Pestic. Phytomed. (Belgrade), 37(3), 2022, 85–93
DOI: https://doi.org/10.2298/PIF2203085M

UDC 632.7:595.4:591.526 (497.11)
Original scientific paper

The dark-red spider mite, *Tetranychus ludeni* Zacher (Acari: Tetranychidae) – a new pest in Serbian acarofauna

Ivana Marić*, Irena Međo and Dejan Marčić

Institute of Pesticides and Environmental Protection, Laboratory of Applied Entomology, Banatska 31B, 11080 Belgrade, Serbia
**Corresponding author: ivamar24@gmail.com*

Received: 26 October 2022
Accepted: 5 December 2022

SUMMARY

The dark-red spider mite, *Tetranychus ludeni* Zacher (Acari: Tetranychidae), is a highly polyphagous species and an important pest of economic plants belonging to the families Cucurbitaceae, Malvaceae, Fabaceae and Solanaceae, and growing in tropical and subtropical regions. In the Western Palaearctic, its distribution reports have recently come mostly from the Mediterranean Basin, i.e. Portugal, Spain, Italy and Israel. In a survey conducted in Serbia 2019-2021 (comprising 159 sampling locations), *T. ludeni* was found at 89 locations on 27 plant species of the families Rosaceae (8), Solanaceae (6), Cucurbitaceae (4), Fabaceae (2), Amaranthaceae (2), Asteraceae (2), Apiaceae (1), Convolvulaceae (1) and Poaceae (1). The dark-red spider mite was found in mixed populations with other spider mites (mostly *Tetranychus urticae* and *T. turkestani*) in around half of the sampling locations. Heavy infestation and visible symptoms of injury were observed in several locations. Three Rosaceae plant species, plum (*Prunus domestica*), blackthorn (*Prunus spinosa*) and crab apple (*Malus sylvestris*) were its new hosts. Serbian records of *T. ludeni* from locations situated at latitudes between 42°N and 46°N were the northernmost distribution records of this species in the Western Palaearctic.

Keywords: spider mites, *T. ludeni*, plant pest, distribution, Serbia

INTRODUCTION

The dark-red spider mite, *Tetranychus ludeni* Zacher (Acari: Tetranychidae), is a highly polyphagous species and an important pest of economic plants belonging to the families Cucurbitaceae, Malvaceae, Fabaceae and Solanaceae. This species is also known as the red-legged spider mite and the bean red mite. Although its original description was based on specimens collected in Germany (Zacher, 1913), and a later report from France (Hardouin, 1934), *T. ludeni* is now considered to be a species of tropical origin (Vacante, 2016; Migeon & Dorkeld, 2022).

In the Western Palaearctic, distribution reports of *T. ludeni* have recently come mostly from the Mediterranean Basin, i.e. the Azores, Madeira, Canaries, central and southern parts of Portugal, Spanish Mediterranean coast, Sicily and Israel (Hurtado et al., 2008; Ben-David et al., 2013; Ragusa et al., 2019; Naves et al., 2021). Over the last 50 years, the dark-red spider mite has also been reported in Greece, Egypt and Morocco (Migeon & Dorkeld, 2022). In a recent survey, this species was recorded in Serbia for the first time.

MATERIAL AND METHODS

Mite sampling was carried out in 159 locations across Serbia from April to October over the period 2019-2021. We chose plants with obvious symptoms of spider mite infestation, as well as some plants typical for that sampling location, and also host plants preferred by spider mites. Mite population size was ranked as small (+), moderate (++) and large (+++). Geographical coordinates, altitudes, host plants and dates of collection were recorded for each sample. Each host plant was assigned to corresponding habitat type according to EUNIS classification of habitat types (Davies et al., 2004). Mites were hand-picked directly from plants, using a paint brush, or mites were extracted from leaf samples in the laboratory by the soaking-washing-filtering method. All specimens were temporarily preserved in 70% ethyl alcohol and then cleared in lactic acid (50%) for 24-48 hours and mounted in Hoyer's medium. Mites were examined using a Leica DMLB II phase contrast microscope and measured using the imaging software Perfect Image® (Clara Vision) coupled with ProgRes® Capture Pro 2.6 software for image acquisition.

A catalogue of Bolland et al. (1998) was used for sample identification to the genus level. We also used several other relevant keys, books and pa pers for species identification (Pritchard & Baker, 1955; Reck, 1959; Baker & Pritchard, 1960; Meyer, 1987; Vacante, 2016). Identification was confirmed by Philippe Auger and Alain Migeon of the CBGP-INRA, Montpellier, France.

RESULTS AND DISCUSSION

Identification of *T. ludeni* was based on both male and female morphological characters. *T. ludeni* females are mostly dark red, their legs and gnathosoma are paler than the rest of the body. The female also has empodia I-IV with dorsal spur minute or absent, and tarsus I with sockets of zero tactile setae entirely proximal to the socket of the proximal duplex but with four overlapping tactile setae. Pregenital striae are longitudinal and with anterior band of broken striae peritreme with long hook. The male has empodia I-IV with obvious dorsal spur above proximoventral hairs, empodia I with proximoventral hairs fused to form ventral claw, and peritremes are as in females, with recurved hook. The main diagnostic character is the aedeagus, which is dorsally directed, with very short neck and small knob, and specific triangular anterior projection; posterior projection is absent and ventral margin of shaft evenly curved (Figure 1).

The dark-red spider mite was found at 89 sampling locations across the country (Figure 2). Mites were collected in various types of habitat (Table 1A-C), mostly in regularly or recently cultivated agricultural, horticultural and domestic habitats. The species was found together with other spider mites (mostly *Tetranychus urticae* and *T. turkestani*) at around half of the locations (Tables 1A-C).

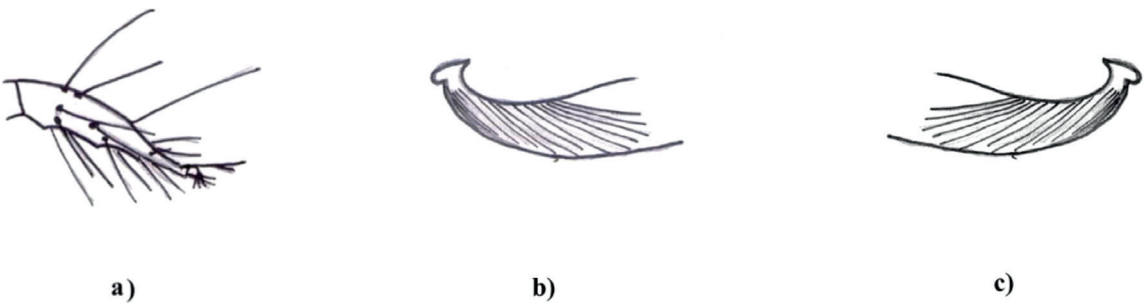
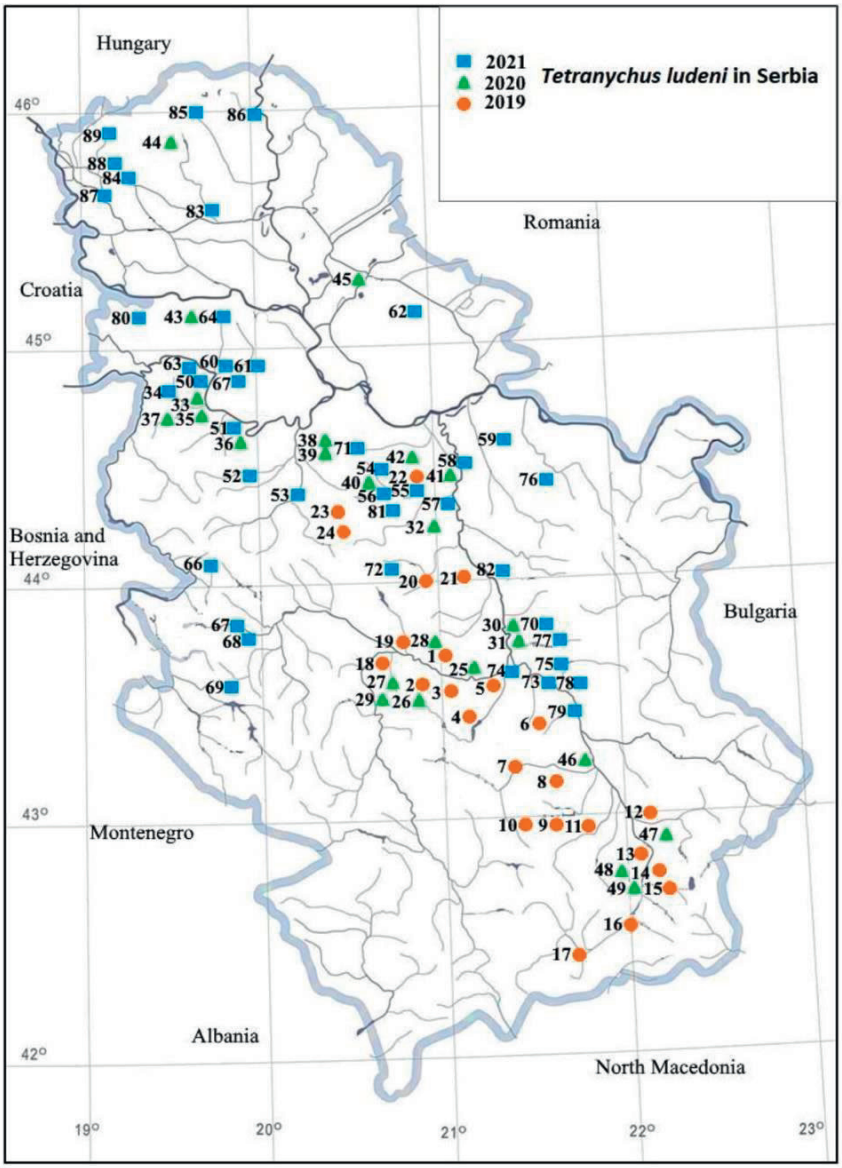


Figure 1. a) tarsus I (female); b, c) male aedeagus, different projections



Sampling locations

1	Trstenik -Medveđa
2	Trstenik - Čairi
3	Trstenik - Počekovina
4	Kruševac - Mala Vrbnica
5	Kruševac - Čitluk
6	Kruševac – Vel. Šiljegovac
7	Blace - Gornja Draguša
8	Prokuplje - Podina
9	Bojnik - Crkvice
10	Bojnik - Magaš
11	Leskovac - Milanovo
12	Leskovac - Bratmilovce
13	Leskovac - Gornji Bunibrod
14	Predejane - Bričevlje
15	Surdulica - Belo Polje
16	Vranje - Zlatokop
17	Bujanovac - Lučane
18	Kraljevo - Ratina
19	Kraljevo - Stubal
20	Kragujevac – Vel. Pčelice
21	Jagodina - Trnava
22	Smed. Palanka - Glibovac
23	Aranđelovac - Garaši
24	Topola - Vinča
25	Kruševac - Velika Drenova
26	Trstenik - Počekovina
27	Vrnjačka Banja - Štulac
28	Trstenik – Medveđa
29	Trstenik - Čairi
30	Paraćin - Čepure
31	Paraćin - Ratare
32	Batočina - Badnjevac
33	Šabac - Štitar
34	Šabac - Dobrić
35	Bogatić
36	Vladimirci - Jalovnik
37	Prnjavor - Petlovača
38	Barajevo - Guncati
39	Barajevo - Beljina
40	Mladenovac - Međulužije
41	Velika Plana - Krnjevo
42	Sm. Palanka - Selevac
43	Sr. Mitrovica - Manđelos
44	Bačka Topola - Krivaja
45	Zrenjanin - Orlovat
46	Niš - Donje Međurovo
47	Leskovac - Donje Krajince
48	Leskovac - Gornji Bunibrod
49	Predejane - Gravovo
50	Šabac - Štitar
51	Vladimirci - Skupljen
52	Ub - Trlić
53	Lazarevac - Šopići
54	Smed. Palanka - Kusadak
55	Smed. alanka – Cerova
56	Smed. Palanka - Ratari
54	Smed. Palanka - Novo Selo
58	Velika Plana - Krnjevo
59	Požarevac - Prugovo
60	Ruma - Jarak
61	Pećinci - Sibač
62	Alibunar - Seleuš
63	Sr. Mitrovica - Glušci
64	Sr. Mitrovica - Manđelos
65	Šabac - Drenovac
66	Valjevo - Zarožje
67	Užice - Buar
68	Užice - Gorjani
69	Zlatibor - Rožanstvo
70	Paraćin - Striža
71	Barajevo - Guberevac
72	Kragujevac - Donja Sabanta
73	Ćićevac
74	Trstenik - Mrzenica
75	Deligrad - Praskovče
76	Petrovac na Mlavi - Knežica
77	Paraćin - Mirilovac
78	Ražanj - Poslon
79	Aleksinac - Moravac
80	Šid
81	Velika Plana - Markovac
82	Jagodina - Ribare
83	Srbobran
84	Sivac
85	Subotica- Novi Žednik
86	Senta - Gornji Breg
87	Apatin - Svilojevo
88	Sombor - Kljajićevo
89	Sombor - Gakovo

Figure 2. Distribution of *Tetranychus ludeni* in Serbia 2019 -2021

Table 1A. Distribution records of *Tetranychus ludeni* in Serbia in 2019

No.	Sampling locations (see Figure 1)	Host plants (see Table 2)	Habitat codes	Population size	Other spider mite species
1.	Trstenik -Medveđa	10	I1.1	+++	*T. urticae*
2.	Trstenik - Čairi	9	I1.2	++	*T. urticae*
3.	Trstenik - Počekovina	10	I1.2	+	
4.	Kruševac - Mala Vrbnica	16, 17	I1.1	+++	
5.	Kruševac - Čitluk	15, 16	I1.1	+	
6.	Kruševac - Veliki Šiljegovac	9	I1.1	+	*T. turkestani*
7.	Blace - Gornja Draguša	9	I1.2	+	
8.	Prokuplje - Podina	16	I1.2	+++	
9.	Bojnik - Crkvice	14	I1.2	+++	*T. urticae*
10.	Bojnik - Magaš	24	I1.1	++	*T. urticae, E. pruni*
11.	Leskovac - Milanovo	11	I1.1	+	
12.	Leskovac - Bratmilovce	25	I1.2	+	
13.	Leskovac - Gornji Bunibrod	14, 16	I1.2	++	
14.	Predejane - Bričevlje	9, 14	I1.2	+	
15.	Surdulica - Belo Polje	9	I1.1	+	
16.	Vranje - Zlatokop	14	I1.1	++	*T. urticae*
17.	Bujanovac - Lučane	9, 14	I1.1	++	
18.	Kraljevo - Ratina	9, 14	I1.3	+	*T. urticae*
19.	Kraljevo - Stubal	9	I1.1	+	
20.	Kragujevac - Velike Pčelice	14, 16	I1.2	+	
21.	Jagodina - Trnava	9	I1.2	+	
22.	Sm. Palanka - Glibovac	7	I1.1	++	*T. urticae*
23.	Aranđelovac - Garaši	21	I1.2	++	*P. citri, E. carpini*
24.	Topola - Vinča	21	I1.1	+	*T. urticae, E. pruni*

I **Regularly or recently cultivated agricultural, horticultural and domestic habitats:** I1.1 = Intensive unmixed crops; I1.2 = Mixed crops of market gardens and horticulture; I1.3 = Arable land with unmixed crops grown by low-intensity agricultural methods

Table 1B. Distribution records of *Tetranychus ludeni* in Serbia in 2020

No.	Sampling locations (see Figure 1)	Host plants (see Table 2)	Habitat codes	Population size	Other spider mite species
25.	Kruševac - Velika Drenova	9	I1.2	+++	*T. urticae*
26.	Trstenik - Počekovina	9	I1.2	+++	*T. urticae, T. turkestani*
27.	Vrnjačka Banja - Štulac	9, 16	I1.1	+++	*T. turkestani, T. evansi*
28.	Trstenik – Medveđa	9	I1.1	+	
29.	Trstenik - Čairi	10	I1.1	+++	
30.	Paraćin - Čepure	7	I1.1	+	
31.	Paraćin - Ratare	9	I1.3	+	
32.	Batočina - Badnjevac	8	I2.3	+	*T. urticae, T. evansi*
33.	Šabac - Štitar	7	J2.4	+	*T. evansi*
34.	Šabac - Dobrić	9	J2.4	++	*T. urticae, T. turkestani*
35.	Bogatić	9	I1.2	++	*T. turkestani*
36.	Vladimirci - Jalovnik	5, 9	I1.2	+	*T. urticae*
37.	Prnjavor - Petlovača	11	I1.2	+	
38.	Barajevo - Guncati	19	I2.3	+	
39.	Barajevo - Beljina	9	J2.4	+	*T. urticae*
40.	Mladenovac - Međulužije	9, 11	J2.4	+++	*T. urticae*
41.	Velika Plana - Krnjevo	11	I1.1	+++	
42.	Sm. Palanka - Selevac	7	I1.1	+	
43.	Sremska Mitrovica - Manđelos	10	I1.1	+	
44.	Bačka Topola - Krivaja	10	I2.3	+	
45.	Zrenjanin - Orlovat	9, 10	I1.3	+	*T. urticae*
46.	Niš - Donje Međurovo	9	I1.1	+++	
47.	Leskovac - Donje Krajince	9	I1.1	+	
48.	Leskovac - Gornji Bunibrod	9, 10	I1.1	+++	*T. urticae*
49.	Predejane - Gravovo	11	I1.2	+	*T. turkestani*

I **Regularly or recently cultivated agricultural, horticultural and domestic habitats:** I1.1 = Intensive unmixed crops; I1.2 = Mixed crops of market gardens and horticulture; I1.3 = Arable land with unmixed crops grown by low-intensity agricultural methods; I2.3 = Recently abandoned garden areas. **J = Constructed, industrial and other artificial habitats:** J2.4 = Agricultural constructions

Table 1C. Distribution records of *Tetranychus ludeni* in Serbia in 2021

No.	Sampling locations (see Figure 1)	Host plants (see Table 2)	Habitat codes	Population size	Other spider mite species
50.	Šabac - Štitar	2, 7, 9, 10	I1.2	+	*T. urticae*
51.	Vladimirci - Skupljen	2, 4, 6, 7, 10, 11, 13	I1.2	+++	*T. urticae*
52.	Ub - Trlić	2, 9	I1.2	+	
53.	Lazarevac - Šopići	4, 6, 13	I2.2	++	
54.	Smederevska Palanka - Kusadak	2, 10, 11, 19	J2.4	++	
55.	Smederevska Palanka - Cerova,	7, 11	J2.4	++	*T. turkestani*
56.	Smederevska Palanka - Ratari	6, 7, 11	J2.4	+	*T. urticae*
57.	Smedervska Palanka - Novo Selo	9, 10	I1.2	+	
58.	Velika Plana - Krnjevo	2, 3, 9	J2.4	++	*T. urticae*
59.	Požarevac - Prugovo	1, 6	I1.3	++	
60.	Ruma - Jarak	7	I1.1	++	
61.	Pećinci - Sibač	1, 6, 19	I1.1	+++	*T. urticae*
62.	Alibunar - Seleuš	10, 11	I1.2	++	*T. urticae*
63.	Sremska Mitrovica - Glušci	7, 9, 11	J2.4	++	*T. urticae*
64.	Sremska Mitrovica - Manđelos	6, 8, 9	J2.4	+++	
65.	Šabac - Drenovac	7, 8, 9, 11	I1.1	++	*T. urticae, T. turkestani*
66.	Valjevo - Zarožje	1, 6	I1.3	+	
67.	Užice - Buar	8, 10	I1.2	+++	
68.	Užice - Gorjani	1, 7	I1.3	++	*T. urticae*
69.	Zlatibor - Rožanstvo	9, 10, 11	I1.3	+	
70.	Paraćin - Striža	2, 3, 7, 10, 11	I1.2	+	*T. urticae*
71.	Barajevo - Guberevac	7, 19	I1.3	++	
72.	Kragujevac - Donja Sabanta	2, 3, 6, 8, 9	J2.4	+	
73.	Ćićevac	8, 9, 12, 18, 27	J2.4	+	
74.	Trstenik - Mrzenica	7, 9, 11	I1.1	+	
75.	Deligrad - Praskovče	20, 22, 23	I1.1	+++	*T. urticae*
76.	Petrovac na Mlavi - Knežica	2, 5, 8, 11, 12, 18	I1.1	+	
77.	Paraćin - Mirilovac	9, 12, 19	J2.4	+	*T. urticae, T. turkestani*
78.	Ražanj - Poslon	7, 9, 10, 19	I1.1	++	
79.	Aleksinac - Moravac	7, 10	I1.1	+	*T. urticae*
80.	Šid	7, 16	I1.2	+	
81.	Velika Plana - Markovac	20, 21, 26	I1.1	+	*T. urticae*
82.	Jagodina - Ribare	7, 9, 10, 11, 12	I1.1	++	*T. urticae*
83.	Srbobran	8, 10, 11, 27	I2.1	+	*T. urticae*
84.	Sivac	9, 16, 18	I1.1	+	*T. turkestani*
85.	Subotica- Novi Žednik	2, 3, 10, 11, 12, 19	J2.4	+	
86.	Senta - Gornji Breg	5, 6	J2.4	+	
87.	Apatin - Svilojevo	8, 10, 16	J2.4	++	*T. turkestani*
88.	Sombor - Kljajićevo	7, 16	I2.2	+	
89.	Sombor - Gakovo	9, 10, 16	I2.2	+	*T. urticae*

I **Regularly or recently cultivated agricultural, horticultural and domestic habitats:** I1.1 = Intensive unmixed crops; I1.2 = Mixed crops of market gardens and horticulture; I1.3 = Arable land with unmixed crops grown by low-intensity agricultural methods; I2.1 = Large scale ornamental garden areas; I2.2 = Small-scale ornamental and domestic garden areas; **J = Constructed, industrial and other artificial habitats:** J2.4 = Agricultural constructions

This spider mite species was found on 27 host plant species of nine plant families (Table 2): Rosaceae (8), Solanaceae (6), Cucurbitaceae (4), Fabaceae (2), Amaranthaceae (2), Asteraceae (2), Apiaceae (1), Convolvulaceae (1) and Poaceae (1). Three Rosaceae plant species, plum (*Prunus domestica*), blackthorn (*Prunus spinosa*) and crab apple (*Malus sylvestris*), were its new hosts. Large populations of dark-red spider mite and visible symptoms of injury were observed at 17 sampling locations (mostly on host plants in Fabaceae and Cucurbitaceae families), of which *T. ludeni* was found at 10 locations in mixed populations with other spider mites.

Table 2. Host plants of *Tetranychus ludeni* in Serbia 2019 -2021

Plant family	Host plant species (see Table 1 A-C)	Common name
Amaranthaceae	1. *Beta vulgaris*	sugar beet
	2. *Spinacia oleracea*	spinach
Apiaceae	3. *Daucus carota*	carrot
Asteraceae	4. *Cirsium arvense*	creeping thistle
	5. *Taraxacum officinale*	dandelion
Convolvulaceae	6. *Convolvulus arvensis*	bindweed
Cucurbitaceae	7. *Citrullus lanatus*	watermelon
	8. *Cucumis melo*	melon
	9. *Cucumis sativus*	cucumber
	10. *Cucurbita pepo*	pumpkin
Fabaceae	11. *Phaseolus vulgaris*	common bean
	12. *Pisum sativum*	pea
Poaceae	13. *Zea mays*	maize
Solanaceae	14. *Capsicum annuum*	pepper
	15. *Datura stramonium*	thorn apple
	16. *Solanum lycopersicum*	tomato
	17. *Solanum melongena*	eggplant
	18. *Solanum nigrum*	black nightshade
	19. *Solanum tuberosum*	potato
Rosaceae	20. *Cydonia oblonga*	quince
	21. *Malus domestica*	apple
	22. *Malus sylvestris* ▼	crab apple
	23. *Prunus avium*	sweet cherry
	24. *Prunus domestica* ▼	plum
	25. *Prunus spinosa* ▼	blackthorn
	26. *Pyrus communis*	pear
	27. *Rosa canina*	dog rose

(▼ new hosts)

Serbian records of *T. ludeni* from sampling locations situated at latitudes between 42°N and 46°N are the northernmost distribution records of this species in the Western Palaearctic. These records are outside the species' typical biogeographic area. Herbivorous arthropod species may occur outside their biogeographic areas due to range expansion triggered by climate change and/or globalization of trade. Expansion of tropical insect and mite species into more temperate regions is a widespread phenomenon, as well as their accidental introduction, accelerated by growing international trade. Besides the impact on biodiversity, spreading or introduced alien herbivorous species may become established as pests in new environments outside their natural range (Walther et al., 2009; Hulme, 2017).

In order to investigate whether *T. ludeni* has the potential to achieve the same status as *T. urticae*, Gotoh et al. (2015) estimated the effect of temperature on development and reproduction of these two species. They found that the intrinsic rate of natural increase (r_m) of *T. ludeni* was higher than that of *T. urticae* at 25, 30 and 35°C, i.e. that the former species is better adapted to hot weather than the latter. Ristyadi et al. (2021) reported that life history traits of *T. ludeni* are highly flexible and adaptive to the dynamic thermal environment over generations. These results indicated that global warming may be the cause of its spreading biogeographic area. The dark-red spider mite does not have a diapause ability. Further research in Serbia should focus on the phenology of *T. ludeni*, and more specifically on its competition with *T. urticae* and *T. turkestani*, as well as a comparative analysis of the life history traits and population growth of these species.

ACKNOWLEDGEMENTS

This research was funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia, Grant No. 451-03-68/2022-14/200214.

REFERENCES

Baker, E.W., & Pritchard A.E. (1960) The Tetranychoid mites of Africa. *Hilgardia*, 29, 455-574. Doi: 10.3733/hilg.v29n11p455

Ben-David, T., Ueckermann, E., & Gerson, U. (2013). An annotated list of the spider mites (Acari: Prostigmata: Tetranychidae) of Israel. *Israel Journal of Entomology*, 43, 125-148. Doi: 10.13140/2.1.4235.1048

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

Davies, C.E., Moss, D., & Hill, M.O. (2004). *EUNIS habitat classification revised 2004*. Report to European Environment Agency, European Topic Centre on Nature Protection and Biodiversity.

Gotoh T., Moriya D., & Nachman G. (2015). Development and reproduction of five *Tetranychus* species (Acari: Tetranychidae): Do they all have the potential to become major pests? *Experimental and Applied Acarology*, 66, 453-479. Doi: 10.1007/s10493-015-9919-y

Hardouin, R. (1934). Un acarien très nuisible à l agriculture *Tetranychus ludeni* Zacher. *Bulletin de la Societe Entomologique de France*, *39*, 123-125.

Hulme, P.E. (2017) Climate change and biological invasions: evidence, expectations, and response options. *Biological Reviews of the Cambridge Philosophical Society*, *92*, 1297-1313. Doi: 10.1111/brv.12282

Hurtado, M.A., Ansaloni, T., Cros-Arteil, S., Jacas, J.A., & Navajas, M. (2008). Sequence analysis of the ribosomal internal transcribed spacers region in spider mites (Prostigmata: Tetranychidae) occurring in citrus orchards in Eastern Spain: use for species discrimination. *Annals of Applied Biology*, *153*, 167-174. Doi: https://doi.org/10.1111/j.1744-7348.2008.00250.x

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

Migeon, A., & Dorkeld, F. (2022) *Spider mites web: a comprehensive database for the Tetranychidae*. Retrieved from INRA-CBGP: https://www1.montpellier.inra.fr/CBGP/spmweb/ (accessed 1st October 2022)

Naves, P., Nóbrega, F., & Auger, P. (2021). Updated and annotated review of Tetranychidae occurring in mainland Portugal, the Azores, and Madeira Archipelagos. *Acarologia*, 61(2). 380-393. Doi: https://doi.org/10.24349/acarologia/20214437

Pritchard, A.E., & Baker, E.W. (1955) *A revision of the spider mite family Tetranychidae*. (Memoirs Series). San Francisco, USA: Pacific Coast Entomological Society. Doi: https://doi.org/10.5962/bhl.title.150852

Ragusa E., Sinacori M., & Tsolakis H. (2019). First record of *Tetranychus ludeni* Zacher (Acariformes: Tetranychidae) in Italy. *International Journal of Acarology*, *45*, 26-28. Doi: https://doi.org/10.1080/01647954.2018.1542456

Reck, G.F. (1959) *A key to the Tetranychoid mites – Fauna Trans. Caucasia Akad. Nauk Gruz. S.S.R.*. Tbilisi, USSR: Akademii Nauk Gruzinskoi SSR, 1.

Ristyadi, D.W.I., He, X.Z., & Wang, Q. (2021) Response to thermal environment in *Tetranychus ludeni* (Acari: Tetranychidae). *Systematic and Applied Acarology, 26*, 942–953. Doi: https://doi.org/10.11158/saa.26.5.9

Vacante, V. (2016). *The handbook of mites of economic plants: Identification, bio-ecology and control*. Wallingford, UK: CABI Publishing.

Walther, G.R., Roques, A., Hulme, P.E., Sykes, M.T., Pyšek, P., Kühn, I. ...Settele, J. (2009) Alien species in a warmer world: risks and opportunities. *Trends in Ecology and Evolution*, 24, 686-693. Doi: 10.1016/j.tree.2009.06.008

Zacher F. (1913). Untersuchungen über Spinnmilben. *Mitteilungen aus der Kaiserlichen Biologischen Anstalt für Landund Forstwirtschaft*, *14*, 37-41.

Tamnocrveni paučinar, *Tetranychus ludeni* Zacher (Acari: Tetranychidae) – nova štetna vrsta u akarofauni Srbije

REZIME

Tamnocrveni paučinar, *Tetranychus ludeni* Zacher (Acari: Tetranychidae), je izrazito polifagna vrsta i značajna štetočina privredno važnih biljaka iz familija Cucurbitaceae, Malvaceae, Fabaceae i Solanaceae koja nastanjuje tropske i suptropske oblasti. U zapadnopalearktičkom regionu, izveštaji o rasprostranjenosti ove vrste većinom dolaze iz mediteranskog bazena, odnosno iz Portugalije, Španije, Italije i Izraela. U istraživanju sprovedenom u Srbiji od 2019. do 2021. godine (na ukupno 159 lokacija), *T. ludeni* je nađena na 89 lokacija i 27 biljnih vrsta iz familija Rosaceae (8), Solanaceae (6), Cucurbitaceae (4), Fabaceae (2), Amaranthaceae (2), Asteraceae (2), Apiaceae (1), Convolvulaceae (1) and Poaceae (1). Na oko polovini lokacija uzorkovanja, tamnocrveni paučinar je nađen u mešanim populacijama sa drugim grinjama paučinarima (uglavnom *Tetranychus urticae* i *T. turkestani*). Tri biljne vrste iz familije Rosaceae: šljiva (*Prunus domestica*), trnjina (*Prunus spinosa*) i divlja jabuka (*Malus sylvestris*), predstavljaju nove domaćine. Registrovane lokacije *T. ludeni* na geografskim širinama od 42°N do 46°N najsevernije su tačke na kojima je ova vrsta nađena u zapadnopalearktičkoj zoni.

Keywords: grinje paučinari, *T. ludeni*, štetočine biljaka, rasprostranjenost, Srbija