

SPIDER MITES (*TETRANYCHIDAE*) RECORDED ON ORNAMENTAL TREES AND SHRUBS IN NURSERIES

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Abstract: This paper presents the results of observations on occurrence of *Tetranychidae*. During 1995–2001 investigations a total of 10 species, namely *Bryobia praetiosa*, *Eotetranychus carpini*, *E. coryli*, *E. pruni*, *E. tiliarum*, *Eurytetranychus buxi*, *Panonychus ulmi*, *Schizotetranychus schizopus*, *Tetranychus viennensis* and *T. urticae* were collected in ornamental nurseries in Poland. The *T. urticae* was the most frequent species of mites and it was found on 60 different species of plants belonging to 17 families. This species caused severe damage on *Spiraea japonica* (*Rosaceae*), *Ulmus minor* 'Jacqueline Hillier' (*Ulmaceae*), *Magnolia* spp. (*Magnoliaceae*), *Buddleja davidii* (*Buddlejaceae*), *Sambucus nigra* (*Caprifoliaceae*), *Laburnum xwatererii* (*Fabaceae*) and *Daphne mezereum* (*Thymelaeaceae*). Among other tetranychids, *S. schizopus* is also dangerous pest of grafted willows.

Key words: ornamental, crops, nurseries, tetranychids

INTRODUCTION

Up to the present, 23 species of spider mites are known to occur on trees and shrubs in Poland (Kropczyńska 1999). There are many references to spider mites as fruit pests (Dąbrowski and Rejman 1975; Łabanowska et al. 1975/1976; Łabanowska and Rechnio 1975–1976; Skorupska 1976; 1883; Warabieda and Olszak 1995). Information about the damage, biology and control of tetranychids on ornamental trees and shrubs are referred to linden (Czajkowska 1998; 1999; Kropczyńska and Czajkowska 1995; Kropczyńska et al. 1998), coniferous plants (Bogatko and Łabanowski 1986; Czajkowska et al. 2001) and cultivated boxwood (Łabanowski 1983).

This paper presents the review of spider mites collected from ornamental trees and shrubs in commercial nurseries.

MATERIAL AND METHODS

The observations were carried out in 1995–2001 in 37 commercial nurseries situated in different parts of Poland. The infested shoots and leaves were sampled

from May to September. All stages of mites were collected and mounted in Hoyer or Heinze medium. The spider mites were identified according to Kropczyńska's (1999) and Pritchard and Baker's (1955) keys.

RESULTS AND DISCUSSION

The observations revealed the presence of 10 tetranychid species living on ornamental trees and shrubs and 9 of them were collected from plants cultivated in nurseries (Tabs. 1, 2).

Bryobiini

1. *Bryobia praetiosa* (Koch, 1836) was collected from *Cytisus* 'Hollandia' (Jasieniec, 19.07.1997). No damage was observed. Probably *Cytisus* spp. is not susceptible to this mite. This species was recorded several times in Poland, but mainly as a fruit pest in neglected fruit orchards. It was also found on *Geum* sp., *Rubus* sp. and *Vaccinium myrtillus* (Boczek and Kropczyńska 1964). *Trifolium* sp. and *Medicago* sp. belonging to *Fabaceae* are also known to be occasionally infested by this mite (Pritchard and Baker (1955)).

Tetranychini

1. *Eotetranychus carpini* (Oudemans, 1931) was observed on *Carpinus betulus* (Kraków – Botanical Garden, 27.06.2000) and *Quercus robur* 'Fastigiata' (Pisarzowice n/Brzeg, 13.09.2001). Mites live in large number on underside of leaves especially alongside the veins causing discolouration of leaves. Earlier in Poland this species was frequently collected from *C. betulus* and occasionally from *Alnus incana* and *Salix daphnoides* in parks (Dobosz et al. 1995). Specimens of this species were collected from *Quercus alba* and *Fagus grandiflora* by Reeves (1963) in USA. Biology of this mite was studied by Castagnoli et. al. (1989) and Bonato et al. (1990).

2. *Eotetranychus coryli* (Reck 1950) was found on *Acer negundo* 'Variegatum' (Skierniewice, 4.07.2000) and *Corylus avellana* (Warszawa, 10.06.1998). Mites occurred on underside of leaves at low density. No damage was noted. Until now in Poland it has been collected from *C. avellana* only (Boczek and Kropczyńska 1964; Skorupska 1988; Kozłowski and Skorupska 1995). *Acer rubrum* has also been listed as a host plant of this species in Washington (USA) by Pritchard and Baker (1955).

3. *Eotetranychus pruni* (Oudemans, 1931) was earlier called *E. viticola* (Reck, 1955), *E. aesculi* (Reck, 1950), *E. pomi* Sepasgosarian, 1956 and *Schizotetranychus kargalensis* Wainstein, 1956 (Bolland et al. 1998). This species was collected from *Aesculus* sp. (Pisarzowice n/Brzeg, 10.10.1997), but earlier it had been also recorded on fruit trees and shrubs in neglected orchards (Kropczyńska 1999). No damage was observed on leaves. *Aesculus hippocastanum* and *Acer platanoides* were reported as host plants of this mite by Reck (1950) from Georgia (S.S.R.).

4. *Eotetranychus tiliarum* (Hermann, 1804) was common on *Tilia cordata* and *T. platyphyllos*. These mites feeding on the underside of the leaves especially alongside the veins cause bronzing of leaves. In Poland high level of population of this spider mite was observed on *T. platyphyllos* and *T. americana*, while *T. cordata*, *T. euchlora*, *T. tomentosa* and *T. tomentosa* 'Varsaviensis' were less acceptable as host plants (Czajkowska 1998). *Castanea* sp., *Acer* sp., *Crataegus* sp. (Pellizzari-Scarltriti and Giulini 1983),

Table 1. Occurrence of the spider mites on ornamental trees and shrubs

Species of plant	Species of spider mite	Number of findings	Total number of findings for each family
Aceraceae			1
<i>Acer negundo</i> 'Variegatum'	<i>Eotetranychus coryli</i>	1	
Betulaceae			2
<i>Alnus incana</i> 'Aurea'	<i>Panonychus ulmi</i>	1	
<i>Betula humilis</i>	<i>Panonychus ulmi</i>	1	
Buxaceae			3
<i>Buxus sempervirens</i>	<i>Eurytetranychus buxi</i>	3	
Corylaceae			2
<i>Carpinus betulus</i>	<i>Eotetranychus carpini</i>	1	
<i>Corylus avellana</i>	<i>Eotetranychus coryli</i>	1	
Fagaceae			1
<i>Quercus robur</i> 'Fastigiata'	<i>Eotetranychus carpini</i>	1	
Hippocastanaceae			1
<i>Aesculus hippocastanum</i>	<i>Eotetranychus pruni</i>	1	
Leguminosae			1
<i>Cytisus</i> 'Hollandia'	<i>Bryobia praetiosa</i>	1	
Rosaceae			6
<i>Cotoneaster dammeri</i> 'Major'	<i>Panonychus ulmi</i>	1	
<i>Prunus laurocerasus</i>	<i>Panonychus ulmi</i>	1	
<i>Sorbus aria</i>	<i>Panonychus ulmi</i>	1	
<i>S. aucuparia</i>	<i>Panonychus ulmi</i>	1	
<i>S. intermedia</i>	<i>Panonychus ulmi</i>	2	
<i>S. intermedia</i>	<i>Tetranychus viennensis</i>	2	
Salicaceae			11
<i>Salix babylonica</i>	<i>Schizotetranychus schizopus</i>	1	
<i>S. brevipens</i>	<i>Schizotetranychus schizopus</i>	1	
<i>S. caprea</i>	<i>Schizotetranychus schizopus</i>	3	
<i>S. hastata</i>	<i>Schizotetranychus schizopus</i>	1	
<i>S. repens</i>	<i>Schizotetranychus schizopus</i>	1	
<i>S. sepulcralis</i>	<i>Schizotetranychus schizopus</i>	1	
<i>S. smithiana</i>	<i>Schizotetranychus schizopus</i>	2	
<i>S. subopposita</i>	<i>Schizotetranychus schizopus</i>	1	
Tiliaceae			6
<i>Tilia cordata</i>	<i>Eotetranychus tiliarum</i>	5	
<i>T. platyphyllos</i>	<i>Eotetranychus tiliarum</i>	1	
Ulmaceae			1
<i>Ulmus hollandica</i> 'Wredei'	<i>Panonychus ulmi</i>	1	
Total			37

Alnus japonica and *A. hirsuta* (Gotoh 1988) were also listed as host plants for *E. tiliarum*. The population dynamics of this mite on linden trees was studied by Kropczyńska and Czajkowska (1995) and by Czajkowska (1998; 1999).

Eurytetranychus buxi Garman, 1935 was found on *Buxus sempervirens* (Końskowola, 24.05.1995; Sompolno, 10.08.1995; Ciechanów 28.07.1997). The mite feeding on leaves of *B. sempervirens* caused mottling of leaves which later become yellow, and bronze. In Poland it was collected for the first time by Łabanowski (1983). According to Vinnik and Casteels (1998) this species occurs on wild type of *B. sempervirens*

Table 2. Occurrence of *Tetranychus urticae* on ornamental plants

Species of plant	Number of findings	Total number of findings for each family
1	2	3
Caprifoliaceae		22
<i>Kolkwitzia amabilis</i>	1	
<i>Lonicera periclymenum</i>	2	
<i>Sambucus nigra</i>	4	
<i>Symphoricarpos albus</i>	1	
<i>Viburnum carlcephalum</i>	1	
<i>V. carlesii</i>	2	
<i>V. lantana</i>	2	
<i>V. lantana</i> 'Aureum'	1	
<i>V. opulus</i> 'Nanum'	1	
<i>V. plicatum</i>	3	
<i>V. rhytidiphyllum</i>	1	
<i>Weigela florida</i>	3	
Rosaceae		21
<i>Exochorda racemosa</i>	1	
<i>Physocarpus opulifolius</i> 'Diabolo'	1	
<i>Prunus laurocerasus</i>	1	
<i>Potentilla fruticosa</i>	3	
<i>Sorbus aria</i>	1	
<i>S. aucuparia</i>	1	
<i>Spiraea japonica</i>	11	
<i>S. salicifolia</i>	1	
<i>S. cinerea</i> 'Grefsheim'	1	
Ulmaceae		10
<i>Ulmus hollandica</i> 'Wredei'	3	
<i>U. minor</i> 'Jacqueline Hillier'	7	
Salicaceae		9
<i>Populus nigra</i>	1	
<i>Salix arbuscula</i>	2	
<i>S. caprea</i>	2	
<i>S. moupinensis</i>	1	
<i>S. smithiana</i>	3	
Magnoliaceae		8
<i>Liriodendron tulipifera</i>	1	
<i>Magnolia</i> sp.	7	
Fabaceae		7
<i>Caragana arborescens</i>	1	
<i>Laburnum xwatereri</i>	4	
<i>Robinia pseudoacacia</i>	1	
<i>Sophora japonica</i>	1	
Aceraceae		7
<i>Acer negundo</i>	1	
<i>A. negundo</i> 'Flamingo'	2	
<i>A. palmatum</i>	2	
<i>A. platanoides</i> 'Columnare'	1	
<i>A. platanoides</i> 'Royal Red'	1	
Oleaceae		6
<i>Forsythia intermedia</i>	3	
<i>F. japonica</i> 'Maluch'	1	

1	2	3
<i>Fraxinus excelsior</i>	1	
<i>Syringa xprestorniae</i>	1	
Buddlejaceae		5
<i>Buddleja davidii</i>	5	
Celastraceae		7
<i>Euonymus europaeus</i>	1	
<i>E. fortunei</i> 'Emerald Gaiety'	3	
<i>E. fortunei</i> 'Emerald'n Gold'	3	
Hydrangaceae		4
<i>Deutzia scabra</i>	2	
<i>Hydrangea paniculata</i> 'Grandiflora'	2	
Thymelaceae		4
<i>Daphne mezereum</i>	4	
Ericaceae		3
<i>Rhododendron japonicum</i>	3	
Corylaceae		3
<i>Carpinus betulus</i>	3	
Moraceae		2
<i>Morus alba</i> 'Pendula'	2	
Anacardiaceae		1
<i>Cotinus coggygria</i>	1	
Betulaceae		1
<i>Betula humilis</i>	1	
Platanaceae		1
<i>Platanus acerifolia</i>	1	
Rutaceae		1
<i>Skimmia japonica</i>	1	1
Total		122

and all of its varieties, but 'Suffruticosa' is most susceptible to the infestation. Pritchard and Baker (1955) noted that *Buxus microphylla* was only rarely infested.

6. *Panonychus ulmi* (Koch, 1835) was found on *Alnus incana* 'Aurea' (Pisarzowice n/Brzeg, 8.07.1997), *Cotoneaster* 'Major' (Jasieniec n/Grójec, 19.07.1997), *Prunus* sp., (Pisarzowice n/Brzeg, 7.07. 1997), *Sorbus aucuparia* (Młynki n/Puławy, 16.05.2000), *S. intermedia* (Nowy Dwór n/Skierniewice, 1.09. 1997 and 12.05.1998; Braniewo, 21.07.1999), *S. aria* (Braniewo, 30.07.1997), *Ulmus carpiniifolia* 'Wredei' (Nowy Dwór n/Skierniewice, 12.05.1998). This mite was noted in large number only on *Cotoneaster* 'Major' and *S. intermedia*. Infested leaves of this plant were discoloured. This mite occurs in Poland mainly on trees and shrubs belonging to *Rosaceae* family and it is known as a major fruit pest. Its biology and control were presented earlier in many papers (Bielak 1986; Bielak and Dąbrowski 1986). *Sorbus* sp., *Castanea* sp. (Jeppson et al. 1975), *Frangula alnus*, *Robinia pseudoacacia* and *Ulmus campestris* are listed as host plants for this mite (Boczek and Kropczyńska 1964; Dobosz et al. 1995).

7. *Schizotetranychus schizopus* (Zacher, 1913) was collected from *Salix babylonica* (Konstancin-Jeziorna, 14.07.1999), *S. brevipens* (Pęchcin n/Ciechanów, 28.05.1996), *S. caprea* (Końskowola n/Puławy, 24.05.1995; 21.06.1995, Sielce n/Puławy, 11.06.1996), *S. hastata* (Pruszków, 12.05.1997), *S. integra* 'Hakuro Nishiki'

(Braniewo, 30.07.1997), *S. repens* (Pruszków, 28.05.1997), *S. sepulcralis* (Końskowola n/Puławy, 20.07.1995), *S. smithiana* (Nowakowo n/Elbląg, 17.09.1996 and Warszawa, 1.07.1998), *S. suboposita* (Końskowola n/Puławy, 30.06.1999). The mites feed on underside of the leaves, especially along the midrib, causing discolouration of them. Until now in Poland this mite has been only observed on the *S. caprea* and *Salix* sp. (Boczek and Kropczyńska 1965). We have confirmed the above information and added a few new host plants (Tab. 1). Our results indicate that *S. schizopus* is very common and dangerous pest on grafted willows in ornamental nurseries.

8. *Tetranychus viennensis* Zacher, 1921 was found on *Sorbus intermedia* (Bronisze, 2.08.1995 and Dziećmierowo n/Kórnik, 10.08.1995). No damage was observed. This host plant was also listed in Poland by Dobosz et al. (1995). However, this mite was most frequently recorded on *Malus* sp., *Prunus cerasifera* and *Crataegus laevigata*. Occasionally, it was also found on *Pyrus* sp., *Prunus avium*, *Rubus* sp. and *Prunus domestica* (Skorupska 1983). The observation made by Skorupska and Boczek (1984) on the acceptance of host plants indicated that best hosts for this mite were *Sorbus* sp., *Prunus cerasifera*, *P. cerasus* and *Pyrus communis*.

9. *Tetranychus urticae* Koch, 1835 was the most common spider mite in ornamental nurseries. It was recorded on 60 species of plants belonging to 17 families (Tab. 2). The most frequently infested species were: *Spiraea japonica* (Rosaceae), *Ulmus minor* 'Jacqueline Hillier' (Ulmaceae), *Magnolia* spp. (Magnoliaceae), *Buddleja davidii* (Buddlejaceae), *Sambucus nigra* (Caprifoliaceae), *Laburnum xwatererii* (Fabaceae) and *Daphne mezereum* (Thymelaceae). Less infested were *Cotinus coggygria* (Anacardiaceae), *Betula humilis* (Betulaceae), *Platanus acerifolia* (Platanaceae) and *Skimmia japonica* (Rutaceae). Our data confirmed that *T. urticae* was a polyphagous pest of many crops. This species has been recorded on more than 300 host plants (Boczek and Kropczyńska 1964; Kropczyńska 1999).

CONCLUSIONS

Ten species belonging to *Tetranychidae* family were found on ornamental trees and shrubs in Poland, *Bryobia praetiosa*, *Eotetranychus carpini*, *E. coryli*, *E. pruni*, *E. tiliarum*, *Eurytetranychus buxi*, *Panonychus ulmi*, *Schizotetranychus schizopus*, *Tetranychus viennensis* and *T. urticae*. The most common was *Tetranychus urticae* and it was noted on 60 species of plants belonging to 17 families. The plants most frequently infested by this mite were: *Spiraea japonica* (Rosaceae), *Ulmus minor* 'Jacqueline Hillier' (Ulmaceae), *Magnolia* spp. (Magnoliaceae), *Buddleja davidii* (Buddlejaceae), *Sambucus nigra* (Caprifoliaceae), *Laburnum xwatererii* (Fabaceae) and *Daphne mezereum* (Thymelaceae) and less infested were: *Cotinus coggygria* (Anacardiaceae), *Betula humilis* (Betulaceae), *Platanus acerifolia* (Platanaceae) and *Skimmia japonica* (Rutaceae). *S. schizopus* is worth remarking as a pest of grafted willows.

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POLISH SUMMARY

PRZĘDZIORKI (*TETRANYCHIDAE*) WYSTĘPUJĄCE NA DRZEWACH I KRZEWIACH OZDOBNYCH W SZKÓLKACH

Obserwacje prowadzone w latach 1995–2001 nad fauną zasiedlającą drzewa i krzewy ozdobne w szkółkach pozwoliły stwierdzić 10 gatunków przędziorków: *Bryobia praetiosa*, *Eotetranychus carpini*, *E. coryli*, *E. pruni*, *E. tiliarum*, *Eurytetranychus buxi*, *Panonychus ulmi*, *Schizotetranychus schizopus*, *Tetranychus viennensis* and *T. urticae*. Przędziorek chmielowiec (*T. urticae*) był gatunkiem najczęściej stwierdzanym w szkółkach. Wystąpił on na 60 gatunkach roślin należących do 17 rodzin. Najsilniej uszkodzane przez tego roztocza były: *Spiraea japonica* (*Rosaceae*), *Ulmus minor* 'Jacqueline Hillier' (*Ulmaceae*), *Magnolia* spp. (*Magnoliaceae*), *Buddleja davidii* (*Buddlejaceae*), *Sambucus nigra* (*Caprifoliaceae*), *Laburnum xwatererii* (*Fabaceae*) i *Daphne mezereum* (*Thymelaeaceae*). Spośród pozostałych gatunków przędziorków na uwagę zasługuje *S. schizopus*, szczególnie jako szkodnik wierzbieli miniaturowych.