30-IX-2011; 10 ♀♀ and 8 ♂♂ on *S. nigrum*, Janata (35°35′5.57"N, 35°50′3.18"E), 14-X-2011; 10 ♀♀ and 8 ♂♂ on *S. melongena,* Al Bassa (35°29′55.60"N, 35°50′43.28"E), 20-X-2011; 8 ♀♀ and 8 ♂♂ on *S. melongena*, Al Qanjara (35°34′55.41"N, 35°48′43.91"E), 7-XI-2011; 10 ♀♀ and 8 ♂♂ on *Ipomoea* sp. (Convolvulaceae), Al Qanjaraa (35°34′45.68"N, 35°48′27.42"E), 30-IX-2011; 10 ♀♀ and 8 ♂♂ on *Morus alba* (Moraceae), Al Qanjaraa (35°34′44.73"N, 35°48′23.63"E), 30-IX-2011; 10 ♀♀ and 8 ♂♂ on *M. alba*, Wadi Qandil (35°42′36.78"N, 35°52′47.97"E), 5-X-2011; 10 ♀♀ and 6 ♂♂ on *Amaranthus retroflexus* (Amaranthaceae), Al Herajia (35°44′17.81"N, 35°52′59.79"E), 5-X-2011; 10 ♀♀ and 6 ♂♂ on *A. retroflexus*, Al Brazeen (35°15′12.33"N, 36°01′21.36"E), 22-VII-2012; 8 ♀♀ and 10 ♂♂ on *T. terrestis* (Zygophyllaceae), Latakia city (35°30′54.19"N, 35°46′17.89"E), 8-X-2011; 8 ♀♀ and 8 ♂♂ on *S. lycopersicum* (Solanaceae), Al Rahbea (35°16′50.38"N, 35°59′13.08"E), 10-X-2011; 10 ♀♀ and 8 ♂♂ on *S. lycopersicum*, Latakia Janata (35°34′58.51"N, 35°49′48.25"E), 14-X-2011; 10 ♀♀ and 8 ♂♂ on *S. lycopersicum*, Beshraghe (35°17′58.54"N, 36°5′50.49"E), 5-VI-2012; 8 ♀♀ and 8 ♂♂ on *Ziziphus jujuba* (Rhamnaceae), Al Mzeraa (35°29′26.57"N, 35°53′32.26"E), 11-X-2011; 8 ♀♀ and 8 ♂♂ on *Prunus persica* (Rosaceae), Al Qanjara (35°34′51.68"N, 35°48′45.02"E), 13-X-2011; 10 ♀♀ and 10 ♂♂ on *Prunus armeniaca*, Latakia city (35°31′37.68"N, 35°47′29.55"E), 19-X-2011; 10 ♀♀ and 8 ♂♂ on *Urtica* sp. (Urticaceae) Janata (35°35′2.35"N, 35°50′7.26"E), 14-X-2011; 10 ♀♀ and 8 ♂♂ on *Urtica* sp., Al Herajea (35°44′22.77"N, 35°52′58.05"E), 15-X-2011; 10 ♀♀ and 7 ♂♂ on *Polygonum convolvulus* (Polygonaceae), Janata (35°34′45.97"N, 35°49′38.11"E), 14-X-2011; 10 ♀♀ and 8 ♂♂ on *Cucumis sativus* (Cucurbitaceae), Al Berjan (35°17′42.09"N, 35°58′56.37"E), 17-X-2011; 10 ♀♀ and 8 ♂♂ on *Chenopodium album* (Chenopodiaceae), Latakia city (35°31′28.92"N, 35°47′44.14"E), 19-X-2011; 8 ♀♀ and 6 ♂♂ on *Malva* sp. (Malvaceae), Al Shamea (35°38′6.34"N, 35°48′17.74"E), 6-IV-2012; 8 ♀♀ and 6 ♂♂ on *Malva sp*, Al Hanadi (35°29′47.37"N, 35°51′56.74"E), 7-IV-2012; 10 ♀♀ and 5 ♂♂ on *Melilotus* sp. (Leguminosae), Al Bassa (35°29′55.91"N, 35°50′32.71"E), 23-IV-2012; 8 ♀♀ and 7 ♂♂ on *Sonchus oleraceus* (Asteraceae), Latakia city (35°31′31.95"N, 35°47′27.30"E), 24-X-2012; 10 ♀♀ and 8 ♂♂ on *P. vulgaris* (Leguminosae), Hai Alarabi (35°30′29.74"N, 35°49′5.54"E), 17-VI-2012.

Remarks — *Tetranychus urticae* has a world distribution (109 countries around the world) and was reported before this study from many countries neighboring Syria (Migeon and Dorkeld 2006-2013). In Syria, this species is a key pest in horticultural crops (outdoors and greenhouses). In this study, it was the dominant species and was found in all sites considered. Two forms of this species can be recognized by their green or red body color (Auger *et al.* 2013), the red form is dominant in our region and in addition, these two forms of that species were found together in the same population.

Conclusion

This paper is the first report of tetranychid mites from Syria. Ten tetranychid species belonging to seven genera are reported in the present study. These mites were identified on 83 samples from different localities from Latakia governorate. Four samples contained more than one species of tetranychids on the same leaf. This occurred on *Trifolium* sp. (*T. urticae* and *T. turkestani*); on *A. altissima* (*T. urticae* and *T. turkestani*); on *Malva* sp. (*T. turkestani* and *B. vasiljevi*); on *T. terrestris* (*T. urticae* and *T. turkestani*). This study is the first step in a long way to identify phytophagous and predatory

mites in Latakia governorate and in the rest of the country.

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References

Auger P., Migeon A., Flechtmann C.H.W. 2003 — A new species of *Eotetranychus* from France (Acari, Prostigmata: Tetranychidae) — Zootaxa, 206: 1-7.

Auger P., Migeon A., Ueckermann E.A., Tiedt L. Navajas M. 2013 — Evidence for synonymy between *Tetranychus urticae* and *Tetranychus cinnabarinus* (Acari, Prostigmata, Tetranychidae): Review and new data — Acarologia, 53(4): 383-415. doi:10.1051/acarologia/20132102

Baker E.W., Pritchard A.E. 1960 — The Tetranychoid mites of Africa — Hiligardia 29(11): 455-574.

Bolland H.R., Gutierrez J., Flechtmann, C.H.W. 1998 — World catalogue of the spider mite family (Acari: Tetranychidae) — Leiden: Brill Academic Publishers, 392 pp.

Bonato O. 1999 — The effect of temperature on life history parameters of *Tetranychus evansi* (Acari: Tetranychidae) — Exp. Appl. Acarol., 23: 11-19. doi:10.1023/A:1006144610009

Boubou A., Migeon A., Roderick G.K., Navajas M. 2011 — Recent emergence and worldwide spread of the red tomato spider mite, *Tetranychus evansi*: genetic variation and multiple cryptic invasions — Biol. Invasions, 13: 81-92. doi:10.1007/s10530-010-9791-y

Boubou A., Migeon A., Roderick G.K., Auger P., Cornuet J.-M., Magalhães S., Navajas M. 2012 — Test of colonisation scenarios reveals complex invasion history of the red tomato spider mite *Tetranychus evansi* — Plos One, 7(4): e35601. doi:10.1371/journal.pone.0035601

Ehara S. 1999 — Revision of the Spider Mite Family Tetranychidae of Japan (Acari: Prostigmata) — Species Diversity, 4: 63-141.

Ferragut F., Navia D., Ochoa R. 2012 — New mite invasions in citrus in the early years of the 21st century — Exp. Appl. Acarol., 59: 145-164. doi:10.1007/s10493-012-9635-9

Flechtmann C.H.W., Knihinicki D.K. 2002 — New species and new record of *Tetranychus* Dufour from Australia, with a key to the major groups in this genus based on females — Aust. Entomol., 41: 118-127. doi:10.1046/j.1440-6055.2002.00289.x

Gutierrez J., Helle W. 1983 — *Eotetranychus rubiphilus*, espèce nouvelle pour la France et l'Europe occidentale: re-description et caryotype (Acari: Tetranychidae) — Entomol. Ber., 43(7): 109-112.

Gutierrez J., Schicha E. 1983 — The spider mite family Tetranychidae (Acari) in New South Wales — Int. J. Acarol., 9: 99-116. doi:10.1080/01647958308683322

Jeppson L.R., Keifer H.H., Barker E.W. 1975 — Mites injurious to economic plants — Berkeley: University of California Press. 614 pp.

Kady M. 1965 — Control of winter eggs of *Panonychus ulmi* Koch on imported apple fruits (Acarina) — Bull. Soc. Entomol. Egypte, 48: 1-3.

Kasap, I. 2009 — The biology and fecundity of citrus red mite, *Panonychus citri* (McGregor) (Acarina: Tetranychidae) at different temperatures under laboratory conditions — Turkish J. Agric., 33: 593-600.

Lindquist E.E. 1985 — Anatomy, phylogeny and systematics: External anatomy: 3-28. In: Helle W. and Sabelis M.W (eds): Spider mites: their biology, natural enemies and control — Amsterdam: Elsevier. 1A., 405 pp.

Marčić D., Ogurlić I., Perić P. 2009 — Effects of spirodiclofen on the reproductive potential of two-spotted spider mite (Acari: Tetranychidae) ovipositing females — Arch. Biol. Sci., Belgrade, 61(4): 777-785.

Meyer M.K.P. 1987 — African Tetranychidae (Acari: Prostigmata); with reference to the world genera — Pretoria: Republic of South Africa Department of Agriculture and Water Supply. Entomology Memoir No. 69, 175 pp.

Migeon A. 2005 — Un nouvel acarien ravageur en France: *Tetranychus evansi* Baker et Pritchard — Phytoma – La Défense des Végétaux, 579: 38-43

Migeon A., Auger P., Hufbauer R., Navajas M. 2012 — Genetic traits leading to invasion: plasticity in cold hardiness explains current distribution of an invasive agricultural pest, *Tetranychus evansi* (Acari: Tetranychidae) — Biol. Invasions, 17: 2275-2285. doi:10.1007/s10530-015-0873-8

Migeon A., Dorkeld F. 2006-2013 — Spider Mites Web: a comprehensive database for the Tetranychidae. http://www.montpellier.inra.fr/CBGP/spmweb. Last accessed on May 2013.

Migeon A., Malagnini V., Navajas M., Duso C. 2007 — Notes on the genus *Eotetranychus* (Acari: Tetranychidae) in Italy and France with a redescription of *Eotetranychus fraxini* Reck, new record for Italy and Western Europe — Zootaxa 1509: 51-60.

Ochoa R., Aguilar H., Vargas C. 1994 — Phytophagous mites of Central America: An illustrated guide — Turrialba: CATIE. Serie Tecnica, Manual Tecnico No. 6 Eng. ed., 234 pp.

Pritchard A.E., Baker E.W. 1955 — A revision of the spider mite family Tetranychidae — San Francisco: Pacific Coast Eantomological Society, Memoirs series, 2, 472 pp.

Seeman O.D., Beard J.J. 2011 — Identification of exotic pest and Australian native and naturalised species of *Tetranychu*s (Acari: Tetranychidae) — Zootaxa, 2961: 1-72.

Silva P. 1954 — Um novo àcaro nocivo ao tomateiro na Bahia — Boletim do Instituto Biologica da Bahia 1: 1-20.

Toroitich F.J., Ueckermann E.A., Theron P.D., Knapp M. 2009 — The tetranychid mites (Acari: Tetranychidae) of Kenya and a redescription of the species *Peltanobia erasmusi* Meyer (Acari: Tetranychidae) based on males — Zootaxa, 2176: 33-47

Vacante V. 2010 — Citrus mites identification, bionomy and control — Wallingford: CABI Publishing. 378 pp.

Yaninek J.S., Moraes G. J., 1991 — A synopsis of classical biological control of mites in agriculture. In: F. Dusabeck, V. Bukva (Eds). Modern Acarology — The Hague: Academia, SPB Academic Publication, 1: 133-149.

Zhang Z.Q. 2003 — Mites of greenhouses: Identification, biology and control — Wallingford: CABI Publisheing, 244 pp.

Zhang Z.Q., Henderson R., Flynn A., Martin N. 2002 — Key to Tetranychidae of New Zealand — MAF Science Policy, Project FMA 180. 63 pp.

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