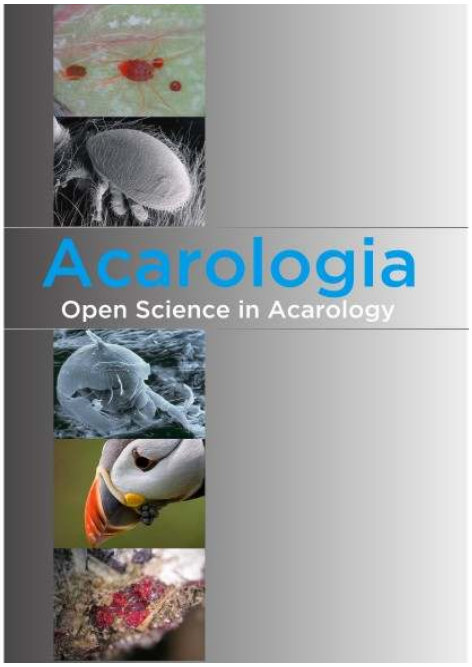

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Phytoseiid mites of Slovenia (Acari: Mesostigmata): new records and first description of the male of *Amblyseius microorientalis*

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Original research

ABSTRACT

Slovenia is a small country of Central Europe. Until recently, only limited surveys had been carried out of the Phytoseiidae fauna. The occurrence of 14 species had been documented in two international papers: 6 belonging to the subfamily Amblyseiinae, 1 to the subfamily Phytoseiinae and 7 to the subfamily Typhlodrominae. Four additional species (3 Amblyseiinae and 1 Phytoseiinae) were recorded and published recently but in a national journal and not mentioned in the world online database of Phytoseiidae. Here, we present results from 2018 and 2019 field surveys and add a total of 22 new records (18 if we consider national published records): 14 Amblyseiinae, 3 Phytoseiinae and 5 Typhlodrominae. The Phytoseiidae fauna of Slovenia contains after our study 36 species: 20 Amblyseiinae, 4 Phytoseiinae and 12 Typhlodrominae. Among the 22 new record species, at least 8 species are well-known biological control agents (BCA). In addition to the intrinsic value of phytoseiid mite biodiversity in temperate environments, demonstration of the natural occurrence of efficient BCAs is of great agricultural, commercial and strategic interests.

Keywords survey; collection; taxonomy; systematics
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Introduction

Phytoseiidae is an important family of predatory mites as several species in this family are important natural enemies controlling phytophagous mite and small insects in natural area, open field and protected crops all around the world (McMurtry and Croft 1997; McMurtry *et al.* 2013). However despite the huge numbers of faunistic surveys carried out for more than 70 years, the fauna of some countries and particular ecosystems remain little explored (Tixier *et al.* 2008). Consequently, it is important to make surveys in these poorly investigated areas to get more information on the biodiversity and to find there already known biological control agents (BCA) but also potential new BCA, especially in the context of new international and state regulations limiting import-export on natural enemies (Kreiter *et al.* 2020a, b). This family is widespread all over the world and consists presently of 2,521 valid species dispatched in three sub-families and 94 genera (Demite *et al.* 2014, 2020).

Slovenia is a small country of the Eastern Europe (29,273 km²), the 150th on 194 countries with continental, temperate and Mediterranean areas.

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The Slovenian phytoseiid mites fauna is presently officially composed of only 14 species (Demite *et al.* 2020) (6 belonging to the sub-family Amblyseiinae, 1 to the Phytoseiinae and 7 to the sub-family Typhlodrominae), namely: *Amblyseius andersoni* (Chant), *A. rademacheri* Dosse, *Neoseiulus cucumeris* (Oudemans), *N. reductus* (Wainstein), *Euseius finlandicus* (Oudemans), *Kampimodromus aberrans* (Oudemans), *Phytoseius macropilis* (Banks), *Neoseiulella tiliarum* (Evans), *Paraseiulus soleiger* (Ribaga), *P. talbii* (Athias-Henriot), *P. triporus* (Chant and Yoshida-Shaul), *Typhlodromus* (*Anthoseius*) *bakeri* (Garman), *T.* (*A.*) *rhenanus* (Oudemans), and *T.* (*Typhlodromus*) *pyri* Scheuten. In this world database, only one international paper (Bohinc and Trdan 2013) is actually indicated reporting species in Slovenia.

But more than these 14 species can be considered present in Slovenia. Actually, four additional species (three Amblyseiinae and one Phytoseiinae) were recorded and published recently but in a national journal (Bohinc *et al.* 2018) and not mentioned in the world database of Phytoseiidae (Demite *et al.* 2020). These four additional species are: *Euseius stipulatus* (Athias-Henriot), *E. gallicus* Kreiter and Tixier, *Neoseiulus californicus* (McGregor), and *Phytoseius horridus* Ribaga.

We report in this paper, which constitutes the second international contribution to the Slovenian Fauna, results of additional surveys realised in a two years project Proteus (2018 and 2019).

Material and methods

The survey took place in Slovenia in June 2018 and June 2019.

Plant inhabiting mites were collected from cultivated and wild plants in several locations in all parts of the country. Mites were directly collected on leaves with a fine brush or by using the leaf "dipping-shaking-washing-filtering (dswf)" method of Boller (1984) or by beating the plants (mainly shrubs or trees) and collecting the mites in a black plastic rectangular saucer 45 x 30 cm (Ref. STR 45, BHR, 71370 Saint-Germain-du-Plain, France). The method selected was depending on the plant investigated: large leaves of shrubs and trees with the direct collection method or with dswf, very small leaves or spines of shrubs and trees with the dswf or by beating and herbaceous plants with dswf.

Mites collected were transferred with a brush into small plastic vials containing 1.5 ml of 70° ethanol. Mites were then all mounted on slides using Hoyer's medium and all identified using a phase and interferential contrast microscope (DMLB, Leica Microsystèmes SAS, Nanterre, France). Characters of specimens were measured using a graduate eyepiece (Leica, see above).

We have used Chant and McMurtry's (1994, 2007) concepts of the taxonomy of the family Phytoseiidae the world catalogue database of Demite *et al.* (2014, 2020) for distribution. For identifications, the specimens were compared to the original description and re-description. In the description and re-description herein proposed, the setal nomenclature system adopted was that of Lindquist & Evans (1965) and Lindquist (1994), as adapted by Rowell *et al.* (1978) for the dorsum and by Chant & Yoshida-Shaul (1991) for the venter. The idiosomal setal pattern follows Chant & Yoshida-Shaul (1992). The notation for solenostomes and poroids is based on Athias-Henriot (1975). Numbers of teeth on the fixed and movable cheliceral digits do not include the respective apical teeth. Setae not referred to in the Results section should be considered as absent. All measurements are given in micrometers (µm) and presented as the mean in bold followed by the range in parenthesis.

Specimens of each species are deposited in the mite collections of Montpellier SupAgro conserved in UMR CBGP INRA/IRD/CIRAD/SupAgro Université de Montpellier.

Specimens collected in fields in Slovenia within these surveys were all identified. Very few single males or immatures collected alone were not taken into account.

The following abbreviations are used in this paper for morphological characters: **dsl** = dorsal shield length just under *j1* to just below *J5*; **dsw** ***s4*** = dorsal shield width at the level

of *s4*; ***Z4* ser.**, ***Z5* ser.** = *Z4*, *Z5* serrated (if *Z4* and *Z5* without ser. = not serrated); **gensl** = genital shield length; **gensw post. cor.** = genital shield width posteriorly; **lisl** = Largest inguinal sigilla (= "metapodal plate") length; **lisw** = Largest inguinal sigilla (= "metapodal plate") width; **sisl** = smallest inguinal sigilla (= "metapodal plate") length; **sisw** = smallest inguinal sigilla (= "metapodal plate") width; **vsl** = ventrianal shield length; **Dist. *gv3*** = distance between solenostomes *gv3* on the ventrianal shield; **vsw *ZV2* & *vsw anus*** = ventrianal shield width at *ZV2* level and at paranal setae level; **scl.:** calyx length; **scw** = calyx widest width; **Fdl** = fixed digit length; **Mdl** = movable digit length; **Nb teeth Fd** = number of teeth on the fixed digit; **Nb teeth Md** = number of teeth on the movable digit; **Shaft** = length of the shaft of spermatodactyl; **toe** = length of the toe; **BCA** = Biological control agents; **aasl** = altitude above sea level.

The following abbreviations are used in this paper for institutions: **CBGP** = Centre de Biologie pour la Gestion des Populations; **CIRAD** = Centre International de Recherche Agronomique pour le Développement; **INRAE** = Institut National de la Recherche en Agronomie et Environnement; **IRD** = Institut de Recherche pour le Développement; **MSA** = Montpellier SupAgro, France; **UMR** = Unité Mixte de Recherche.

Results and discussion

Subfamily Amblyseiinae Muma

Amblyseiinae Muma, 1961: 273.

Tribe Neoseiulini Chant & McMurtry

Neoseiulini Chant & McMurtry, 2003a: 6.

Genus *Neoseiulus* Hughes

Neoseiulus Hughes, 1948: 141.

Neoseiulus barkeri Hughes

Neoseiulus barkeri Hughes 1948: 142; Chant & McMurtry 2003a: 35; Moraes *et al.* 1986:70; Moraes *et al.* 2004: 104; Chant & McMurtry 2007: 25; Beaulieu & Beard 2018: 471.
Typhlodromus (*Neoseiulus*) *barkeri*, Nesbitt 1951: 31.
Typhlodromus (*Typhlodromus*) *barkeri*, Chant 1959: 61.
Typhlodromus (*Amblyseius*) *barkeri*, Hughes 1961: 222.
Typhlodromus barkeri, Hirschmann 1962: 144.
Amblyseius barkeri, Athias-Henriot 1961: 440.
Amblyseius (*Amblyseius*) *barkeri*, van der Merwe 1968: 112.
Amblyseius (*Neoseiulus*) *barkeri*, Karg 1993: 188.
Amblyseius masiaca Blommers & Chazeau 1974: 308 (synonymy according to Ueckermann & Loots 1988).
Amblyseius mckenziei Schuster & Pritchard 1963: 268 (synonymy according to Ragusa & Athias-Henriot 1983).
Amblyseius mycophilus Karg 1970: 290 (synonymy according to Ragusa & Athias-Henriot 1983).
Amblyseius oahuensis Prasad 1968: 1518 (synonymy according to Ragusa & Athias-Henriot 1983).
Amblyseius picketti Specht 1968: 681 (synonymy according to Ragusa & Athias-Henriot 1983).
Amblyseius (*Amblyseius*) pieteri Schultz 1972: 17 (synonymy according to Ueckermann & Loots 1988).
Amblyseius (*Amblyseius*) *usitatus* van der Merwe 1965: 71 (synonymy according to Ueckermann & Loots 1988).

This species belongs to the *barkeri* species group of the genus *Neoseiulus,* as the spermathecal atrium is large and forked at junction with the major duct. It belongs to the *barkeri* species subgroup as the calyx is not markedly constricted at junction with the atrium, the atrium is deeply forked at the junction with the major duct without vacuolated area, and the major duct, atrium and calyx are of approximately the same width (Chant and McMurtry 2003a).

Neoseiulus barkeri has a worldwide distribution (see below and Moraes *et al.* 2004a; Demite *et al.* 2020). It is a well-known predator of *T. urticae* and also of thrips, and is released in greenhouses (strawberry, cucumber, eggplant) to control them. Various studies have shown its ability to control *Frankliniella occidentalis* (Pergande) (Rodriguez-Reina *et al.* 1992), *Thrips tabaci* Lindeman (Broodsgaard and Hansen 1992) and *T. urticae* in cucumber (Fan and Petitt 1994b). Fan and Petitt (1994a) showed that augmentative releases of *N. barkeri* provided control of *Polyphagotarsonemus latus* (Banks) on peppers. *N. barkeri* constitutes a potential BCA in several crops especially vegetable greenhouses.

This is the first report of that species from Slovenia.

World distribution: Algeria, Argentina, Australia, Benin, Brazil, Burundi, Canary Islands, Cape Verde, Chile, China, Cyprus, Egypt, England, Finland, France, Georgia, Germany, Ghana, Greece, Guinea, Hawaii, India, Iran, Israel, Italy, Ivory Coast, Japan, Jordan, Kenya, La Réunion Island, Latvia, Madagascar Island, Malawi, Morocco, Mozambique, Netherlands, Nigeria, Norway, Oman, Portugal, Russia, Saudi Arabia, Senegal, South Africa, South Korea, Spain, Sweden, Syria, Tahiti Island, Thailand, Tunisia, Turkey, Ukraine, USA, West Bank, Yemen.

Specimens examined: A single ♀ during the two-year survey. Bukovica (altitude above sea level = aasl 49 m, lat. 45°54'06"N, long. 13°39'30"E), 1 ♀ on *Cucumis sativus* L. (Cucurbitaceae), 20/VI/2018.

Remarks: The description and measurements of the adult females collected agree with those provided by Ferragut *et al.* (2010) for specimens from Spain and by Kreiter *et al.* (2020) for specimens from La Réunion and various regions of the world.

Neoseiulus californicus (McGregor)

Typhlodromus californicus McGregor 1954: 89.
Amblyseius californicus, Schuster & Pritchard 1963: 271.
Cydnodromus californicus, Athias-Henriot 1977: 64.
Amblyseius (*Amblyseius*) *californicus*, Ueckermann & Loots 1988: 150; Ehara *et al.* 1994: 126.
Neoseiulus californicus, Moraes *et al.* 1986: 73; Chant & McMurtry 2003a: 21; Moraes *et al.* 2004a: 109; Chant & McMurtry 2007: 25; Guanilo *et al.* 2008a: 27, 2008b: 19; *sensu* Athias-Henriot 1977, Beaulieu & Beard, 2018: 469.
Amblyseius (*Neoseiulus*) *californicus,* Ehara & Amano 1998: 33.
Typhlodromus chilenensis Dosse 1958: 55 (synonymy according to Athias-Henriot 1977).
Typhlodromus mungeri McGregor 1954: 92 (synonymy according to Athias-Henriot 1959).
Amblyseius wearnei Schicha 1987: 103 (synonymy according to Tixier *et al.* 2014).

Neoseiulus californicus belongs to the *cucumeris* species group of *Neoseiulus* as the dorsocentral setae are not short relatively to dorsolateral setae. It belongs to the *cucumeris* species subgroup as spermatheca does not have a stalk between calyx and atrium, the atrium being undifferentiated or nodular and joined directly to calyx (Chant and McMurtry 2003a).

This species is distributed worldwide (see below and Moraes *et al.* 2004; Demite *et al.* 2020) and has been introduced in several countries for biological control issues. It is commercialised and released in various crops to control mite pests, especially *T. urticae* and *P. ulmi*. It is also naturally found on uncultivated plants or crops such as apple. Many studies deal with its biology. It is a specialized predator, Type 2. Nevertheless, it has characteristics of both specialist and generalist predatory mites (Castagnoli and Simoni 2003). It prefers to feed on spider mites (Gomez-Moya *et al.* 2009), but can also consume other mite species like

tarsonemid mites [*Phytonemus pallidus* (Banks)] (Easterbrook *et al.* 2001), small insects such as thrips (Rodriguez-Reina *et al.* 1992) and even pollen when prey is unavailable (Rhodes and Liburd 2006). It can migrate from grasses to fruit trees or grapevines and vice versa (Auger *et al.* 1999). It is a specialist predator of *T. urticae* on annual plants and woody species, and of *P. ulmi* and various *Tetranychus* spp. (and perhaps eriophyid mites) on trees and less frequently on grapevines (Auger *et al.* 1999). *N. californicus* is well known as a BCA sold in many countries around the world for the management of spider mites in greenhouses but also in outdoor crops such as fruit crops in Europe.

This species was already recorded and mentioned in a Slovenian papers, like Bohinc and Trdan (2015) and Bohinc *et al.* (2018) but it is the first mention of that species in an international paper for Slovenia.

World distribution: Algeria, Argentina, Australia, Azores, Brazil, Canada, Canary Islands, Chile, Colombia, Cuba, Cyprus, France, Greece, Guadeloupe Island, Guatemala, Italy, Japan, La Réunion Island, Mexico, Morocco, Peru, Portugal, Senegal, Serbia, South Africa, South Korea, Spain, Syria, Taiwan, Tunisia, Turkey, Uruguay, USA, Venezuela.

Specimens examined: 27 ♀♀, 8 ♂♂ and 7 immatures in total. Bukovica (aasl 49 m, lat. 45°54'06"N, long. 13°39'30"E), 22 ♀♀, 7 ♂♂ and 7 immatures on *Cucumis sativus* L. (Cucurbitaceae), 20/VI/2018; Izola-Pivol (aasl 30 m, lat. 45°32'27"N, long. 13°40'51"E), 1 ♀ on *Pyrus communis* L. (Rosaceae), 21/VI/2018; Sečovlje (aasl 2 m, lat. 45°28'33"N, long. 13°37'06"E), 2 ♀♀ on *C. sativus*, 20/VI/2018; Spodnje Škofije-Purissima (aasl 50 m, lat. 45°34'21"N, long. 13°46'31"E), 2 ♀♀ and 1 ♂ on *Capsicum annuum* L. (Solanaceae), 11/VII/2019.

Remarks: The description and measurements of the adult females collected agree with those provided by Tixier *et al.* (2008) for specimens of the world, by Ferragut *et al.* (2010) for specimens from Spain and by Kreiter *et al.* (2020) for specimens from La Réunion and various regions in the world.

Neoseiulus umbraticus (Chant)

Typhlodromus umbraticus Chant 1956: 26.
Typhlodromus (*Typhlodromus*) *umbraticus*, Beglyarov 1958: 107.
Amblyseius umbraticus, Athias-Henriot 1959: 138.
Typhlodromus (*Amblyseius*) *umbraticus*, Chant 1959: 75.
Amblyseius (*Typhlodromopsis*) *umbraticus*, Muma 1961: 287.
Amblyseius (*Amblyseius*) *umbraticus*, Wainstein & Vartapetov 1973: 103.
Amblyseius (*Neoseiulus*) *umbraticus*, Karg 1991: 23.
Neoseiulus umbraticus, Moraes *et al.* 1986: 99; 2004: 149; Chant & McMurtry 2003a: 23; 2007: 31.

Just like the previous species and for same reasons, this species belongs to the *cucumeris* species group of the genus *Neoseiulus* and to the *cucumeris* species subgroup (Chant and McMurtry 2003a).

Very few studies exist on its biology. Knisley and Swift (1971) and Kazak *et al.* (2002) showed its ability to develop feeding on *T. urticae*. Sengonca & Dresher (2001) studied the ability of this species to develop feeding on *Thrips tabaci* Lindeman and concluded that this food alters its biological parameters in comparison to *T. urticae*. *N. umbraticus* seems able to develop and reproduce also on *Panonychus ulmi* (Koch), *Calvolia lordi* (Nesbitt), *Aculus schlechtendali* (Nalepa), adults of *Quadraspidiotus perniciosus* (Comstock), and on apple and cherry pollens. Adults of *Agistemus fleschneri* Summers and winter eggs of *P. ulmi* were not fed upon.

This is the first report of that species from Slovenia.

World distribution: Armenia, Azerbaijan, Azores, Belarus, Caucasus Region, Denmark, England, France, Georgia, Germany, Hungary, Iran, Italy, Jamaica, Latvia, Mexico, Moldovia,

Montenegro, Morocco, Norway, Poland, Russia, Slovakia, Spain, Switzerland, Turkey, Ukraine, USA.

Specimens examined: 14 ♀♀, 7 ♂♂ and 4 immatures in total. Škofljica, Gumnišče 15 (aasl 305 m, 45°58'15"N, 14°34'17"E), 1 ♀ on *Carpinus betulus* L. (Betulaceae), 18/VI/2019; Kranj (aasl 434 m, 46°16'6"N, 14°20'26"E), 12 ♀♀, 7 ♂♂ and 4 immatures on *Rubus fruticosus* L. (Rosaceae), 21/VI/2019; Ljubljana, Hotel Katrca (aasl 307 m, 46°3'19"N, 14°20'26"E), 1 ♀ on *Tilia platyphyllos* Scopoli (Malvaceae), 22/VI/2019.

Remarks: The description and measurements of the adult females collected agree with those provided by Chant *et al.* (1982) and by Ferragut *et al.* (2010) for specimens from Spain.

Tribe Kampimodromini Kolodochka

Kampimodromini Kolodochka, 1998: 59; Chant & McMurtry, 2003b: 189; 2006b: 137; 2007: 33.

Subtribe Kampimodromina Chant & McMurtry

Kampimodromina Kolodochka, Chant & McMurtry 2003b: 193.

Genus *Kampimodromus* Nesbit

Kampimodromus Nesbitt, 1951: 53.

Kampimodromus aberrans (Oudemans)

Typhlodromus aberrans Oudemans 1930a: 48-49.
Typhlodromus (*Typhlodromus) aberrans*, Beglyarov 1957: 373.
Amblyseius aberrans, Athias-Henriot 1958b: 36.
Typhlodromus (*Amblyseius*) *aberrans*, Chant 1959: 101.
Paradromus aberrans, Muma 1961: 286.
Amblyseius (*Kampimodromus*) *aberrans*, Pritchard & Baker 1962: 294; Wainstein 1962: 14; Ehara 1966: 25.
Amblyseius (*Amblyseius*) *aberrans*, Tseng 1976: 108.
Kampimodromus aberrans, Muma & Denmark 1968: 234; Chant & McMurtry 2003b: 196: Moraes *et al.* 2004: 93; Chant & McMurtry 2007: 37.
Kampimodromus (*Kampimodromus*) *aberrans*, Karg 1983: 305.
Typhlodromus vitis Oudemans 1930c: 99 (synonymy according to Chant 1955).

Kampimodromus aberrans is a very common species in orchards, vineyards and wild plants in Europe and in North-Africa where it might be closely associated with several species of spider and eriophyid mites (Duso 1992; Schausberger 1997; Tixier *et al.* 1998, 2000a, b; Kreiter *et al.* 2000; Tsolakis and Ragusa 2017).

This species has been mentioned previously from Slovenia (Miklavc 2006; Bohinc and Trdan 2013; Bohinc *et al.* 2018). With 324 specimens in total in 13 locations, it is one of the most commonly species found in this survey.

World distribution: Albania, Algeria, Armenia, Austria, Azerbaijan, Belarus, Bulgaria, Canada, Caucasus Region, Croatia, Czechoslovakia, Czech Republic, England, France, Georgia, Germany, Greece, Hungary, Iran, Israel, Italy, Moldova, Montenegro, Morocco, Netherlands, Norway, Poland, Portugal, Russia, Serbia, Slovakia, Slovenia, Spain, Switzerland, Tunisia, Turkey, Ukraine, USA.

Specimens examined: 227 ♀♀, 48 ♂♂ and 49 immatures in total. Bukovica (aasl 49 m, lat. 45°54'06"N, long. 13°39'30"E), 2 ♀♀ on *Ficus carica* L. (Moraceae), 20/VI/2018; Nova Gorica, Restaurant Pri hrastu (aasl 96 m, lat. 45°57'26"N, long. 13°38'50"E), 15 ♀♀, 1 ♂ and 1 immature on *Morus alba* L. (Moraceae), 20/VI/2018; Izola-Pivol (aasl 30 m, lat. 45°32'27"N, long. 13°40'51"E), 1 ♀ on *Prunus cerasus* L. (Rosaceae) and 1 ♂ on *Juglans*

regia L. (Juglandacae), 21/VI/2018; Parecag (aasl 72 m, lat. 45°28'44"N, long. 13°37'49"E), 23 ♀♀ and 4 ♂♂ on *P. cerasus* and 47 ♀♀ and 1 ♂ on *Prunus domestica* L. (Rosaceae), 25 ♀♀, 5 ♂♂ and 5 immatures on *F. carica* and 47 ♀♀, 6 ♂♂ and 12 immatures on *Diospyros kaki* Thunberg (Ebenaceae), 21/VI/2018; Dragonja (aasl 1 m, lat. 45°27'12"N, long. 13°39'43"E), 30 ♀♀, 15 ♂♂ and 3 immatures on *F. carica*, 21/VI/2018; Ljubljana, Hotel Azur (aasl 296 m, 46°02'42"N, 14°28'25"E), 5 ♀♀ on *Corylus avellana* L. (Betulaceae), 22/VI/2018; Lucija (aasl 22 m, lat. 45°30'30"N, long. 13°36'11"E), 2 ♀♀ on *F. carica*, 11/VII/2018; Sečovlje, Parecag 15 (aasl 10 m, lat. 45 28'50''N, long. 13 37'49''E), 7 ♀♀, 9 ♂♂ and 7 immatures on *F. carica*, 19/VI/2019; Sečovlje, 58a (aasl 3 m, lat. 45°28'43"N, long. 13°37'28"E), 1 ♀ and 1 immature on *J. regia*, 11 ♀♀, 4 ♂♂ and 15 immatures and 1 ♀ and 1 immature on *Aesculus hippocastanum* L. (Hippocastanaceae), 19/VI/2019; Dragonja (aasl 3 m, lat. 45°27'32"N, long. 13°39'04"E), 1 ♀, 2 ♂♂ and 2 immatures on *Malus domestica* Miller and 4 ♀♀ on *Prunus pumila* L. (Rosaceae), and 3 ♀♀ and 2 immatures on *D. kaki*, 19/VI/2019; Bertoki (aasl 28 m, lat. 45°32'55"N, long. 13°47'13"E), 2 ♀♀ and 1 immature on *Actinidia deliciosa* (A. Chev.) C.F. Liang & A.R. Ferguson (Actinidiaceae), 19/VI/2019; Pragersko, Kvedrova ulica (aasl 250 m, 46°23'48"N, 13°40'11"E), 1 ♀ on *Quercus rubra* L. (Fagaceae), 20/VI/2019; Spodnje Škofije-Purissima (aasl 50 m, lat. 45°34'21"N, long. 13°46'31"E), 4 ♀♀, on *Capsicum annuum* L. (Solanaceae), 11/VII/2019.

Remarks: The description and measurements of the adult females collected agree with those provided by Tixier *et al.* (2003) for specimens from France and with Ferragut *et al.* (2010) for specimens from Spain.

Kampimodromus corylosus Kolodochka

Kampimodromus corylosus Kolodochka 2003b: 51; Chant & McMurtry 2007: 37.

This species is often collected on hazelnut and seems a good predator of tetranychid and eriophyid mites occurring on this plant. But despite these very general observations, the biology of that species is almost totally unknown.

This is the first mention report of that species from Slovenia.

World distribution: Croatia, Hungary, Moldova, Ukraine.

Specimens examined: 16 ♀♀, 4 ♂♂ and 7 immatures in total. Kočevska Reka, Lake (aasl 567 m, 45°34'33"N, 14°47'25"E), 1 ♀, 1 ♂ and 1 immature on *Tilia platyphyllos* Scopoli (Malvaceae), 18/VI/2019; Pragersko, Kvedrova ulica (aasl 250 m, 46°23'48"N, 13°40'11"E), 2 ♀♀, 2 ♂♂ and 1 immature on *Populus tremula* L. (Salicaceae), 20/VI/2019; Juršinci, Gabrnik 55 (aasl 301 m, 46°28'43"N, 15°58'2"E), 8 ♀♀, 2 ♂♂ and 3 immatures on *Corylus avellana* L. (Betulaceae), 2 ♀♀, 1 ♂ and 2 immatures on *Prunus persica* and 1 ♀ on *Prunus cerasus* L. (Rosaceae), 20/VI/2019; Šobec (aasl 418 m, 46°21'22"N, 14°9'2"E), 1 ♀ on *C. avellana* and 1 ♀ on *Juglans regia* L. (Juglandaceae), 21/VI/2019.

Remarks: The description and measurements of the adult females collected agree with those provided by Kolodochka (2003) in the original description and by (Tixier *et al.* 2008).

Tribe Phytoseiulini Chant & McMurtry

Phytoseiulini Chant & McMurtry, 2006a: 7.

Genus *Phytoseiulus* Evans

Phytoseiulus Evans, 1952: 397.

Phytoseiulus persimilis Athias-Henriot

Phytoseiulus persimilis Athias-Henriot 1957: 347; Moraes *et al.* 1986: 109; Moraes *et al.* 2004a: 169; Chant & McMurtry 2006a: 20; 2007: 55.
Typhlodromus persimilis, Hirschmann 1962: 75.

Phytoseiulus (*Phytoseiulus*) *persimilis*, Wainstein 1962: 17.
Phytoseiulus riegeli Dosse 1958: 48-55 (synonymy according to Chant 1959).
Amblyseius tardi Lombardini 1959: 166 (synonymy according to Kennett & Caltagirone 1968).

Phytoseiulus persimilis is probably one of the best-known phytoseiid species in the world, because of its use to control *T. urticae* in greenhouses all over the world. It is a Mediterranean / subtropical predatory mite, a type I species, *i.e.* a specialist predator of the *urticae* species group of the genus *Tetranychus* (McMurtry and Croft 1997; McMurtry *et al.* 2013). Considerable research has been conducted on this predator-prey interactions (see review by Kostiainen and Hoy 1996), and numerous biological control programs have used *P. persimilis* against *T. urticae* on a wide range of ornamental and vegetable crops. *P. persimilis* was the first greenhouse biological control agents available commercially and it is one of the most successful BCA in the world. It can also be used in temperate climates on open-field crops such as strawberries. Optimum conditions are 20-27 °C and relative humidity of 60-90 %. Cooler or warmer temperatures may have a negative effect on reproduction, development and efficiency of this predatory mite (Escudero and Ferragut 2005). This species is present in Slovenia probably because of its commercial introduction and uses in vegetable and ornamental greenhouses, dispersion of some specimens released and establishment in the environment.

This is the first report of that species from the Slovenian fauna.

World distribution: Algeria, Australia, Canada, Canary Islands, Chile, China, Costa Rica, Cyprus, Egypt, Finland, France, Greece, Guatemala, Hungary, Iran, Israel, Italy, Japan, Jordan, Kenya, La Réunion Island, Latvia, Lebanon, Lybia, Martinique Island, Mauritius Island, Morocco, Netherlands, New Caledonia, Peru, Philippines, Portugal, Serbia, South Africa, South Korea, Spain, Syria, Tunisia, Turkey, USA, Venezuela.

Specimens examined: 6 ♀♀ in total. Sečovlje (aasl 2 m, lat. 45°28'33"N, long. 13°37'06"E), 6 ♀♀ on *Cucumis sativus* L. (Cucurbitaceae), 11/VII/2018.

Remarks: The description and measurements of the adult females collected agree with those provided by Ferragut *et al.* (2010) for specimens of Spain and by Kreiter *et al.* (2018, 2020) for specimens from Mauritius, La Réunion and various regions in the world.

Tribe Typhlodromipsini Chant & McMurtry

Typhlodromipsini Chant & McMurtry 2005c: 318.

Genus *Typhlodromips* De Leon

Typhlodromipsini Chant & McMurtry 2005c: 318; 2006b: 137; 2007: 55.

Typhlodromips driggeri (Specht)

Amblyseius driggeri Specht 1968: 681.
Typhlodromips driggeri, Moraes *et al.* 1986: 140; 2004: 212.
Neoseiulus driggeri, Chant & McMurtry 2003a: 17; 2007: 29.
Typhlodromips assiniboin Chant & Hansell 1971: 728 (synonymy according to Denmark & Evans 2011).

According to Denmark and Evans (2011), species of *Typhlodromips* have macrosetae on legs II, III and IV (and also on leg I, see above) and species of *Neoseiulus* have in general no macrosetae on legs I to III. The specimens here observed have macrosetae on all legs and is thus a *Typhlodromips* and not a *Neoseiulus*. According with the same authors, *T. driggeri* is a senior synonym of *Typhlodromips assiniboin* (Chant and Hanssel) placed by Chant and McMurtry (2007) in the genus *Typhlodromips* and not in the genus *Neoseiulus* (oppositely to the species *driggeri* placed in *Neoseiulus* by these two authors). Demite *et al.* (2020) following Moraes *et al.* (1986, 2004) placed also this species in the genus *Typhlodromips* and according with those authors, this species is considered to be a *Typhlodromips* and not a *Neoseiulus*.

According Chant & McMurtry (2007), this species belongs to the *lugubris* species group as seta *Z1* is absent, and the calyx of the spermatheca is elongate, tubular.

The biology of that species is totally unknown. It was collected in orchard in Northern America and Canada but was never recorded outside of Northern America.

This is consequently the first report of that species from Slovenia and the first mention in Europe. Why this species is recorded in Slovenia as it was never recorded in other countries well investigated in Europe remain totally unknown.

World distribution: Canada, USA.

Specimens examined: 3 ♀♀ in total. Straža pri Raki (aasl 240 m, lat. 45°55'28"N, long. 15°24'26"E), 3 ♀♀ on *Cucumis sativus* L. (Cucurbitaceae), 19/VI/2018.

Remarks: The measurements of the three adult females collected agree quite well with those provided by Specht (1968) for specimens collected in New Jersey in apple orchards and with Chant and Hansell (1971) for specimens from various places in Eastern Canada (Québec, Manitoba, Ontario), with only some slight variations (Table 1).

Tribe Amblyseiini Muma

Amblyseiini Muma, 1961: 68.

Subtribe Amblyseiina Muma

Amblyseiina Muma, 1961: 69.

Table 1 Character measurements of adult females of *Typhlodromips driggeri* collected in this study with those in previous studies (localities followed by the number of specimens measured between brackets).

Characters	**Slovenia** (3) (this study)	**Canada** (?)	**USA** (6)	Characters	**Slovenia** (3) (this study)	**Canada** (?)	**USA** (6)
Dsl	**332** (310 – 363)	340	354 (346 – 362)	Gensl	**115**	-	120 (118 – 122)
Dsw *s4*	**229** (213 – 245)	220	214 (211 – 217)	*st5-st5*	**66** (64 – 68)	-	-
j1	**25**	-	25	Gensw post.corn.	**72** (68 – 75)	70	81 (79 – 83)
j3	**30** (28 – 31)	-	27	Lisl	**18** (15 – 20)	-	18
j4	**14** (13 – 15)	-	15	Lisw	**6** (6 – 7)	-	8
j5	**14** (14 – 15)	-	18	Sisl	**12** (10 – 13)	-	13
j6	**19** (18 – 20)	-	18	Sisw	**2** (1 – 2)	-	2
J2	**21** (20 – 21)	-	21	Vsl	**117** (115 – 118)	126	119 (117 – 121)
J5	**13**	-	14	Vsw *ZV2*	**88** (83 – 93)	92	95 (93 – 97)
r3	**21** (20 – 23)	-	22	Vsw anus	**79** (75 – 83)	-	-
R1	**20**	-	19	*gv3* dist.	**18** (17 – 18)	-	15
s4	**40** (39 – 40)	-	38	*JV5*	**18** (17 – 18)	-	-
S2	**35** (35 – 36)	34	36	*SgeI*	**24** (23 – 25)	-	-
S4	**22** (20 – 23)	22	25	*SgeII*	**24** (23 – 25)	-	-
S5	**23** (22 – 23)	22	22	*SgeIII*	**24** (23 – 25)	-	27
z2	**21** (20 – 23)	-	20	*SgeIV*	**39** (38 – 40)	-	44
z4	**25** (23 – 26)	-	24	*StiIV*	**21** (20 – 23)	-	-
z5	**15** (14 – 15)	-	**?**	*StIV*	**56** (53 – 58)	-	62
Z1	**24** (23 – 25)	22	25	Scl	**39** (38 – 40)	-	28
Z4	**54** (53 – 56)	54	51	Scw	**10** (9 – 12)	-	-
Z5	**82** (80 – 85)	84	68	Fdl	**30** (30 – 31)	-	-
st1-st1	**57** (56 – 58)	-	-	No teeth Fd	**9**	-	9
st2-st2	**64** (63 – 67)	-	-	Mdl	**31** (31 – 32)	-	-
st3-st3	**73** (70 – 75)	-	-	No teeth Md	**3**	-	3
st1-st3	**64** (63 – 65)	-	-				
st4-st4	**81** (78 – 85)	-	-				

Sources of measurements – Canada (cited as *Amblyseius assiniboin* Chant & Hansell, junior synonym of *T. driggeri* according to Denmark & Evans 2011): Chant & Hansell (1971); USA: original description of Specht 1968); - : not provided.

Genus *Transeius* Chant & McMurtry

Transeius Chant & McMurtry, 2004a: 181.

Transeius fragilis (Kolodochka & Bondarenko)

Amblyseius fragilis Kolodochka & Bondarenko 1993: 34.
Typhlodromips fragilis, Moraes *et al.* 2004: 213.
Transeius fragilis, Chant & McMurtry 2004a: 187; 2007: 71.

This species belongs to the *bellottii* species group as seta *z4* is not as long as 2/3 distance between its base and that of seta *s4*. The spermatheca has the calyx bell-shaped and that keys to *bellottii* species subgroup.

This species was described by Kolodochka and Bodarenko (1993) with specimens collected in the Black Sea National Biosphere Reserve, Solenoozernyy, Kherson Region, Ukraine, on *Taraxacum* sp. for the holotype and on *Frankenia hirsuta* L. and *Cirsium* sp. for the paratypes.

The biology of that species is totally unknown.

This is the first report of that species from Slovenia.

World distribution: Ukraine.

Specimens examined: 3 ♀♀ in total. Podgorje (aasl 228 m, lat. 46°42'18"N, long. 15°49'13"E), 1 ♀ on *Phaseolus vulgaris* L. (Fabaceae) and 2 ♀♀ on *Fragaria* sp. (Rosaceae), 12/VII/2018.

Remarks: The measurements of the three adult females (Table 2) collected agree quite well with those provided by Kolodochka and Bodarenko (1993) for specimens collected on diverse plant species from Ukraine, with only slightly longer setae *z4* and *S2,* and slightly shorter macrosetae of the leg IV in the Slovenian specimens.

Transeius volgini (Wainstein & Beglyarov)

Amblyseius volgini Wainstein & Beglyarov, 1971: 1804.
Amblyseius (*Amblyseius*) *volgini*, Wainstein 1979: 140, 142.
Typhlodromips volgini, Moraes *et al.* 1986: 152; 2004: 229.
Transeius volgini, Chant & McMurtry 2004a: 187; 2007: 71.
Transeius magnus Wu 1987: 261 (synonymy according to Ryu & Ehara 1991).

Like *T. fragilis*, this species belongs to the *bellottii* species group and to the *bellottii* species subgroup (Chant and McMurtry 2004a).

The biology of that species is totally unknown.

This is the first report of that species from Slovenia.

World distribution: China, Russia, South Korea.

Specimens examined: 2 ♀♀ and 3 ♂♂ in total. Šobec (aasl 418 m, lat. 46°21'22"N, long. 14°9'2"E), 2 ♀♀ and 2 ♂♂ on *Picea abies* (Pinaceae) and 1 ♂ on *Corylus avellana* L. (Betulaceae), 21/VI/2019.

Remarks: The description and measurements of the two adult females and the three adult males (Table 3) collected agree well with those provided by Wainstein and Beglyarov (1971) for Russia, by Wu (1987) for China [for *T. magnus*, junior synonym of *T. volgini* according to Ryu and Ehara (1991)] and by Ryu and Ehara (1991) for South Korea. *T. volgini* is similar to *T. herbarius* Wainstein but with important differences in setae measurements and less teeth in both digits in chelicerae.

Genus *Amblyseius* Berlese

Amblyseius Berlese, 1914: 143.

Amblyseius andersoni (Chant)

Typhlodromus andersoni Chant 1957: 296.
Typhlodromus (*Amblyseius*) *andersoni*, Chant 1959: 92.
Amblyseius (*Amblyseius*) *andersoni*, Muma 1961: 287.
Typhlodromus (*Typhlodromus*) *andersoni*, Westerboer & Bernhard 1963: 682-689.
Amblyseius (*Multiseius*) *andersoni*, Denmark & Muma 1989: 84.
Amblyseius andersoni, Athias-Henriot 1958b: 33; Moraes *et al.* 2004: 14; Chant & McMurtry 2004a: 199; 2007: 75.
Amblyseiopsis potentillae Garman 1958: 7 (synonymy according to Chant & Yoshida-Shaul 1990).
Amblyseius charui Gupta (synonymy according to Gupta 1985).
Amblyseius reflexus Knisley & Denmark 1978: 8-10 (synonymy according to Chant & Yoshida-Shaul 1990).
Typhlodromus (*Amblyseius*) *britannicus* Chant 1959: 87-88 (synonymy according to Chant & Yoshida-Shaul 1990).

This species belongs to the *obtusus* species group with presence of setae *J2* and *Z1*, seta

Table 2 Comparison of character measurements of adult females of *Transeius fragilis* collected in this study with those in previous studies (localities followed by the number of specimens measured between brackets).

Characters	**Slovenia** (3) (this study)	**Ukraine** (?)	Characters	**Slovenia** (3) (this study)	**Ukraine** (?)
Dsl	**350** (348 – 355)	390	Gensl	**116** (113 – 120)	-
Dsw *s4*	**184** (178 – 190)	215	*st5-st5*	**70** (63 – 78)	-
j1	**25** (24 – 27)	26	Gensw post.corn.	**74** (68 – 85)	-
j3	**39** (36 – 40)	34	Lisl	**25** (23 – 26)	-
j4	**8** (7 – 9)	9	Lisw	**6** (5 – 7)	-
j5	**8** (8 – 9)	9	Sisl	**17** (13 – 20)	-
j6	**13** (12 – 13)	10 – 12	Sisw	**3**	-
J2	**13** (10 – 14)	10 – 12	Vsl	**128** (120 – 133)	130
J5	**10** (10 – 11)	9	Vsw *ZV2*	**96** (90 – 105)	97
r3	**24** (23 – 25)	22	Vsw anus	**84 (78 – 90)**	-
R1	**20** (20 – 21)	17	*JV5*	**62** (58 – 65)	65
s4	**51** (48 – 53)	49	*SgeII*	**23**	-
S2	**45** (43 – 46)	36	*SgeIII*	**26** (25 – 28)	-
S4	**20** (19 – 20)	22	*StiIII*	**24** (23 – 25)	-
S5	**15** (13 – 17)	14	*SgeIV*	**50** (48 – 53)	56
z2	**25** (23 – 28)	23	*StiIV*	**39** (38 – 41)	44
z4	**26** (25 – 28)	18	*StIV*	**77** (75 – 78)	82
z5	**5** (5 – 6)	6	Scl	**12** (10 – 15)	-
Z1	**17** (15 – 18)	15	Scw	**10** (8 – 15)	-
Z4	**62** (58 – 65)	56	Fdl	**29** (28 – 30)	-
Z5	**84** (80 – 88)	85	No teeth Fd	**7**	-
st1-st1	**56** (55 – 58)	-	Mdl	**32** (30 – 33)	-
st2-st2	**69** (68 – 71)	-	No teeth Md	**2**	-
st3-st3	**78** (75 – 83)	-			
st1-st3	**70** (68 – 73)	-			
st4-st4	**79** (70 – 88)	-			

Sources of measurements – Ukraine: Kolodochka & Bodarenko (1993); - : not provided.

Table 3 Character measurements of adult females and males of *Transeius volgini* collected in this study and those in previous studies (localities followed by the number of specimens measured between brackets).

	♀				♂		
Characters	**Slovenia** (2) (this study)	**China** (5)	**Russia** (2)	**South Korea** (10)	**Slovenia** (3) (this study)	**China** (1)	**South Korea** (6)
Dsl	**413 – 415**	380 – 400	400	389	**309** (266 – 335)	350 – 360	335
Dsw *s4*	**242 – 248**	250 – 265	230	238	**214** (205 – 214)	242 – 251	250
j1	**25 – 28**	25 – 27	27	24 (23 – 25)	**23** (21 – 24)	24	22 (21 – 23)
j3	**43 – 45**	43 – 44	38	40	**43** (40 – 43)	43	40 (39 – 41)
j4	**8**	8	9 – 10	8 (7 – 8)	**7** (7 – 8)	8	7 (6 – 7)
j5	**7 – 8**	8	9 – 10	7 (6 – 7)	**7** (5 – 8)	8	7 (6 – 7)
j6	**8 – 9**	8	9 – 10	7 (7 – 8)	**7** (7 – 8)	8	8 (7 – 8)
J2	**8**	8	9 – 10	7	**7** (7 – 8)	8	7
J5	**12 – 13**	10 – 13	9 – 10	10	**10** (9 – 10)	11	9
r3	**19 – 20**	18 – 20	-	19 -18 – 19)	**18** (17 – 18)	20	18 (17 – 18)
R1	**18**	20	-	19 (18 – 19)	**17** (16 – 18)	18 – 19	17 (16 – 17)
s4	**50**	53 – 54	45	46 (46 – 47)	**45** (42 – 45)	48	44 (39 – 45)
S2	**23 – 24**	23 – 25	20	22 (21 – 23)	**16** (15 – 16)	20	20 (19 – 21)
S4	**13 – 15**	13	11	12 (11 – 13)	**10**	11 – 13	12
S5	**12 – 13**	13	10	10 (10 – 11)	**10**	10 – 13	11
z2	**19 – 20**	20 – 23	18	19 (18 – 20)	**15** (15 – 16)	14	14 (13 – 15)
z4	**13**	15	13	14 (13 – 15)	**13** (12 – 13)	13	13
z5	**5 – 6**	8	9	6	**5**	8	6 (5 – 6)
Z1	**9 – 10**	10	9	10	**9** (8 – 10)	8 – 9	9 (9 – 10)
Z4	**65 – 68**	65 – 66	62	66 (65 – 67)	**62** (60 – 63)	60 – 64	62 (60 – 63)
Z5	**105 – 108**	100 – 105	108	101 (99 – 103)	**93** (90 – 95)	88 – 95	89 (86 – 91)
st1-st1	**57 – 60**	-	-	-	**52** (48 – 54)	-	-
st2-st2	**78 – 80**	-	-	-	**69** (68 – 70)	-	-
st3-st3	**88 – 92**	-	-	-	**72** (70 – 75)	-	-
st1-st3	**78**	-	-	-	**133** (130 – 133)	-	-
st4-st4	**88 – 93**	-	-	-	**60** (58 – 63)	-	-
Gensl	**138 – 150**	-	-	-	Not applicable		
st5-st5	**80 – 85**	-	-	-	**49** (48 – 50)	-	-
Gensw post.corn.	**93**	-	-	-			
Lisl	**28**	-	-	-	Not applicable		
Lisw	**5 – 7**	-	-	-			
Sisl	**13 – 15**	-	-	-			
Vsl	**2 – 3**	-	-	-	**156** (155 – 158)	-	-
Vsw *ZV2*	**140 – 143**	-	-	-	**186** (178 – 195)	-	-
Vsw anus	**108 – 118**	-	-	-	**53** (50 – 58)	-	-
Dist. *gv3*	**50 – 55**				**40** (38 – 43)	-	-
JV5	**55**	54 – 55	-	52 (52 – 53)	**40** (36 – 40)	40	40 (38 – 42)
SgeI	**20 – 21**	-	-	-	**19** (18 – 20)	-	-
SgeII	**30**	-	-	-	**25**	-	-
SgeIII	**35 – 37**	-	-	-	**25** (23 – 26)	-	-
StiIII	**25**		-	-	**21** (20 – 23)	-	-
SgeIV	**75 – 78**	-	63 – 72	66 (65 – 66)	**57** (56 – 58)	53 – 58	53 (52 – 54)
StiIV	**52 – 55**	-	55	52 (51 – 53)	**39** (38 – 39)	43	39 (37 – 40)
StIV	**78 – 83**	-	70 – 80	73 (72 – 74)	**65** (63 – 68)	63 – 68	60 (58 – 63)
Scl	**14 – 15**	-	-	-	Not applicable		
Scw	**10 – 15**	-	-	-			
Fdl	**39 – 40**	-	-	-	**29** (28 – 30)	-	-
No teeth Fd	**9**	-	-	-	**5**	-	-
Mdl	**42 – 43**	-	-	-	**29** (28 – 30)	-	-
No teeth Md	**3**	-	-	-	**2**	-	-
Shaft	Not applicable				**20**	-	-
Toe					**7** (7 – 8)	-	-

Sources of measurements for ♀♀ & ♂♂ – China (cited as *Amblyseius magnus* Wu, junior synonym of *T. volgini* according to Ryu & Ehara 1991): Wu (1987); Russia: Wainstein & Beglyarov (1971); South Korea: Ryu & Ehara (1991); - : not provided.

Z4 short not as long as 2/3 between its base and that of seta *s4*, female ventrianal shield not vase-shaped/divided into separate ventral and anal shield and not wider at the level of anus than at the level of setae *ZV2*. It belongs to the *andersoni* species subgroup of this species group having calyx cup-shaped.

This species is distributed worldwide but is mainly reported from Europe. It has been observed on cultivated plants in orchards (apple, peach, pear and citrus) and vineyards, particularly in humid areas (Chant & Hansell 1971; Papadoulis & Emmanouel 1991; Ivancich-Gambaro 1994; Papaioannou-Souliotis *et al*. 1994; Nicotina 1996; Duso & Pasini 2003; Ragusa 2006). Several studies focused on the biology of *A. andersoni* and on its ability to feed on plant pests. It is reported to feed on *P. ulmi*, *Frankliniella occidentalis* (Pergande) and *Aculops lycopersici* (Massee) (Koveos & Broufas 2000; Fischer and Mourrut-Salesse 2005; Houten *et al*. 2005; Lorenzon *et al*. 2012). This species was already known from Slovenia. With 204 specimens collected in total (see above) in 23 locations, it was one of the most abundant and more widespread species reported in this survey. It has been observed in various locations, probably because of the high relative humidity in these regions.

Amblyseius andersoni was already mentioned from the Slovenian fauna (Miklavc 2006; Bohinc and Trdan 2013; Bohinc *et al.* 2018).

World distribution: Algeria, Austria, Azerbaijan, Canada, Cyprus, Czechoslovakia, Czech Republic, Denmark, England, France, Georgia, Germany, Greece, Hungary, Italy, Japan, Latvia, Moldova, Morocco, Netherlands, Poland, Portugal, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Turkey, Ukraine, USA.

Specimens examined: 135 ♀♀, 33 ♂♂ and 36 immatures in total. Straža pri Raki (aasl 240 m, lat. 45°55’28”N, long. 15°24’26”E), 3 ♀♀ on *Acer pseudoplatanus* L. (Aceraceae), 1 immature on *Capsicum annuum* L. (Solanaceae), 2 ♀♀ on *Vitis vinifera* L. (Vitaceae), 21 ♀♀ and 5 ♂♂ on *Cucumis sativus* L. (Cucurbitaceae) and 1 immature on *Diospyros kaki* Thunberg (Ebenaceae), 19/VI/2018; Ravni (aasl 300 m, lat. 45°56’44”N, long. 15°24’21”E), 1 ♀ on *Prunus cerasus* L. (Rosaceae), 19/VI/2018; Arnovo Selo (aasl 192 m, lat. 47°58’07”N, long. 15°33’49”E), 7 ♀♀, 1 ♂, and 2 immatures on *Malus domestica* Miller (Rosaceae), 1 ♀ on *Rubus fruticosus* L. and 2 ♀♀ on *P. cerasus*, and 14 ♀♀, 1 ♂ and 2 immatures on *Tilia cordata* Miller (Malvaceae), 19/VI/2018; Ljubljana, Hotel Azur (aasl 296 m, 46°02’42”N, 14°28’25”E), 1 ♀ on *M. domestica*, 19/VI/2018 and 8 ♀♀ and 1 immature on *Bambusa vulgaris* Schrader (Poaceae), 21/VI/2018; Bukovica (aasl 49 m, lat. 45°54’06”N, long. 13°39’30”E), 11 ♀♀, 5 ♂♂ and 3 immatures on *P. cerasus* and 1 ♀ on *Ficus carica* L. (Moraceae), 20/VI/2018; Bilje (aasl 72 m, lat. 45°53’60”N, long. 13°38’41”E), 2 ♀♀ on *V. vinifera*, 20/VI/2018; Prvačina (aasl 47 m, lat. 45°53’22”N, long. 13°42’54”E), 2 ♀♀ on *Prunus persica L.* (Rosaceae), 1 ♀ and 1 immature on *M. domestica*, and 4 ♀♀, 1 ♂ and 2 immatures on *Prunus pumila* L. (Rosaceae), 20/VI/2018; Izola-Pivol (aasl 30 m, lat. 45°32’27”N, long. 13°40’51”E), 1 ♀ and 1 immature on *Pyrus communis* L. (Rosaceae) and 1 ♂ on *Juglans regia* L. (Juglandacae), 21/VI/2018; Parecag (aasl 72 m, lat. 45°28’44”N, long. 13°37’49”E), 1 ♀ on *Prunus domestica* L. (Rosaceae), 21/VI/2018; Maribor, Plant Protection Institute (aasl 267 m, lat. 46°34’07”N, long. 15°38’12”E), 4 ♀♀ on *M. domestica* and 4 ♀♀, 2 ♂♂ and 2 immatures on *P. persica,* and 2 ♀♀ on *V. vinifera*, 22/VI/2018; Bukovska vas (aasl 370 m, lat. 46°32’57”N, long. 15°03’01”E), 1 ♀ and 1 ♂ on *Fragaria* sp. (Rosaceae), 12/VII/2018; Škofljica, Gumnišče 15 (aasl 305 m, lat. 45°58’15”N, long. 14°34’17”E), 1 ♀ and 1 ♂ on *Acer campestre* L. (Aceraceae), 18/VI/2019; Ljubljana, Biotechnical Faculty (aasl 307 m, 46°02’54”N, 14°28’32”E), 1 ♂ on *Cornus mas* L. (Cornaceae), 18/VI/2019; Ljubljana, Hotel Katrca (aasl 307 m, 46°3’19”N, 14°20’26”E), 1 ♀ on *Carpinus betulus* L. (Betulaceae), 18/VI/2019, and 1 ♀ on *Tilia platyphyllos* Scopoli (Malvaceae), 22/VI/2019; Sečovlje, 58a (aasl 3 m, lat. 45°28’43”N, long. 13°37’28”E), 2 ♀♀ on *J. regia* and on *Cornus sanguinea* L. (Cornaceae), 19/VI/2019; Dragonja (aasl 3 m, lat. 45°27’32”N, long. 13°39’04”E), 3 ♀♀ on *V. vinifera*, 2 ♀♀ and 1 immature on *P. pumila*, and 1 ♂ on *F. carica*, 19/VI/2019; Bertoki (aasl 28 m, lat. 45°32’55”N, long. 13°47’13”E), 1 ♀ on *Actinidia deliciosa* (A. Chevalier) C.F. Liang & A.R. Ferguson (Actinidiaceae), 19/VI/2019; Pragersko, Kvedrova ulica (aasl 250 m, 46°23’48”N, 13°40’11”E), 2 ♀♀ and 1 ♂ on *Pinus*

strobus L. and 2 ♀♀ and 1 ♂ on *P. sylvestris* L. (Pinaceae), 20/VI/2019; Juršinci, Gabrnik 55 (aasl 301 m, lat. 46°28'43"N, long. 15°58'2"E), 1 ♀ and 1 immature on *Rubus tomentosus* Borkhausen (Rosaceae), 20/VI/2019; Veržej, Near the football stadium (aasl 182 m, lat. 46°35'27"N, long. 16°10'1"E), 2 ♀♀, 1 ♂ and 1 immature on *Ulmus minor* Miller (Ulmaceae) and 2 ♀♀ on *Quercus robur* L. (Fagaceae), 20/VI/2019; Šobec (aasl 418 m, lat. 46°21'22"N, long. 14°9'2"E), 2 ♂♂ and 2 immatures on *P. sylvestris,* 6 ♀♀, 6 ♂♂ and 4 immatures on *Q. robur*, 1 ♀ on *Picea abies* (L.) H. Karsten (Pinaceae), 1 ♀ and 5 immatures on *Aesculus hippocastanum* L. (Hippocastanaceae), 1 ♀ on *Prunus padus* L. (Rosaceae), 1 ♀ and 1 ♂ on *J. regia* and 2 ♀♀ on *Fraxinus excelsior* L. (Oleaceae), 21/VI/2019; Kranj (aasl 434 m, 46°16'6"N, 14°20'26"E), 2 ♀♀, 1 ♂ and 3 immatures on *P. abies* and 4 immatures on *Sambucus nigra* L. (Adoxaceae), 21/VI/2019; Spodnje Škofije-Purissima (aasl 50 m, lat. 45°34'21"N, long. 13°46'31"E), 4 ♀♀ and 1 ♂ on *Capsicum annuum* L. (Solanaceae), 11/VII/2019.

Remarks: The description and measurements of the adult females collected agree with those provided by Chant and Yoshida (1990), by Ferragut *et al.* (2010) for specimens from Spain and by Doker *et al.* (2019) for specimens from Bosnia-Herzegovina, a close country of Slovenia.

Amblyseius microorientalis Wainstein & Beglyarov

Amblyseius microorientalis Wainstein & Beglyarov 1971: 1808.
Amblyseius (*Amblyseius*) *microorientalis*, Wainstein 1979: 141.
Amblyseius (*Multiseius*) *microorientalis*, Denmark & Muma 1989: 113. Moraes *et al.* 1986: 22; 2004: 38.
Amblyseius microorientalis, Chant & McMurtry 2004a: 201; 2007: 80.

Like the previous species, *A. microorientalis* belongs to the *obtusus* species group of the genus *Amblyseius* but having the calyx of the spermatheca long and saccular, it belongs to the *nicola* species subgroup.

The biology of that species is totally unknown.

This is the first report of that species from Slovenia.

World distribution: Russia.

Specimens examined: 3 ♀♀ and 1 ♂ in total. Veržej, Near the football stadium (aasl 182 m, lat. 46°35'27"N, long. 16°10'1"E), 3 ♀♀ and 1 ♂ on *Fraxinus excelsior* L. (Oleaceae), 20/VI/2019.

Remarks: The description and measurements of the three adult females (Table 4) collected agree well with those provided by Wainstein and Beglyarov (1971) and by Denmark and Muma (1989) for specimens from Russia with some slightly longer setae (*j1, Z4*, *Z5*, *JV5*, *SgeIV* and *StiIV*) in the Slovenian specimens. The male of that species is unknown and the description of the single specimen male collected is provided thereunder.

Description of the adult male of *Amblyseius microorientalis* Wainstein & Beglyarov

(n = 1) (Figs 1 a – d)

Diagnosis — The following combination of characters indicated below in the description of the male of this species is quite similar to the few described males of species of *Amblyseius* belonging to the *obtusus* species group and to the *nicola* species subgroup. Not many characters allow to distinguish it from all males of other species if no females are collected in the same time: the peritreme reaching the level of setae *j1*, an absence of reticulation of the dorsal shield, some dorsal setae length, especially *z2*, *z4*, *r3* and *S2* approximately of the same length (12 – 15) and *s4* = *Z4* (60), a spermatodactyl with a terminal part elongate with a large open angle with the shaft, additional macrosetae on all other legs than the leg IV, macrosetae of the leg IV subequal, a large sternogenital shield reticulated on margins, only three pairs of preanal setae, one pair of crateriform *gv3* in-between and very close to setae *JV2*. All described males [*Amblyseius articus* Chant and Hansell, *A. indocalami* Zhu and Chen, *A. longisaccatus* Wu and Lin, *Amblyseius obtusus* (Koch), *A. pseudoorientalis* Chinniah and Mohanasundaram, *A.*

tubae Karg, *A. valpoensis* Gonzalez and Schuster)] have similar ventrianal shield reticulated with 3 pairs of preanal setae but the shaft and toe are quite different. The closest species is *A. indocalami* but shaft and toe are shorter and the angle between shaft and toe is less open. All other species have shaft and toe with an angle close to 90°.

Dorsum — (Fig. 1a). Dorsal shield fused with the peritremal shield at the level of *z2 – z4* position, with no reticulations, 268 long and 158 wide, with eight pairs of solenostomes (*gd 1, 2, 3, 4, 5, 6, 8, 9*) and 10 pairs of poroids. The dorsal shield bears 17 pairs of dorsal setae and 2 pairs of sub-lateral setae on the dorsal shield: *j1* 24, *j3* 45, *j4* 8, *j5* 5, *j6* 8, *J2* 8, *J5* 5, *z2* 13, *z4* 15, *z5* 6, *Z1* 8, *Z4* 60, *Z5* 137, *s4* 60, *S2* 12, *S4* 10, *S5* 10, *r3* 14, *R1* 8. All setae smooth except *Z4* and *Z5* serrated.

Peritreme — (Fig. 1a). Extending to the level of *j1*. Peritremal shield fused with dorsal shield.

Venter — (Fig. 1b). Sternal shield smooth except on edges which are reticulated. Distances between *st1 – st1* 50, *st2 – st2* 58, *st3 – st3* 58, *st1 – st5* 113, *st4 – st4* 45, *st5 – st5* 33. Ventrianal shield with three pairs of pre-anal setae, *JV1*, *JV2*, and *ZV2*, and one pair crateriform *gv3*, between *JV2* but very close from these setae, 20 between *gv3* (distance between centers of solenostomes). One pair of *iv5* and four pairs of poroids *ivo* discernible on the unique specimen examined. Soft cuticle surrounding ventrianal shield with one pair of setae (*JV5*); ventrianal

Table 4 Character measurements of adult females of *Amblyseius microorientalis* collected in this study with those in previous studies (localities followed by the number of specimens measured between brackets).

Characters	Slovenia (3) (this study)	Russia 1 (4)	Russia 2 (1)	Characters	Slovenia (3) (this study)	Russia 1 (4)	Russia 2 (1)
Dsl	**360** (355 – 368)	335	336	Gensl	**115** (105 – 125)	-	-
Dsw *s4*	**203** (200 – 208)	200	188	*st5-st5*	**67** (65 – 68)	-	-
j1	**31**	18	27	Gensw post.corn.	**75** (68 – 83)	-	-
j3	**48**	43	45	Lisl	**23** (20 – 25)	-	-
j4	**8** (7 – 8)	5	5	Lisw	**6** (5 – 8)	-	-
j5	**5** (5 – 6)	4	5	Sisl	**14** (13 – 15)	-	-
j6	**7** (6 – 8)	5	5	Sisw	**3** (2 – 3)		
J2	**9** (8 – 9)	9	5	Vsl	**122** (120 – 125)	-	-
J5	**7** (6 – 7)	5	7	Vsw *ZV2*	**91** (90 – 93)	-	-
r3	**19** (18 – 20)	-	22	Vsw anus	**79** (75 – 83)	-	-
R1	**12** (12 – 13)	-	11	Dist. *gv3*	**27** (25 – 28)	-	-
s4	**68** (65 – 70)	58	69	*JV5*	**64** (63 – 65)	60	-
S2	**14**	12	13	*SgeI*	**39** (38 – 40)	-	-
S4	**11** (10 – 13)	9	12	*SgeII*	**34** (33 – 35)	-	-
S5	**12** (10 – 13)	9	11	*SgeIII*	**43**	-	-
z2	**18** (17 – 18)	14	17	*StiIII*	**31** (30 – 33)	-	-
z4	**19** (18 – 21)	18	21	*SgeIV*	**91** (85 – 95)	75	72
z5	**6** (5 – 6)	5	5	*StiIV*	**71** (68 – 75)	55	59
Z1	**10** (9 – 11)	9	8	*StIV*	**67** (65 – 68)	65	65
Z4	**76** (75 – 76)	72	72	Scl	**17** (15 – 18)	-	18
Z5	**178** (170 – 183)	162	160	Scw	**3**	-	-
st1-st1	**62** (60 – 63)	-	-	Fdl	**33** (33 – 34)	-	-
st2-st2	**71** (70 – 73)	-	-	No teeth Fd	**11**	-	10
st3-st3	**81** (80 – 83)	-	-	Mdl	**33** (33 – 34)	-	-
st1-st3	**66** (63 – 68)	-	-	No teeth Md	**3**	-	2
st4-st4	**84** (83 – 85)	-	-				

Sources of measurements – Russia 1: Wainstein & Beglyarov (1971); Russia 2: Denmark & Muma (1989) for the holotype; - : not provided.

shield 114 long, 153 wide at anterior corners and 65 wide at level of paranal setae. *JV5* smooth, 43 long. A pair of lyrifissures *ivp* near *JV5*.

Chelicera — Fixed digit 23 long, with 8-9 teeth and movable digit 23 long with 1-2 teeth. Spermatodactyl elongate, with an elongate shaft (Fig. 1c) 25 long, and an elongate toe 13 with a large open angle between them, which makes the toe almost in alignment with the shaft.

Legs — (Fig. 1d). Legs IV with three pointed macrosetae like in the female: *SgeI* 33, *SgeII* 28, *SgeIII* 31, *StiIII* 28, *SgeIV* 58, *StiIV* 50, *StIV* 55. Chaetotactic formula of genu II and III similar to that of females.

Specimens examined — 1 ♂ collected, 1 ♂ measured. Veržej, Near the football stadium (aasl 182 m, lat. 46°35'27"N, long. 16°10'1"E), 1 ♂ on *Fraxinus excelsior* L. (Oleaceae), 20/VI/2019.

Type material — One male on one slide deposited in Montpellier SupAgro–INRA Acarology collection.

Remarks — Characters of males are very similar to that of females except of course length of setae and other characters. Ventrianal shield of the male is strongly reticulated and the ventrianal shield of the female not or very slightly, the sternogenital shield is larger in the male at the level of the seta *st2*, of normal size and not larger in the female. The male has also less teeth in FD and MD than female has.

Amblyseius rademacheri Dosse

Amblyseius rademacheri Dosse 1958: 44; Chant & McMurtry 2004a: 201; 2007: 81.
Typhlodromus (*Amblyseius*) *rademacheri*, Chant 1959: 89.
Amblyseius (*Typhlodromopsis*) *rademacheri*, Muma 1961: 287.
Typhlodromus rademacheri, Hirschmann 1962: 229.
Typhlodromus (*Typhlodromus*) *rademacheri*, Westerboer & Bernhard 1963: 658.
Amblyseius (*Amblyseius*) *rademacheri*, Ehara 1966: 23.
Amblyseius (Typhlodromips) rademacheri, Karg 1971: 185.
Typhlodromips rademacheri, Moraes *et al.* 1986: 145; Moraes *et al.* 2004: 221.
Amblyseius (*Neoseiulus*) *rademacheri*, Ehara & Amano 1998: 31.
Amblyseius khnzoriani Wainstein & Arutunjan 1970: 1498 (synonymy according to Wainstein 1975).

This species belongs to the same species group and the same species subgroup as *A. andersoni*.

Amblyseius rademacheri was found together with *T. urticae* on *S. melongena* in Turkey (Soysal and Akyazi 2018). In previous studies, it was found on various fruits, weeds, forest trees in association with tetranychid and eriophyid mites (Hajizadeh 2007). Tixier *et al.* (2013) also reported *A. rademacheri* on *Vitis vinifera*. Komi *et al.* (2008) found this species on pepper and eggplant in Japan. However, despite these records on cultivated plants, the biology of that species is unknown.

Amblyseius rademacheri was already mentioned from the Slovenian fauna (Miklavc 2006; Bohinc and Trdan 2013).

World distribution: Armenia, Austria, Azerbaijan, China, Czechoslovakia, Denmark, Georgia, Germany, Hungary, Iran, Italy, Japan, Latvia, Moldova, Netherlands, Poland, Russia, Slovakia, Slovenia, South Korea, Spain, Switzerland, Ukraine.

Specimens examined: 6 ♀♀ and 2 immatures in total. Straža pri Raki (aasl 240 m, lat. 45°55'28"N, long. 15°24'26"E), 3 ♀♀ on *Acer pseudoplatanus* L. (Aceraceae), 6 ♀♀, 2 ♂♂ and 2 immatures on *Cucumis sativus* L. (Cucurbitaceae) and 1 immature on *Diospyros kaki* Thunberg (Ebenaceae), 19/VI/2018; Škofljica, Gumnišče 15 (aasl 305 m, lat. 45°58'15"N, long. 14°34'17"E), 1 ♀ and 1 immature on *Rubus fruticosus* L. (Rosaceae), 18/VI/2019; Juršinci, Gabrnik 55 (aasl 301 m, lat. 46°28'43"N, long. 15°58'2"E), 1 ♀ on *Prunus cerasus* L. and 1 ♀ on *Pyrus communis* L. (Rosaceae), 20/VI/2019; Kranj (434 m, lat. 46°16'6"N, long.

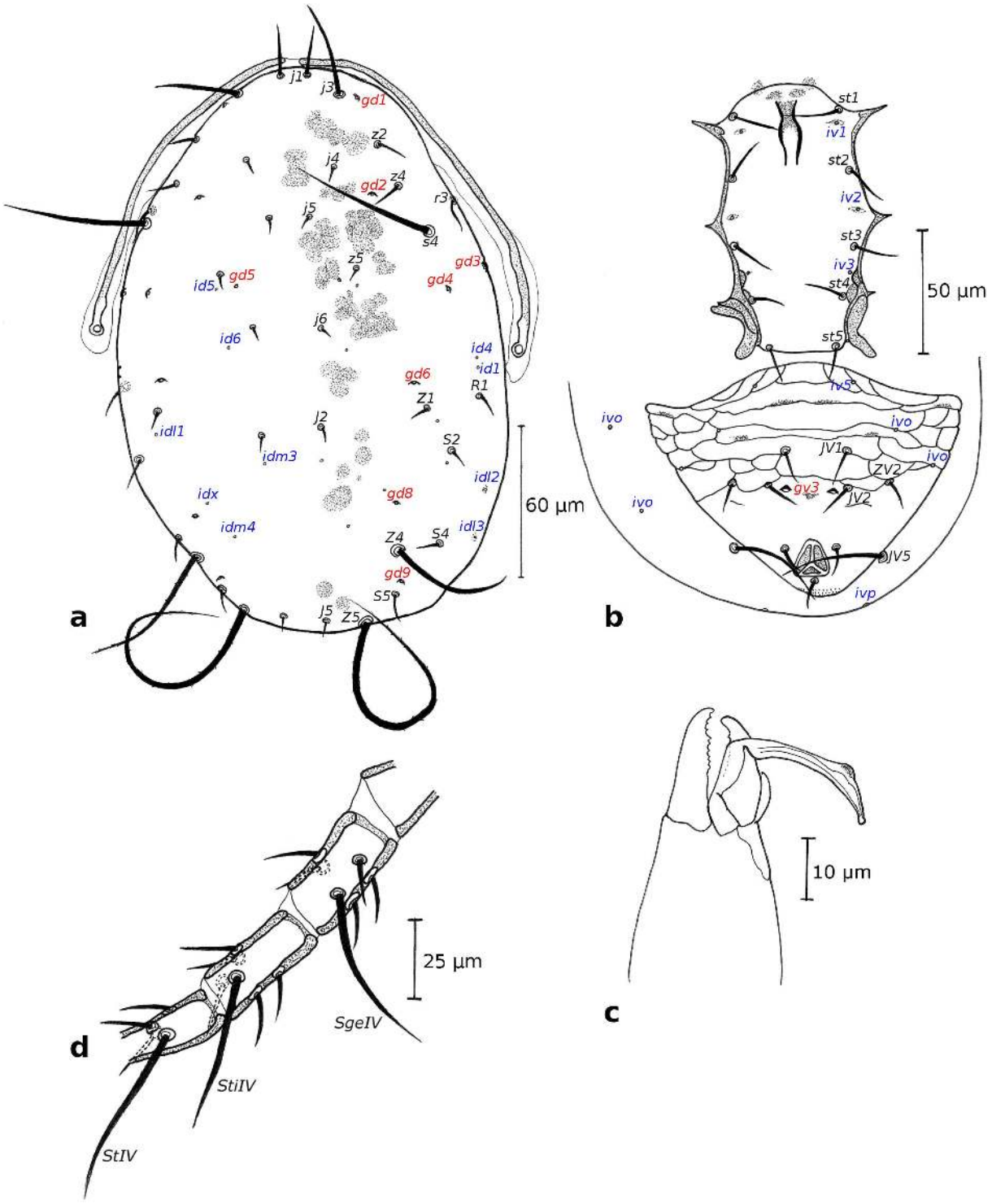

Figure 1 Male of *Amblyseius microorientalis* Wainstein and Beglyarov. a – Dorsal shield and peritreme; b – Ventral shields; c – Chelicera and spermatodactyl, d – Macrosetae on leg IV.

14°20’26”E), 2 ♀♀ and 1 immature on *Urtica dioica* L. (Urticaceae) and 1 ♀ on *Cornus mas* L. (Cornaceae), 21/VI/2019.

Remarks: The description and measurements of the adult females collected agree with those provided by Ryu and Ehara (1992), Kolodochka and Gwiazdowicz (2016) and Ferragut *et al.* (2010) for specimens from Spain.

Amblyseius swirskii Athias-Henriot

Amblyseius swirskii Athias-Henriot 1962: 5.
Amblyseius (*Amblyseius*) *swirskii*, Ehara 1966: 23.
Typhlodromips swirskii, Moraes *et al.* 1986: 149; 2004: 227.
Amblyseius swirskii, Chant & McMurtry 2004a: 201; 2007: 81.
Amblyseius capsicum (Basha, Yousef, Ibrahim & Mostafa) (synonymy according to Abo-Shnaf & Moraes 2014).
Amblyseius enab El-Badry ((synonymy according to Abo-Shnaf & Moraes 2014).
Amblyseius rykei Pritchard & Baker 1962: 249 (synonymy according to Zannou & Hanna 2011).

Like the previous species, *A. swirskii* belongs to the same species group and the same species subgroup as *A. andersoni*.

The predatory mite *A. swirskii* is one of the most efficient Phytoseidae; it is currently released in more than 50 countries of the world. It originates from the East Mediterranean coast and has been described in 1962 from almond [*Prunus dulcis* (Mill.) D.A.Webb.] in Bet Dagan, Israel by Athias-Henriot (1962). This species was then reported along the coast of Israel, Middle Eastern countries, Southern Europe, Sub-Saharan Africa and the America (Demite *et al.* 2020).

This species is able to develop not only in the Mediterranean basin but also in subtropical and tropical areas (Zannou and Hanna 2011). Since this species is not entering diapause, it can be used throughout much of the season where daytime temperatures regularly exceed 22 °C (Calvo *et al.* 2015). *A. swirskii* is commonly used to control whiteflies and thrips in greenhouse vegetables (especially cucumber, pepper and eggplant) and some ornamental crops, in Europe and North America (Calvo *et al.* 2015). The biology of this species and its importance for biocontrol were recently reviewed by Calvo *et al.* (2015) and Buitenhuis *et al.* (2015).

This is the first record of that species in Slovenia, probably originating from dispersion in the environment after greenhouse releases.

World distribution: Argentina, Azerbaijan, Benin, Burundi, Cape Verde, Dr Congo, Egypt, Gaza Strip, Georgia, Ghana, Israel, Italy, Kenya, La Réunion Island, Saudi Arabia, Senegal, Spain, Syria, Tanzania, Turkey, USA, Yemen.

Specimens examined: 1 ♀ and 1 immature in total. Spodnje Škofije-Purissima (aasl 50 m, lat. 45°34’21”N, long. 13°46’31”E), 1 ♀ and 1immature on *Capsicum annuum* L. (Solanaceae), 11/VII/2019.

Remarks: The description and measurements of the adult females collected agree with those provided by Ferragut *et al.* (2010) for specimens from Spain and by Kreiter *et al.* (2016a, b) for specimens from La Réunion and from various countries in the world.

Sub-tribe Proprioseiopsina Chant & McMurtry

Proprioseiopsina Chant & McMurtry, 2004a: 219.

Genus *Proprioseiopsis* Muma

Proprioseiopsis Muma, 1961: 277.

Proprioseiopsis bordjelaini Athias-Henriot

Amblyseius bordjelaini Athias-Henriot 1966: 193.
Amblyseius (*Amblyseius*) *bordjelaini*, Ueckermann & Loots 1988: 67.
Proprioseiopsis bordjelaini, Chant & McMurtry 2005a: 11; 2007: 89.

This species is mentioned as an uncertain species by Chant and McMurtry (2005a) having an uncertain identity because of incomplete description. This species is quite rare and has been only reported from the Mediterranean basin and Canary Islands. The biology of that species is totally unknown.

This is the first report of that species from Slovenia.

World distribution: Algeria, Canary Islands, Morocco, Spain, Tunisia.

Specimens examined: A single ♀ during the two years-study. Straža pri Raki (aasl 240 m, lat. 45°55'28"N, long. 15°24'26"E), 1 ♀ on *Cucumis sativus* L. (Cucurbitaceae), 19/VI/2018.

Remarks: The description and measurements of the adult females collected agree with those provided by Ferragut *et al.* (2010) for specimens from Spain (Table 5).

Proprioseiopsis okanagensis (Chant)

Typhlodromus okanagensis Chant 1957: 293.
Proprioseiopsis okanagensis, Chant & McMurtry 2005a: 15: 2007: 89.
Proprioseiopsis levis Wainstein 1960: 686 (synonymy according to Karg 1971b).

Oppositely to the case of the previous species, *P. okanagensis* belongs to the *belizensis* species group of the genus *Proprioseiopsis* having macrosetae on genu I and to the *belizensis*

Table 5 Comparison of character measurements of adult females of *Proprioseiopsis bordjelaini* collected in this study with those in previous studies (localities followed by the number of specimens measured between brackets).

Characters	Slovenia (1) (this study)	Algeria (2)	Spain (?)	Characters	Slovenia (1) (this study)	Algeria (2)	Spain (?)
Dsl	**358**	408 – 435	402 – 436	Gensl	**125**	-	-
Dsw *s4*	**250**	-	250 – 278	*st5-st5*	**90**	102 – 108	-
j1	**33**	32 – 35	33 – 36	Gensw post.corn.	**100**	-	-
j3	**53**	53 – 56	56 – 62	Lisl	**23**	-	-
j4	**3**	-	5	Lisw	**6**	-	-
j5	**5**	-	4 – 6	Sisl	**10**	-	-
j6	**7**	-	6 – 8	Sisw	**3**		
J5	**11**	-	14	Vsl	**110**	140 – 147	124 – 139
r3	**23**	25 – 28	24 – 28	Vsw *ZV2*	**120**	142 – 147	128 – 140
R1	**8**	-	11 – 13	Vsw anus	**70**	-	-
s4	**100**	90 – 102	109 – 124	*JV5*	**80**	80 – 100	-
S2	**8**	-	8 – 12	*SgeIV*		-	92 – 108
S4	**8**	-	10 – 13	*StiIV*		60 – 70	73 – 87
S5	**18**	-	13 – 17	*StIV*		73 – 77	72 – 83
z2	**31**	24	38 – 44	Scl	**20**	-	-
z4	**10**	-	18	Scw	**10**	-	-
z5	**4**	-	4 – 6	Fdl	**33**	-	-
Z1	**5**	-	8	No teeth Fd	-	-	-
Z4	**138**	125 – 127	132 – 140	Mdl	**33**	-	-
Z5	**198**	203 – 225	196 – 216	No teeth Md	-	-	-
st1-st1	**55**	-	-				
st2-st2	**74**	-	-				
st3-st3	**83**	97 – 102	-				
st1-st3	**68**	68 – 70	-				
st4-st4	**80**	-	-				

Sources of measurements – Algeria: Athias-Henriot (1966); Spain: Ferragut *et al.* (2010); - : not provided.

species subgroup having a calyx of the spermatheca bell-shaped. The biology of that species is totally unknown.

This is the first report of that species from Slovenia.

World distribution: Austria, Azerbaijan, Canada, China, Czech Republic, Finland, Germany, Greenland, Latvia, Moldova, Norway, Poland, Russia, Slovakia, Sweden, Turkey, Ukraine, USA.

Specimens examined: A single ♀ during the two years-study. Juršinci, Gabrnik 55 (aasl 301 m, lat. 46°28'43"N, long. 15°58'2"E), 1 ♀ on *Prunus cerasus* L. (Rosaceae), 20/VI/2019.

Remarks: The measurements of the adult female collected agree with those provided by Chant (1957) in the original description.

Tribe Euseiini Chant & McMurtry

Euseiini Chant & McMurtry 2005b: 191.

Sub-tribe Typhlodromalina Chant & McMurtry

Typhlodromalina Chant & McMurtry 2005b: 195.

Genus *Amblydromalus* Chant & McMurtry

Amblydromalus Chant & McMurtry, 2005b: 203; 2007: 117.

Amblydromalus limonicus (Garman & McGregor)

Amblyseius limonicus Garman & McGregor 1956: 11.
Amblyseiopsis limonicus, Garman 1958: 72.
Tyohlodromus (*Amblyseius*) *limonicus*, Chant 1959: 96.
Amblyseius (*Typhlodromalus*) *limonicus*, Muma 1961: 288.
Amblyseius (*Amblyseius*) *limonicus*, Wainstein 1962: 15.
Typhlodromalus limonicus De Leon, 1967: 22.
Amblydromalus limonicus, Chant & McMurtry 2005b: 207; 2007: 117.
Amblydromalus garmani Chant 1959: 81 (unjustified replacement name for *Amblydromalus limonicus* according to Chant 1959).
Typhlodromus (*Amblyseius*) *garmani* Chant 1959: 81 (objective synonymy according to Moraes *et al*. 1986: 131; 2004: 199).
Amblyseius (*Typhlodromalus*) *rapax* De Leon 1965: 125 (synonymy according to Moraes *et al*. 1982)

This species belongs to the *limonicus* species group as seta *Z4* is much shorter than 40 % of the distance between its base and that of seta *Z5*.

Amblydromalus limonicus was described in 1956 from citrus in California. Its distribution range covers North and South America, Australia and New Zealand. It was detected for the first time in 2011 on tomatoes in several locations of the northeastern Spain and has extended its area of distribution since this date (Chorazy *et al.* 2016). It first caught the attention as natural enemy of the spider mites *Oligonychus punicae* (Hirst) and *T. urticae* in avocados and other fruit trees (Knapp *et al.* 2013). In laboratory studies, *A. limonicus* developed into adults and laid eggs on several species of mites, thrips, whiteflies and scale insects, as well as on pollen (Knapp *et al.* 2013). Interest into *A. limonicus* re-emerged in the early 1990s after *F. occidentalis* had spread nearly all over the world. It was collected during surveys for *F. occidentalis* biocontrol agents in New Zealand and Australia. Laboratory and semi-field experiments in the Netherlands and Australia showed that *A. limonicus* was a very promising candidate for biological control of *F. occidentalis* in several greenhouse crops (Knapp *et al.* 2013). However, it was not possible to establish a commercially viable mass rearing system at this time. At around the same time *A. limonicus* was also identified in surveys in South America

for classical biocontrol agents for the cassava green mite, *Mononychellus tanajoa* (Bondar). Recently, a mass production system for *A. limonicus* was developed and this species became commercially available in January 2012. With the material from this mass production system, more semi-field and field trials could be conducted. Results showed that *A. limonicus* is also an excellent biocontrol agent for greenhouse whiteflies *Trialeurodes vaporariorum* (Westwood) in various ornamental and vegetable greenhouse crops. As this predatory mite originates from temperate areas, it is a good complement to *A. swirskii* and *Transeius montdorensis* (Schicha). Both species originate from sub-tropical regions and have a higher optimum temperature than *A. limonicus*. This is the first record of that species in Slovenia, probably originating from dispersion in the environment after greenhouse releases.

World distribution: Bolivia, Brazil, Colombia, Costa Rica, Cuba, Ecuador, French Guiana, Guatemala, Guyana, Hawaii, Honduras, Jamaica, Mexico, New Zealand, Nicaragua, Puerto Rico, Spain, Suriname, Trinidad, USA, Venezuela.

Specimens examined: 2 ♀♀ in total. Sečovlje, 58a (aasl 3 m, lat. 45°28'43"N, long. 13°37'28"E), 2 ♀♀ on *Cucurbita pepo* L. (Cucurbitaceae), 19/VI/2019.

Remarks: The description and measurements of the adult females collected agree with those provided by Moraes and McMurtry (1983) and by Moraes *et al.* (1994).

Subtribe Euseiina Chant & McMurtry

Euseiina Chant & McMurtry, 2005b: 209.

Genus *Euseius* Wainstein

Amblyseius (*Amblyseius*) section *Euseius*, Wainstein, 1962: 15; *Euseius* De Leon, 1967: 86.

Euseius finlandicus (Oudemans)

Seiulus finlandicus Oudemans 1915: 183.
Typhlodromus finlandicus, Oudemans 1930a: 50.
Typhlodromus (*Typhlodromus*) *finlandicus*, Cunlife & Baker 1953: 19.
Amblyseius finlandicus, Athias-Henriot 1958: 34.
Typhlodromus (*Amblyseius*) *finlandicus*, Chant 1959: 67.
Typhlodromus (*Typhlodromopsis*) *finlandicus*, De Leon 1959: 113.
Amblyseius (*Typhlodromalus*) *finlandicus*, Muma 1961: 288.
Amblyseius (*Amblyseius*) *finlandicus*, Wainstein 1962: 15.
Amblyseius (*Euseius*) *finlandicus*, Arutunjan 1970: 11.
Euseius finlandicus, Karg 1971: 178; Moraes *et al.* 1986: 41, 2004: 66; Chant & McMurtry 2005b: 215; 2007: 118.
Typhlodromus pruni Oudemans 1929: 32 (synonymy according to Yoshida-Shaul & Chant 1995a).

Euseius finlandicus has been reported in orchards and grapevines in various countries in Europe. This species is widespread, mainly in the Palaearctic region. It feeds on *P ulmi* and various eriophyid mites. It is a type IV predatory mite with its highest reproductive capacity reached when feeding on pollen (McMurtry and Croft 1997; Broufas and Koveos 2000; McMurtry *et al.* 2013).

This species was already known from Slovenia (Miklavc 2006; Bohinc and Trdan 2013; Bohinc *et al.* 2018). With 375 specimens in total in 21 locations, it is one of the more common and widespread in that survey.

World distribution: Albania, Algeria, Angola, Argentina, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Canada, Caucasus Region, China, Croatia, Cyprus, Czechoslovakia, Czech Republic, Denmark, England, Finland, France, Georgia, Germany, Greece, Hungary, India, Indonesia, Iran, Italy, Japan, Kazakhstan, Latvia, Lithuania, Macedonia, Mexico, Moldova, Montenegro, Netherlands, Nicaragua, Norway,

Poland, Portugal, Russia, Scandinavia, Serbia, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Tunisia, Turkey, Ukraine, USA.

Specimens examined: 234 ♀♀, 61 ♂♂ and 80 immatures in total. Straža pri Raki (aasl 240 m, lat. 45°55'28"N, long. 15°24'26"E), 1 ♀ on *Vitis vinifera* L. (Vitaceae), 19/VI/2018; Ravni (aasl 300 m, lat. 45°56'44"N, long. 15°24'21"E), 4 ♀♀ on *Prunus cerasus* L. (Rosaceae), 19/VI/2018; Arnovo Selo (aasl 192 m, lat. 47°58'07"N, long. 15°33'49"E), 4 ♀♀ on *P. cerasus* and 24 ♀♀, 5 ♂♂ and 6 immature on *Rubus fruticosus* L. (Rosaceae), 2 ♀♀ and 1 ♂ on *Juglans regia* L. (Juglandaceae) and 10 ♀♀, 1 ♂ and 1 immature on *Tilia cordata* Miller (Malvaceae), 19/VI/2018; Ljubljana, Hotel Azur (aasl 296 m, 46°02'42"N, 14°28'25"E), 10 ♀♀, 4 ♂♂ and 2 immatures on *T. cordata*, 13 ♀♀, 2 ♂♂ and 1 immature on *Acer pseudoplatanus* L. (Aceraceae), 3 ♀♀ and 2 ♂♂ on *Malus domestica* L. (Rosaceae), 19/VI/2018 and 11 ♀♀ and 1 ♂ on *Aesculus hippocastanum* L. (Hippocastaneaceae), 22/VI/2018; Bukovica (aasl 49 m, lat. 45°54'06"N, long. 13°39'30"E), 4 ♀♀ and 1 ♂ on *P. cerasus* and 1 immature on *Ziziphus jujuba* Miller (Rhamnaceae), 20/VI/2018; Izola-Pivol (aasl 30 m, lat. 45°32'27"N, long. 13°40'51"E), 4 ♀♀ on *P. cerasus*, 7 ♀♀, 4 ♂♂ and 1 immature on *J. regia*, 21/VI/2018; Parecag (aasl 72 m, lat. 45°28'44"N, long. 13°37'49"E), 34 ♀♀, 2 ♂♂ and 2 immatures on *P. cerasus*, 21/VI/2018; Pesnica (aasl 256 m, lat. 46°37'02"N, long. 15°40'58"E), 8 ♀♀, 6 ♂♂ and and 14 immatures on *M. domestica*, 22/VI/2018; Ljubljana, Parc Tivoli (aasl 300 m, 46°03'16"N, 14°29'49"E), 2 ♀♀, 1 ♂ and 1 immature on *Carpinus betulus* L. (Betulaceae) and 1 immature on *Quercus robur* L. (Fagaceae), 22/IV/2018; Ljubljana, Botanical garden (aasl 293 m, 46°02'02"N, 14°30'51"E), 10 ♀♀, 1 ♂ and 1 immature on *Celtis australis* L. (Cannabaceae), 22/VI/2018; Ljubljana, Biotechnical Faculty (aasl 307 m, 46°02'54"N, 14°28'32"E), 1 ♀ and 1 ♂ on *Cornus mas* L. (Cornaceae), 18/VI/2019; Sečovlje, 58a (aasl 3 m, lat. 45°28'43"N, long. 13°37'28"E), 3 ♀♀ and 2 immatures on *J. regia* and 16 ♀♀, 3 ♂♂ and 13 immatures on *A. hippocastanum*, 19/VI/2019; Dragonja (aasl 3 m, lat. 45°27'32"N, long. 13°39'04"E), 1 ♂ and 2 immatures on *M. domestica* and 1 ♀ on *Prunus pumila* L. (Rosaceae), and 3 ♀♀ and 2 immatures on *Diospyros kaki* Thunberg (Ebenaceae), 19/VI/2019; Bertoki (aasl 28 m, lat. 45°32'55"N, long. 13°47'13"E), 1 ♂ and 2 immatures on *Prunus persica* L. (Rosaceae) and 1 ♀ on *Actinidia deliciosa* (A. Chevalier) C.F. Liang & A.R. Ferguson (Actinidiaceae), 19/VI/2019; Pragersko, Kvedrova ulica (aasl 250 m, 46°23'48"N, 13°40'11"E), 1 immature on *Populus tremula* L. (Salicaceae), 20/VI/2019; Juršinci, Gabrnik 55 (aasl 301 m, lat. 46°28'43"N, long. 15°58'2"E), 6 ♀♀, 1 ♂ and 2 immatures on *M. domestica* and 1 ♀ on *P. persica*, 20/VI/2019; Veržej, Kasač Restaurant (aasl 182 m, lat. 46°34'44"N, long. 16°09'45"E), 5 ♀♀, 4 ♂♂ and 3 immatures on *A. pseudoplatanus* L. (Aceraceae) and 1 ♂ and 1 immature on *T. cordata*, 20/VI/2019; Veržej, Near the football stadium (aasl 182 m, lat. 46°35'27"N, long. 16°10'1"E), 1 ♂ + 2 immatures on *Quercus sessiliflora* (Mattuschka) Lieblein and 22 ♀♀, 2 ♂♂ and 5 immatures on *Q. robur* L. (Fagaceae) and 2 ♀♀, 1 ♂ and 1 immature on *Fraxinus excelsior* L. (Oleaceae), 20/VI/2019; Bled, Lake (aasl 478 m, lat. 46°22'4"N, long. 14°05'06"E), 1 ♀ and 1 ♂ on *Alnus glutinosa* (L.) Gaertner (Betulaceae), 10 ♀♀, 8 ♂♂ and 5 immatures on *A. pseudoplatanus* and 3 ♀♀, 1 ♂ and 2 immatures on *Ulmus minor* L. (Ulmaceae), 21/VI/2019; Kranj (aasl 434 m, 46°16'6"N, 14°20'26"E), 1 ♀ on *C. mas*, 4 ♀♀, 2 ♂♂ and 3 immatures on *C. betulus*, 1 ♀ and 2 immatures on *Picea abies* (L.) H. Karsten (Pinaceae) and 1 ♂ and 2 immatures on *Sorbus aucuparia* L. (Rosacae), 21/VI/2019; Ljubljana, Hotel Katrca (aasl 307 m, 46°3'19"N, 14°20'26"E), 2 ♀♀ and 1 ♂ on *Tilia platyphyllos* Scopoli (Malvaceae), 22/VI/2019.

Remarks: The measurements of the adult females collected agree with those provided by Ferragut and Escudero (1997) and Ferragut *et al.* (2010) for specimens from Spain.

Euseius gallicus Kreiter & Tixier

Euseius gallicus Kreiter & Tixier, in Tixier *et al.* (2010d): 242.

Euseius gallicus is a phytoseiid species described from southern France (Tixier *et al.* 2010). It has also been recorded from Tunisia, Belgium, Germany, the Netherlands, and Turkey (Kreiter *et al.* 2010; Döker *et al.* 2014).

Unlike the phytoseiid species mentioned above, which are classified as generalist predators of small insects and mites (type III), *Euseius* species are pollen-feeding generalist predators (type IV) (McMurtry and Croft 1997; McMurtry *et al.* 2013). Type III phytoseiids also feed on pollen but prefer or show better performance on insect or mite prey. Type IV predatory mites have their highest reproductive capacity when feeding on pollen, and populations in the field often increase significantly when the crop or the surrounding vegetation is flowering (McMurtry *et al.* 2013).

Recently, *E. gallicus* has shown potential as a biocontrol agent for thrips and whiteflies in roses when *Typha* sp. (cattail) pollen is supplied as an additional food source (Biobest 2013; Wackers 2013). Provision of pollen as a supplementary food source can improve biological control of whiteflies and thrips by type III phytoseiids (van Rijn and Sabelis 1993; Nomikou *et al*. 2010), and control works excellently in crops where pollen is naturally available (Calvo *et al.* 2012). The population of *Euseius* species can grow faster than the population of type III phytoseiids when pollen is provided as a food source.

This species was already recorded and mentioned in a Slovenian paper (Bohinc *et al.* 2018) but it is the first mention of that species in an international paper for Slovenia.

World distribution: Belgium, Czech Republic, France, Germany, Italy, the Netherlands, Tunisia, Turkey.

Specimens examined: 30 ♀♀, 4 ♂♂ and 4 immatures in total. Parecag (aasl 72 m, lat. 45°28'44"N, long. 13°37'49"E), 1 ♀ on *Diospyros kaki* Thunberg (Ebenaceae), 21/VI/2018; Dragonja (aasl 1 m, lat. 45°27'12"N, long. 13°39'43"E), 1 ♀ on *Pistacia terebinthus* L. (Anacardiaceae), 21/VI/2018; Lucija (aasl 22 m, lat. 45°30'30"N, long. 13°36'11"E), 1 ♀ and 1 immature on *Cucumis sativus* L. (Cucurbitaceae), 11/VII/2018; Ljubljana, Hotel Katrca (aasl 307 m, 46°3'19"N, 14°20'26"E), 2 ♀♀ on *Physocarpus opolifolius* (L.) Maximowicz (Rosaceae) and 1 ♀ and 1 immature on *Carpinus betulus* L. (Betulaceae), 18/VI/2019; Sečovlje, 58a (aasl 3 m, lat. 45°28'43"N, long. 13°37'28"E), 13 ♀♀, 4 ♂♂ and 1 immature on *Cornus sanguinea* L. (Cornaceae) and 3 ♀♀ on *Aesculus hippocastanum* L. (Hippocastanaceae), 19/VI/2019; Bertoki (aasl 28 m, lat. 45°32'55"N, long. 13°47'13"E), 3 ♀♀ on *Prunus persica* L. (Rosaceae) and 1 ♀ on *Actinidia deliciosa* (A. Chevalier) C.F. Liang & A.R. Ferguson (Actinidiaceae), 19/VI/2019; Ankaran (aasl 19 m, lat. 45°34'20"N, long. 13°45'29"E), 3 ♀♀ and 1 immature on *Quercus robur* L. (Fagaceae), 19/VI/2019; Ljubljana, Hotel Katrca (aasl 307 m, 46°3'19"N, 14°20'26"E), 1 ♀ on *Tilia platyphyllos* Scopoli (Malvaceae), 22/VI/2019.

Remarks: The measurements of the adult females collected agree with those provided by Okassa *et al.* (2009), Tixier *et al.* (2010) and Döker *et al.* (2014).

Euseius stipulatus (Athias-Henriot)

Amblyseius stipulatus Athias-Henriot 1960a: 294.
Typhlodromus stipulatus, Hirshmann 1962.
Amblyseius (*Amblyseius*) *stipulatus*, Ueckermann & Loots 1988: 110.
Euseius stipulatus (Athias-Henriot), Ferragut *et al.* 1985: 225; Moraes *et al.* 1986: 55; 2004: 84; Chant & McMurtry 2005b: 216; 2007: 123.

This species was described from Algeria (Athias-Henriot 1960). This species is mainly known from the south of the Western Palearctic region. It is a very common species reported from many plants, including crops such as peach, avocado orchards and vineyards. It is especially abundant in citrus orchards (Ragusa 1977; Ferragut *et al*. 1983; Papaioannou-Souliotis *et al*. 1994; Ragusa 2006; Kreiter *et al*. 2010; Sahraoui *et al*. 2012). Several studies have shown its ability to feed on pollen but also on pests such as *T. urticae* and *P. citri* or eriophyid mites (Ferragut *et al*. 1992; Santaballa *et al*. 1994; Abad-Moyano *et al*. 2009; Pina *et al*., 2012). This species was already recorded and mentioned in a Slovenian paper (Bohinc *et al.* 2018) but it is the first mention of that species in an international paper for Slovenia.

World distribution: Algeria, Azores, Canary Islands, France, Greece, Hungary, Iran, Italy, Madeira Island, Montenegro, Morocco, Peru, Portugal, Spain, Syria, Tunisia, Turkey, USA.

Specimens examined: 23 ♀♀, 5 ♂♂ and 10 immatures in total. Izola-Pivol (aasl 30 m, lat. 45°32'27"N, long. 13°40'51"E), 6 ♀♀, 1 ♂ and 1 immature on *Prunus persica* L. (Rosaceae), 1 ♂ and 1 immature on *Ulmus minor* Miller (Ulmaceae), 3 ♀♀, 3 ♂♂ and 3 immatures on *Pyrus communis* L. (Rosaceae) and 1 ♀ on *Juglans regia* (Juglandaceae), 21/VI/2018; Parecag (aasl 72 m, lat. 45°28'44"N, long. 13°37'49"E), 7 ♀♀ and 2 immatures on *Prunus domestica* L. (Rosaceae), 21/VI/2018; Sečovlje, Parecag 15 (aasl 10 m, lat. 45°28'50"N, long. 13°37'49"E), 1 ♀ and 1 immature on *Prunus cerasus* L. (Rosaceae), 19/VI/2019; Sečovlje, 58a (aasl 3 m, lat. 45°28'43"N, long. 13°37'28"E), 1 ♀ and 1 immature on *Aesculus hippocastanum* L. (Hippocastanaceae), 19/VI/2019; Dragonja (aasl 3 m, lat. 45°27'32"N, long. 13°39'04"E), 1 ♀ and 1 immature on *Prunus pumila* L. (Rosaceae), 19/VI/2018; Bertoki (aasl 28 m, lat. 45°32'55"N, long. 13°47'13"E), 1 ♀ on *P. persica* and 1 ♀ on *Salix daphnoides* Villars (Salicaceae), 19/VI/2018; Purissima (aasl 50 m, lat. 45°34'21"N, long. 13°46'31"E), 1 ♀ on *Capsicum annuum* L. (Solanaceae), 11/VII/2019.

Remarks: The description and measurements of the adult females collected agree with those provided by Ferragut and Escudero (1997) and by Ferragut *et al.* (2010) for specimens from Spain.

Sub-family Phytoseiinae Berlese

Phytoseiini, Berlese 1913: 3; Phytoseiinae, Vitzthum 1941: 768.

Genus *Phytoseius* Ribaga

Phytoseius Ribaga 1904: 177

Phytoseius finitimus Ribaga

Phytoseius finitimus Ribaga 1904: 178; Chant 1959: 108; Moraes *et al.* 1986: 214; 2004: 252; Chant & McMurtry 2007: 129.
Phytoseius (*Dubininellus*) *finitimus*, Wainstein 1959: 1365.
Phytoseius (*Pennaseius*) *finitimus*, Pritchard & Baker 1962: 223.
Pennaseius finitimus, Schuster & Pritchard 1963: 279.
Phytoseius (*Phytoseius*) *finitimus*, Denmark 1966: 16.
Phytoseius dubinini (Beglyarov) (synonymy according to Pritchard & Baker 1962).

Having seta *R1* and *J2* present, this species belongs to the *plumifer* species group of the genus *Phytoseius* (Chant and McMurtry 2007).

This species is mainly reported in Mediterranean countries, and is especially frequent in Israel and Greece. It has been observed mainly on shrubs. A big confusion between *P. finitimus* and *Phytoseius plumifer* (Canestrini and Fanzago) has existed for a long time and a tentative solution has been proposed by Duso and Fontana (2002). We herein follow these authors and do not considered valid the synonymy between these species indicated in Moraes *et al*. (2004).

Phytoseius finitimus has been reported on grapevines and fig tree orchards in several countries in Europe. It seems to feed on *P ulmi* (Duso and Moretto 1994) and various eriophyid mites (Rasmy and El-Banhawy 1974b), and it consumes pollen (Zaher *et al.*, 1969; Rasmy and El-Banhawy 1975). High relative humidities and very hairy-leaved plants or varieties seem to be very suitable for *P. finitimus* (Rasmy and El-Banhawy 1974a; Duso and Moretto 1994).

This is the first report of that species from Slovenia.

World distribution: Algeria, Azores, Egypt, France, Greece, Iran, Israel, Italy, Montenegro, Morocco, Portugal, Spain, Syria, Tunisia, Turkey, USA.

Specimens examined: 2 ♂♂ collected in total. Sečovlje, 58a (aasl 3 m, lat. 45°28'43"N, long. 13°37'28"E), 1 ♂ on *Cornus sanguinea* L. (Cornaceae) and 1 ♂ on *Aesculus hippocastanum* L. (Sapindaceae), 19/VI/2019.

Remarks: The measurements of the two adult males collected agree with those provided by Duso and Fontana (2002) and by Tixier *et al.* (2017).

Phytoseius horridus Ribaga

Phytoseius horridus Ribaga 1904: 178; Chant 1959: 108; Moraes *et al.* 2004: 240; Chant & McMurtry 2007: 129.
Phytoseius (*Dubininellus*) *horridus*, Chant & Athias-Henriot 1960: 221.
Typhlodromus horridus, Hirschmann 1962: 62.
Phytoseius (*Phytoseius*) *horridus*, Moraes *et al.* 1986: 222.

Having seta *R1* and *J2* absent, this species belongs to the *horridus* species group of the genus *Phytoseius* (Chant and McMurtry 2007).

The biology of this species seems totally unknown.

This species was already recorded and mentioned in a Slovenian paper (Bohinc *et al.* 2018), and in international conference paper (Trdan and Bohinc, 2016).

World distribution: Algeria, France, Greece, Italy, Montenegro, Portugal, Spain.

Specimens examined: 23 ♀♀ and 1 ♂ in total. Parecag (aasl 72 m, lat. 45°28'44"N, long. 13°37'49"E), 15 ♀♀ and 1 ♂ on *Prunus domestica* L. (Rosaceae), 21/VI/2018; Škofljica, Gumnišče 15 (aasl 305 m, lat. 45°58'15"N, long. 14°34'17"E), 4 ♀♀ on *Acer campestre* L. (Sapindaceae) and 1 ♀ on *Carpinus betulus* L. (Betulaceae), 18/VI/2019; Dragonja (aasl 3 m, lat. 45°27'32"N, long. 13°39'4"E), 2 ♀♀ on *Prunus pumila* L. (Rosaceae) and 1 ♀ on *Ficus carica* L. (Moraceae), 19/VI/2019.

Remarks: The description and measurements of the adult females collected agree with those provided by Denmark (1966) and by Ferragut *et al.* (2010) for specimens from Spain.

Phytoseius juvenis Wainstein & Arutunjan

Phytoseius (*Dubininellus*) *juvenis* Wainstein & Arutunjan, 1970: 1501.
Phytoseius (*Phytoseius*) *juvenis*, Moraes *et al.* 1986: 223.
Dubininellus juvenis, Karg 1991: 25-26.
Phytoseius juvenis, Moraes *et al.* 2004: 242; Chant & McMurtry 2007: 129.
Phytoseius ciliatus Wainstein (synonymy according to Rahmani *et al.* 2010).

Like the previous species and for the same reasons, *P. juvenis* species belongs to the *horridus* species group of the genus *Phytoseius* (Chant and McMurtry 2007).

The biology of this species seems totally unknown.

This is the first report of that species in Slovenia.

World distribution: Armenia, Czechoslovakia, Czech Republic, Finland, France, Hungary, Iran, Kazakhstan, Latvia, Moldova, Poland, Russia, Serbia, Slovakia, Slovenia, Ukraine.

Specimens examined: 6 ♀♀, 1 ♂ and 3 immatures in total. Arnovo Selo (aasl 192 m, lat. 47°58'07"N, long. 15°33'49"E), 6 ♀♀, 1 ♂ and 3 immatures on *Malus domestica* L. (Rosaceae), 19/VI/2018.

Remarks: The measurements of the adult females collected agree with those provided by Kolodochka (1978) and by Karg (1991).

Sub-family Typhlodrominae Wainstein

Typhlodromini Wainstein 1962: 26; Typhlodrominae, Chant & McMurtry 1994: 235.

Tribe Typhlodromini Wainstein

Typhlodromus Scheuten, Evans 1953: 449.
Typhlodromus (*Typhlodromus*), Chant 1957c: 528.
Typhlodromini Wainstein 1962: 26; Chant & McMurtry 1994: 246; 2007: 144.

Genus *Typhloseiulus* Chant & McMurtry

Typhloseiulus Chant & McMurtry 1994: 246.

Typhloseiulus calabriae (Ragusa & Swirski)

Seiulus calabriae Ragusa & Swirski 1976: 179-182; Kolodochka 1981: 21; Moraes *et al.* 1986: 230.
Typhlodromus calabriae, Chant & Yoshida-Shaul 1983: 1144-1145.
Typhloseiulus calabriae, Moraes *et al.* 2004: 373-374.

This species is mentioned only from few European countries.
Its biology remains totally unknown.
This is the first mention of that species for the Slovenian fauna.
World distribution: Croatia, Greece, Italy, Ukraine.
Specimens examined: 2 ♀♀ in total. Ljubljana, near Hotel Azur (aasl 296 m, lat. 46°02'42"N, long. 14°28'25"E), 2 ♀♀ on *Acer pseudoplatanus* L. (Aceraceae), 19/VI/2018.
Remarks The measurements of the adult females collected agree with those provided by Chant and Yoshida-Shaul (1983) and by Doker (2018) in a recent re-description.

Genus *Neoseiulella* Muma

Neoseiulella Muma 1961: 295.

Neoseiulella aceri (Collyer)

Typhlodromus aceri Collyer 1957: 199-200; Chant 1958: 626; Hirschmann 1962: 12; Livshitz & Kuznetsov 1972: 20; Chant & Yoshida-Shaul 1989: 1013.
Typhlodromus (*Typhlodromus*) *aceri*, Chant 1959: 65; Westerboer & Bernhard 1963: 565-568.
Typhloctonus aceri, Muma 1961: 299; Denmark & Rather 1984: 166-167; Kolodochka 1986: 30-31; Moraes *et al.* 1986: 232; Kolodochka 2009: 486-487.
Typhlodromus (*Nesbitteius*) *aceri*, Wainstein 1962: 23.
Seiulus aceri, Abbasova 1972: 18; Karg & Edland 1987: 387; Steeghs *et al.* 1993: 24.
Seiulus (*Typhloctonus*) *aceri*, Beglyarov 1981: 19.
Paraseiulus aceri, Steeghs *et al.* 1993: 19-27.
Neoseiulella (*Typhloctona*) *aceri*, Denmark & Rather 1996: 60.
Neoseiulella aceri, Moraes *et al.* 2004: 290; Chant & McMurtry 2007: 147.
Heteroseiulus aceris Lehman 1982: 236 (synonymy according to Chant & Yoshida-Shaul 1989a).

This species belongs to the *tiliarum* species group as *JV3* is present, dorsal setae are medium and relatively uniform in length and chelicerae with few teeths.
Neoseiulella aceri was the second most common species on walnut in Czech Republic and the co-occurrence this species and *E. finlandicus* was often observed (Kabicek 2010).
Despite these observations, the biology of this type III species (McMurtry *et al.* 2013) is almost totally unknown. This species is mostly reported on Acer species (Kanouth *et al.* 2012)
This is the first mention of that species for the Slovenian fauna.
World distribution: Azerbaijan, Belgium, Croatia, Czech Republic, England, Finland, France, Greece, Hungary, Italy, Moldova, Norway, Serbia, Slovakia, Sweden, Turkey, Ukraine, USA.
Specimens examined: A single ♀ during the two years-study. Veržej, Near the football stadium (aasl 182 m, lat. 46°35'27"N, long. 16°10'1"E), 1 ♀ on *Acer pseudoplatanus* L. (Aceraceae), 20/VI/2019.
Remarks: The measurements of the adult females collected agree with those provided by Kanouh *et al.* (2012) for the holotype.

Neoseiulella tiliarum (Oudemans)

Typhlodromus tiliarum Oudemans 1930a: 51-52.
Typhlodromus (*Typhlodromus*) *tiliarum*, Chant 1959: 65.
*Typhloctonus tiliarum,*Muma 1961: 299.
Typhlodromus (*Nesbitteius*) *tiliarum*, Wainstein 1962: 22-23.
Seiulus tiliarum, Abbasova 1972: 21; Karg 1982: 205; Karg & Edland 1987: 387.
Seiulus (*Typhloctonus*) *tiliarum*, Beglyarov 1981: 19.
Neoseiulella (*Typhloctona*) *tiliarum*, Denmark & Rather 1996: 58-59.
Neoseiulella tiliarum, Chant & McMurtry 1994: 248; Moraes *et al.* 2004: 296; Chant & McMurtry 2007: 147.
Typhlodromus formosus Wainstein 1958: 206-207 (synonymy according to Chant 1959).

Like the previous species, *N. tiliarum* belongs to the *tiliarum* species group.

Neoseiulla tiliarum is more common in this study than the previous *Neoseiulella* species (see above). It was the most common phytoseiid species on the surveyed urban linden trees in Czech Republic in a recent study (Kabicek 2019). Significantly more specimens of *N. tiliarum* were captured in this Czech study within the well-developed domatia created by overlapping trichomes in the vein axils and near the raised hairy veins on the underside of leaves of *Tilia platyphyllos*, and all specimens of *N. tiliarum* were detected within the similar sheltered leaf tuft domatia microhabitat on the abaxial leaf area of *Tilia cordata* (Barret 1994; Kabicek 2019). The vast majority of specimens of *N. tiliarum* sheltered more deeply within the domatia and persisted within the protected leaf domatia and vein microhabitats when they were repeatedly disturbed. The obvious preference for the sheltered leaf microhabitats among *N. tiliarum* detected on both surveyed *Tilia* spp. is consistent with the results obtained from grapevines (Kreiter *et al.* 2000, 2002) and *Tilia* spp. (Barret 1994). The frequent occurrence and persistence of slowly moving specimens of *N. tiliarum* on the unprotected leaf surface could be hazardous to them, so they prefer the sheltered leaf microhabitats and use the same shelter-based method of defensive strategy to avoid possible macro-predators, similarly to *N. aceri* and *K. aberrans* (Kabicek 2005, 2008). *Neoseiulella tiliarum* has been observed on diverse deciduous trees (Chant and Yoshida-Shaul 1989), plant supports observed below can provide appropriate habitat niches for the survival and persistence of this generalist predator type III (McMurtry *et al.* 2013) in urban and non-urban areas. Despite this information, the biology of that species remains totally unknown.

This species was already recorded from Slovenia (Miklavc 2006; Bohinc and Trdan 2013).

World distribution: Algeria, Austria, Azerbaijan, Canada, Croatia, Czechoslovakia, Czech Republic, Denmark, England, France, Georgia, Germany, Greece, Hungary, Iran, Italy, Macedonia, Moldova, Montenegro, Netherlands, Norway, Poland, Russia, Serbia, Slovakia, Slovenia, Spain, Switzerland, Tunisia, Turkey, Ukraine, USA.

Specimens examined: 14 ♀♀ and 1 ♂ in total. Arnovo Selo (aasl 192 m, lat. 47°58’07”N, long. 15°33’49”E), 4 ♀♀ and 1 ♂ on *Rubus fruticosus* L. (Rosaceae), 19/VI/2018; Izola-Pivol (aasl 30 m, lat. 45°32’27”N, long. 13°40’51”E), 1 ♀ on *Juglans regia* L. (Juglandaceae), 21/VI/2018; Ljubljana, Botanical garden (aasl 296 m, lat. 46°02’02”N, long. 14°30’51”E), 4 ♀♀ on *Celtis australis* L. (Cannabaceae), 21/VI/2018; Ljubljana, Azur Hotel (aasl 296 m, lat. 46°02’42”N, long. 14°28’25”E), 1 ♀ on *Aesculus hippocastanum* L. (Sapindaceae), 21/VI/2018; Pragersko, Kvedrova ulica (aasl 250 m, lat. 46°23’48”N, long. 13°40’11”E), 1 ♀ on *Prunus cerasus* L. (Rosaceae), 20/VI/2019; Veržej, Kasač Restaurant (aasl 182 m, lat. 46°34’44”N, long. 16°09’45”E), 1 ♀ on *Tilia cordata* Miller (Malvaceae), 20/VI/2019; Veržej, Near the football stadium (aasl 182 m, lat. 46°35’27”N, long. 16°10’1”E), 1 ♀ on *Ulmus minor* L. (Ulmaceae), 20/VI/2019; Bled, Lake (aasl 478 m, lat. 46°22’4”N, long. 14°05’06”E), 1 ♀ on *U. minor*, 21/VI/2019.

Remarks: The measurements of the adult females collected agree well with those provided by Kanouh *et al.* (2012) for the holotype and with Ferragut *et al.* (2010) for specimens from Spain.

Genus *Typhlodromus* (*Anthoseius*) Scheuten

Typhlodromus (*Anthoseius*) De Leon, van der Merwe 1968: 20; Karg 1982: 194; Chant & McMurtry 1994: 250; 2007: 149.

Typhlodromus (*Anthoseius*) *bakeri* (Garman)

Seiulus bakeri Garman, 1948: 15.
Typhlodromus (*Neoseiulus*) *bakeri*, Nesbitt 1951: 36-37.
Typhlodromus bakeri, Cunliffe & Baker 1953: 10.
Typhlodromus (*Typhlodromus*) *bakeri*, Chant 1959: 63.
Typhlodromella bakeri, Muma 1961: 299.
Amblydromella bakeri, Muma 1967: 267-280; Moraes *et al.* 1986: 155.
Mumaseius bakeri, Abbasova 1972: 10.
Anthoseius (*Aphanoseius*) *bakeri*, Wainstein 1972: 1477-1482.
Anthoseius bakeri, Beglyarov 1981: 24.
Amblydromella (*Aphanoseia*) *bakeri*, Denmark & Welbourn 2002: 308.
Typhlodromus (*Anthoseius*) *bakeri*, Moraes *et al.* 2004: 311; Chant & McMurtry 2007: 152.
Anthoseius (*Aphanoseius*) *clavatus* Wainstein 1972: 1481 (synonymy according to Evans & Edland 1998).

Having setae *S4*, *JV3* and *JV4* present, setae on dorsal shield setiform approximately equal in length except for *Z4* and *Z5*, which are sometimes longer, setae *r3* and *R1* on lateral integument, and setae of *z-Z* and *s-S* series shorter than distances between their bases, this species belongs to the *rhenanus* species group.

Almost nothing is known about the biology of that species.

This species was already recorded from Slovenia (Miklavc 2006; Bohinc and Trdan 2013).

World distribution: Alaska, Armenia, Australia, Austria, Azerbaijan, Canada, Caucasus Region, Czechoslovakia, Czech Republic, Denmark, England, Finland, France, Germany, Georgia, Greece, Hawaii, Hungary, India, Iran, Italy, Latvia, Montenegro, Netherlands, New Zealand, Norway, Poland, Portugal, Russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, USA.

Specimens examined: 28 ♀♀ and 7 ♂♂ in total. Škofljica, Gumnišče 15 (aasl 305 m, lat. 45°58’15”N, long. 14°34’17”E), 1 ♀ on *Carpinus betulus* L. (Betulaceae) and 1 ♂ on *Rubus fruticosus* L. (Rosaceae), 18/VI/2019; Kočevska Reka, Lake (aasl 567 m, 45°34’33”N, 14°47’25”E), 1 ♀ on *Crateagus monogyna* Jacquin (Rosaceae), 1 ♀ and 1 ♂ on *Abies alba* Miller (Pinaceae), and 1 ♀ on *Corylus avellana* L. (Betulaceae), 18/VI/2019; Ljubljana, Faculty of Biotechnology campus (aasl 307 m, lat. 46°02’54”N, long. 14°28’32”E), 1 ♀ on *Cornus mas* L. (Cornaceae), 18/VI/2019; Sečovlje, 58a (aasl 3 m, lat. 45°28’43”N, long. 13°37’28”E), 1 ♀ on *Juglans regia* L. (Juglandaceae), 19/VI/2019; Dragonja (aasl 3 m, lat. 45°27’32”N, long. 13°39’4”E), 3 ♀♀ and 1 ♂ on *Prunus pumila* L. (Rosaceae), 19/VI/2019; Pragersko, Kvedrova ulica (aasl 250 m, lat. 46°23’48”N, long. 13°40’11”E), 2 ♀♀ and 1 ♂ on *Pinus sylvestris* L. (Pinaceae), 20/VI/2019; Juršinci, Gabrnik 55 (aasl 301 m, 46°28’43”N, 15°58’2”E), 2 ♀♀ on *Malus domestica* L. (Rosaceae), and 2 ♀♀ on *Prunus cerasus* L. (Rosaceae), 20/VI/2019; Veržej, Near the football stadium (aasl 182 m, lat. 46°35’27”N, long. 16°10’1”E), 1 ♀ on *Ulmus minor* L. (Ulmaceae), 2 ♀♀ on *Quercus robur* L. (Fagaceae) and 2 ♀♀ on *Fraxinus excelsior* L. (Oleaceae), 20/VI/2019; Šobec (aasl 418 m, 46°21’22”N, 14°9’2”E), 1 ♀ on *Picea abies* (L.) H. Karsten (Pinaceae) and 1 ♀ and 1 ♂ on *P. sylvestris*, 2 ♀♀ and 1 ♂ on *Q. robur*, 1 ♀ and 1 ♂ on *Prunus padus* L. (Rosaceae) and 1 ♀ on *F. excelsior*, 21/VI/2019; Bled, Lake (aasl 478 m, lat. 46°22’4”N, long. 14°05’06”E), 1 ♀ on *Alnus glutinosa* L. (Betulaceae), 21/VI/2019; Kranj (aasl 434 m, 46°16’6”N, 14°20’26”E), 1 ♀ on *C. mas*, 21/VI/2019.

Remarks: The description and measurements of the adult females collected agree with those provided by Chant *et al.* (1974), by Karg (1982) and by Ferragut *et al.* (2010) for specimens from Spain.

Typhlodromus (*Anthoseius*) *foenilis* Oudemans

Typhlodromus foenilis Oudemans 1930b: 70.
Anthoseius (*Amblydromellus*) *foenilis*, André 1986: 111.
Amblydromella foenilis, Moraes *et al*. 1986: 173.
Anthoseius foenilis, Evans & Edland 1998: 41-62.
Amblydromella (*Aphanoseia*) *foenilis*, Denmark & Welbourn 2002: 308.
Typhlodromus (*Anthoseius*) *foenilis*, Moraes *et al*. 2004: 323; Chant & McMurtry 2007: 152.

For same reasons than the previous species, this species belongs to the *rhenanus* species group.

The biology of this type III species (McMurtry *et al.* 2013) is almost totally unknown.

This is the first mention of that species for the Slovenian fauna.

World distribution: Belgium, Cyprus, England, Greece, Ireland, Morocco, Netherlands, Norway, Spain, Syria, Tunisia, Turkey.

Specimens examined: A single ♀ during the two years-study. Ankaran (aasl 19 m, lat. 45°34'20"N, long. 13°45'29"E), 1 ♀ on *Quercus robur* L. (Fagaceae), 19/VI/2019;

Remarks: The description and measurements of the adult females collected agree with those provided by Faraji *et al.* (2007) and by Ferragut *et al.* (2010) for specimens from Spain. This species is very close to *T.* (*A.*) *cryptus*, considered to be a junior synonym by several authors.

Typhlodromus (*Anthoseius*) *recki* Wainstein

Typhlodromus recki Wainstein 1958: 203.
Typhlodromus (*Typhlodromus*) *recki*, Chant 1959: 62.
Typhlodromella recki, Muma 1961: 299.
Typhlodromus (*Neoseiulus*) *recki*, Ehara 1966: 18.
Anthoseius (*Amblydromellus*) *recki*, Kolodochka 1980: 39.
Anthoseius recki, Swirski & Amitai 1982: 58.
Amblydromella recki, Moraes *et al*. 1986: 171.
Amblydromella (*Aphanoseia*) *recki*, Denmark & Welbourn 2002: 308.
Typhlodromus (*Anthoseius*) *recki*, Ueckermann & Loots 1988: 18, 21; Moraes *et al*. 2004: 344; Chant & McMurtry 2007: 155.

For same reasons than the previous species, this species belongs to the *rhenanus* species group.

This species is commonly found in uncultivated areas and sometimes in crops in Europe, mainly on plants of the family Lamiaceae. However, no data on its biology were available until recently. Five populations of this species collected in South of France have been studied. Their abilities to eat *Tetranychus urticae* as well as their fecundity were assessed in lab experiments. Differences between the five populations have been observed. The fecundity rates (number of eggs/ female/ day) ranges between 0.5 and 1.4. The number of eggs of *T. urticae* consumed per female and per day ranges between 8 and 18. When the amount of prey is important in first days of the experiment, predation rates higher than 40 eggs consumed per female per day have been observed (Tixier *et al.* 2016). The number of prey consumed for some of the populations herein tested is quite similar to those reported for some predatory mite species used in biological control, such as *Neoseiulus californicus*, for example. Such results emphasize the potential capacity of that species to regulate *T. urticae*. Furthermore, as this species is endemic of Europe, such results open new insights for using endemic biodiversity to limit side effects of biological control within international exchange rules. However, additional studies are clearly needed to determine optimal rearing conditions, prey ranges and predation behaviour in field conditions (Tixier *et al.* 2016).

This is the first mention of that species for the Slovenian fauna.

World distribution: Algeria, Armenia, Austria, Azerbaijan, Caucasus Region, Cyprus, France, Georgia, Greece, Hungary, Iran, Israel, Italy, Kazakhstan, Lebanon, Moldova, Morocco, Portugal, Russia, Syria, Tunisia, Turkey, Ukraine.

Specimens examined: 4 ♀♀ in total. Parecag (aasl 72 m, lat. 45°29'06"N, long. 13°37'41"E), 1 ♀ on *Fragaria* sp. (Rosaceae), 11/VII/2018; Škofljica, Gumnišče 15 (aasl 305 m, lat. 45°58'15"N, long. 14°34'17"E), 1 ♀ on *Carpinus betulus* L. (Betulaceae), 18/VI/2019; Bled, Lake (aasl 478 m, lat. 46°22'4"N, long. 14°05'06"E), 1 ♀ on *Ulmus minor* L. (Ulmaceae), 21/VI/2019; Spodnje Škofije-Purissima (aasl 50 m, lat. 45°34'21"N, long. 13°46'31"E), 1 ♀ on *Capsicum annuum* L. (Solanaceae), 11/VII/2019.

Remarks: The description and measurements of the adult females collected agree with those provided by Ferragut *et al.* (2010) for specimens from Spain and by Ferragut (2018) for specimens from the Azores Archipelago.

Typhlodromus (*Anthoseius*) *rhenanus* (Oudemans)

Seiulus rhenanus Oudemans 1905: 78.
Typhlodromus (*Neoseiulus*) *rhenanus*, Nesbitt 1951: 38-39.
Typhlodromus rhenanus, Cunliffe and Baker 1953: 9.
Typhlodromus (*Typhlodromus*) *rhenanus*, Chant 1959: 62-63.
Typhlodromella rhenana, Muma 1961: 299.
Anthoseius rhenanus, Wainstein and Kolodochka 1974: 28
Anthoseius (*Amblydromellus*) *rhenanus*, Kolodochka 1978: 63-64.
Typhlodromus (*Amblydromella*) *rhenanus*, Gupta 1985: 396.
Amblydromella rhenana, Moraes *et al.* 1986: 172.
Typhlodromella rhenana, Evans and Momen 1988: 209-216.
Amblydromella (*Aphanoseia*) *rhenana*, Denmark and Welbourn 2002: 308.
Typhlodromus (*Anthoseius*) *rhenanus*, Moraes *et al.* 2004: 345; Chant and McMurtry 2007: 155.
Anthoseius tortor Beglyarov and Malov, 1978: 7 (synonymy according to Evans and Edland 1998).

For same reasons than the previous species, this species belongs to the *rhenanus* species group.

Almost nothing is known about the biology of that species.

This species was already recorded from Slovenia (Miklavc 2006; Bohinc and Trdan 2013).

World distribution: Algeria, Azerbaijan, Belarus, Belgium, Brazil, Canada, Cyprus, Denmark, England, Finland, France, Germany, Greece, Hungary, India, Iran, Israel, Italy, Kazakhstan, Latvia, Lithuania, Madeira Island, Moldova, Montenegro, Netherlands, Nicaragua, Northern Ireland, Norway, Poland, Portugal, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Tunisia, Turkey, Ukraine, USA.

Specimens examined: 2 ♀♀ in total. Rakitnica, Dolenja vas (aasl 490 m, lat. 45°41'12"N, long. 14°45'20"E), 2 ♀♀ on *Corylus avellana* L. (Betulaceae), 18/VI/2019.

Remarks: The description and measurements of the adult females collected agree with those provided by Ferragut *et al.* (2010) for specimens from Spain.

Genus *Typhlodromus* (*Typhlodromus*) Scheuten

Typhlodromus Scheuten 1857: 111; *Typhlodromus* (*Typhlodromus*) Chant 1957: 528.

Typhlodromus (*Typhlodromus*) *ernesti* Ragusa & Swirski

Typhlodromus ernesti Ragusa & Swirski 1978: 211; Moraes *et al.* 1986: 243.
Typhlodromus ernesti postici, Karg 1989: 275.
Typhlodromus (*Typhlodromus*) *ernesti*, Moraes *et al.* 2004: 364; Chant & McMurtry 2007: 157.

The biology of this type III species (McMurtry *et al.* 2013) is almost totally unknown.

This is the first mention of that species for the Slovenian fauna.

World distribution: Austria, France, Hungary, Israel, Italy, Norway, Russia, Spain, Sweden, Tunisia, Ukraine.

Specimens examined: 11 ♀♀, 3 ♂♂ and 2 immatures in total. Rakitnica, Dolenja vas (aasl 490 m, lat. 45°41'12"N, long. 14°45'20"E), 2 ♀♀ on *Picea abies* (L.) H. Karsten (Pinaceae), 18/VI/2019; Pragersko, Kvedrova ulica (aasl 250 m, lat. 46°23'48"N, long. 13°40'11"E), 1 ♀ on *P. abies*, 20/VI/2019; Šobec (aasl 418 m, 46°21'22"N, 14°9'2"E), 1 ♀ on *P. abies* and 1 ♀ on *Aesculus hippocastanum* L. (Sapindaceae), 21/VI/2019; Bled, Lake (aasl 478 m, lat. 46°22'4"N, long. 14°05'06"E), 5 ♀♀, 3 ♂♂ and 2 immatures on *P. abies*, 21/VI/2019; Labore (aasl 362 m, lat. 46°10'17"N, long. 14°23'12"E), 1 ♀ on *P. abies*, 21/VI/2019.

Remarks: The measurements of the adult females collected agree with those provided by Tixier *et al.* (2019).

Typhlodromus (*Typhlodromus*) *pyri* Scheuten

Typhlodromus pyri Scheuten 1857: 104; Moraes *et al.* 1986: 246.
Typhlodromus (*Typhlodromus*) *pyri*, Chant 1959: 64.
Typhlodromus (*Typhlodromus*) *pyri*, Moraes *et al.* 2004: 367; Chant & McMurtry 2007: 157.

This species is cosmopolitan but is the dominant species in vineyards and orchards in the western part of Europe. It has been introduced in various countries such as Australia and New Zealand for biological control purposes. It has been reported on a wide range of plants, essentially on cultivated and uncultivated shrubs and trees This species is an active predator of red and yellow spider mites and eriophyid mites mainly in orchards and vineyards and of the grape thrips *Drepanothrips reuteri* (Uzel) in France (Serrano *et al.* 2004).

This species was one of the more abundant collected species within this survey.

This species was already recorded from Slovenia (Miklavc 2006; Bohinc and Trdan 2013).

World distribution: Australia, Austria, Azerbaijan, Belarus, Belgium, Canada, Chile, Croatia, Czechoslovakia, Czech Republic, Denmark, Egypt, England, Finland, France, Germany, Greece, Hungary, Italy, Madeira Island, Moldova, Montenegro, Netherlands, New Zealand, Northern Ireland, Norway, Poland, Portugal, Russia, Saudi Arabia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, USA.

Specimens examined: : 112 ♀♀, 12 ♂♂ and 7 immatures. Ravni (aasl 300 m, lat. 45°56'44"N, long. 15°24'21"E), 7 ♀♀, 1 ♂ and 2 immatures on *Vitis vinifera* L. (Vitaceae), 19/VI/2018; Arnovo selo (aasl 192 m, lat. 47°58'07"N, long. 15°33'49"E), 9 ♀♀ and 1 immature on *Malus domestica* L. (Rosaceae) and 9 ♀♀, 3 ♂♂ and 1 immature on *Tilia cordata* Miller (Malvaceae), 19/VI/2018; Bilje (aasl 72 m, lat. 45°53'60"N, long. 13°38'41"E), 4 ♀♀ and 1 immature on *V. vinifera*, 20/VI/2018; Dragonja (aasl 3 m, lat. 45°27'12"N, long. 13°39'43"E), 1 ♀ on *V. vinifera*, 21/VI/2019; Maribor, Plant Protection Institute (aasl 267 m, lat. 46°34'07"N, long. 15°38'12"E), 43 ♀♀ and 2 ♂♂ on *M. domestica* and 28 ♀♀, 6 ♂♂ and 1 immature on *V. vinifera*, 22/VI/2018; Pesnica (aasl 256 m, lat. 46°37'02"N, long. 15°40'58"E), 3 ♀♀ and 1 immature on *M. domestica*, 22/VI/2018; Škofljica, Gumnišče 15 (aasl 305 m, lat. 45°58'15"N, long. 14°34'17"E), 1 ♀ on *Carpinus betulus* L. (Betulaceae) and 2 ♀♀ on *Rubus fruticosus* L. (Rosaceae), 18/VI/2019; Juršinci, Gabrnik 55 (aasl 301 m, lat. 46°28'43"N, long. 15°58'2"E), 1 ♀ on *M. domestica* and 1 ♀ on *Rubus tomentosus* Borkhausen (Rosaceae), 20/VI/2019; Bled, Lake (aasl 478 m, lat. 46°22'4"N, long. 14°05'06"E), 2 ♀♀ on *Acer pseudoplatanus* L. (Sapindaceae), 21/VI/2019; Kranj (aasl 434 m, 46°16'6"N, 14°20'26"E), 1 ♀ on *Picea abies* (L.) H. Karsten (Pinaceae), 21/VI/2019.

Remarks: The measurements of the adult females collected agree with those provided by Ferragut *et al.* (2010) for specimens from Spain and by Tixier *et al.* (2019) for specimens from France.

Conclusion

Fourteen species were previously reported from Slovenia with four additional species published in a national journal (Bohinc *et al.* 2018) and not mentioned in the world database of Phytoseiidae (Demite *et al.* 2020).

In this study carried out in 2018 and 2019 within an international project Proteus France-Slovenia, we add 18 new recorded species for the country and four additional species published in a national journal but nor referenced at international level (Demite *et al.* 2020).

This is surprising that 6 Phytoseiidae species already mentioned were not here recovered: *Neoseiulus cucumeris* (Oudemans), *N. reductus* (Wainstein), *Phytoseius macropilis* (Banks), *Paraseilus soleiger* (Ribaga), *P. talbii* (Athias-Henriot) and *P. triporus* (Chant and Yoshida-Shaul).

The fauna of Phytoseiidae of Slovenia is now of 36 species, 22 Amblyseiinae, 4 Phytoseiinae and 10 Typhlodrominae.

We add also 9 BCA for the country, potentially usable in biological control in Slovenia without introduction permits as they are recorded in the country.

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