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# New records of jumping spiders (Araneae: Salticidae) for Slovenia\*

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**Abstract.** Eight species of jumping spiders, new for Slovenian fauna have been recorded: *Aelurillus v-insignitus* (Clerck, 1758), *Icius subinermis* Simon, 1937, *Phlegra bresnieri* (Lucas, 1846), *Phlegra cinereofasciata* (Simon, 1868), *Pseudeuophrys vafra* (Blackwall, 1867), *Salticus unciger* (Simon, 1868), *Sitticus inexpectus* Logunov & Kronstedt, 1997, *Sitticus terebratus* (Clerk, 1757).

Keywords: jumping spiders, Salticidae, Slovenia

**Izveček. NOVE NAJDBE PAJKOV SKAKAČEV (ARANEAE: SALTICIDAE) V SLOVENIJI** - Prispevek obravnava osem, do sedaj v Sloveniji še neodkritih vrst pajkov skakačev: *Aelurillus v-insignitus* (Clerck, 1757), *Icius subinermis* Simon, 1937, *Phlegra bresnieri* (Lucas, 1846), *Phlegra cinereofasciata* (Simon, 1868), *Pseudeuophrys vafra* (Blackwall, 1867), *Salticus unciger* (Simon, 1868), *Sitticus inexpectus* Logunov & Kronstedt, 1997, *Sitticus terebratus* (Clerk, 1757).

Ključne besede: pajki skakači, Salticidae, Slovenija

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\* In October 2003 Luděk Jindřich Dobroruka from Prague kindly offered us his unpublished data on jumping spiders collected in Slovenia, including the previously unrecorded *Phlegra cinereofasciata* Simon, 1868. The correspondence was leading towards a joint publication on Slovenian jumping spiders, but was broken with a sudden death of our Czech colleague in July 2004. We dedicate the paper to his memory

## Introduction

With more than 5000 species (Platnick 2005), the jumping spiders (family Salticidae) represent the most diverse spider family in the World. Although most of the jumping spiders are tropical and only about 100 species are recorded in central Europe, the family is still among the numerous in Europe (Blick et al. 2004).

So far 57 species of jumping spiders have been recorded in Slovenia (Nikolić & Polenec 1981, Polenec 1982, 1988, 1992, Kuntner 1997, Fišer & Kostanjšek 2001, Kuntner & Šereg 2002). This is fairly high compared to 136 recorded species in Italy (Stoch 2003), 80 in Germany, 75 in Switzerland, 68 in Czech Republic, 74 in Slovak Republic, 71 in Austria (Blick et al. 2004), 64 in Hungary (Samu & Szinetár 1999), 82 in Croatia (Nikolić & Polenec 1981) and 49 in Serbia (Detshev et al. 2003), considering Slovenia's small area.

According to the existing checklist (Nikolić & Polenec 1981) and previous records on jumping spiders in Slovenia cited above, eight species were established to be new for Slovenian fauna and are listed here. The nomenclature follows Platnick (2005). For each species data on the collected material including the description of the collecting site (with altitude in meters, latitude and longitude in Gauss-Krüger coordinates) and the date, followed by data on distribution of the species in other countries in the area and comments on the findings are given. If not stated otherwise the specimens are deposited in the collection of Department of Biology, Biotechnical Faculty, University of Ljubljana (Oddelek za biologijo, Biotehniška fakulteta, Univerza v Ljubljani). Specimens, which were donated or obtained from other collections, are listed in the section *New records*.

## New records

### ***Aelurillus v-insignitus* (Clerck, 1757)**

#### **Material:**

1♂ on Mlake in Vipavska dolina, altitude: 210m, coordinates: y: 420408, x: 5076549, 10. 6. 2002, leg.: students of biology., det.: C. Fišer, coll.: the specimen has been donated to Manchester Museum (Dr. D. V. Logunov).

**Distribution:**

Trans-Eurasian temperate range (Logunov & Marusik 2000). The species has been recorded throughout Central Europe and in all neighboring countries (Samu & Szinetár 1999, Stoch 2003, Blick et al. 2004) except Croatia.

**Comments:**

The species can occur in grey and black color variations.

***Icius subinermis* Simon, 1937****Material:**

1♀ in garden of the restaurant »Pizzeria Lanterna« on Tržaška Road, Ljubljana, altitude: 298 m, coordinates: y: 459987, x: 5099908, 30.9.2004, leg. and det.: C. Fišer.

1♂ in apartment in Tržaška Road 117, Ljubljana, altitude: 298 m, coordinates: y: 459638, x: 5099677, 1.6. 2005 leg. and det.: C. Fišer.

**Distribution:**

Presumably western Mediterranean range (Alicata & Cantarella 1993), although the species has been found in Germany (Platnick 2005) and Switzerland (Blick et al. 2004). Italy is the only country adjacent to Slovenia in which this species has been recorded (Stoch 2003).

***Phlegra bresnieri* (Lucas, 1846)****Material:**

1♀ on Planina Zaprikraj, Kobarid, altitude: 1100 m, coordinates: y: 394392, x: 5127886, 14.7.2002, leg. and det.: C. Fišer.

2♀ at limestone cliff in Stena, Dragonja, altitude: 40 m, coordinates: y: 395504, x: 5035166, 1.5.2003, leg.: Students research camp Dekani '03; det.: R. Kostanjšek.

2♀ on Belvedere, Izola, altitude: 80 m, coordinates: y: 393734; x: 5043866, 31.5.2004, leg. and det.: C. Fišer.

1♀ on the coast near Sv. Katerina, Ankaran, altitude: 0-1 m, coordinates: y: 402308, x: 5048138, 11. 6. 2004, leg. and det.: C. Fišer. Specimens from Stena were donated to Manchester Museum (Dr. D. V. Logunov).

**Distribution:**

Mediterranean range including Southeastern Europe (Metzner 1999) and Tanzania (Platnick 2005). Recorded in Czech Republic (Blick et al. 2004), Italy (Stoch 2003) and Croatia (Nikoloć & Polenec 1981).

***Phlegra cinereofasciata* (Simon, 1868)****Material:**

1♂ in the Secnod World war concentration camp, Ljubelj, altitude: 940 m, coordinates: y: 444180, x: 5143168, 8.7.1995; leg., det. and coll.: L. J. Dobroruka.

**Distribution:**

Central Europe, eastward to the East Caucasus (Azarkina 2003). The species has been recorded in all neighboring countries, Czech Republic and Slovak Republic.

***Pseudeuophrys vafra* (Blackwall, 1867)****Material:**

1♂ in Piran, coordinates: altitude: 20 m, y: 388595, x: 5043761, 1. 10. 2001, leg. and det.: C. Fišer.

1♂ in Fiesa, Portorož, coordinates: altitude: 10 m, y: 389733, x: 5043257, 11.10.2001, leg. and det.: C. Fišer.

1♂ in Mlake, Vipavska dolina, coordinates: altitude: 210 m, y: 420408, x: 5076549, 10. 6. 2002, leg.: students of biology, det.: C. Fišer.

**Distribution:**

South European range including Azores and Madeira (Platnick 2005), with easternmost locality in the Crimean Peninsula in Ukraine (Logunov 1998). Recorded in Switzerland, Slovak Republic (Blick et al. 2004), Italy (Stoch 2003), Hungary (Samu & Szinetár 1999) and Croatia (Nikolić & Polenec 1981).

***Salticus unciger* (Simon, 1868)****Material:**

1♀ in Fiesa, Piran, altitude: 10 m, coordinates: y: 389733, x: 5043257, 28.7.2002, leg. and det.: C. Fišer.

1♀, forest along the path to cave Osapska jama, Osp, altitude: 60 m, coordinates: x: y: 411643, 5048155, 20.7.2004, leg: students summer research camp Dekani 2004, det.: C. Fišer.

Specimen from Fiesa was donated to Manchester Museum (Dr. D. V. Logunov).

**Distribution:**

Southern European range (Hansen 1994). Recorded in Italy (Stoch 2003) and Switzerland (Blick, 2004).



***Sitticus inexpectus* Logunov et Kronstedt, 1997****Material:**

1♀ collected on the coast of Cerknjiško jezero, Cerknica, altitude: 200 m, coordinates: y: 450417, x: 5069897, 10. 6. 1993, leg. M. Kuntner, det.: D. V. Logunov, coll.: M. Kuntner.

**Distribution:** Euro-Siberian to Central Asian temperate range (Logunov & Marusik 2000). The species is common in lowlands near water sources including seashores (Nentwig et al. 2003). Recorded in Germany, Poland and Austria (Blick et al. 2004).

***Sitticus terebratus* (Clerk, 1757)****Material:**

1♀ on a meadow, 50 m N from crossing for Gornja Paka at the road Črnomelj-Semič, altitude: 250 m, coordinates: y: 513692, x: 5051388, 26.7.2001, leg.: Students summer research camp Semič 2001, det.: R. Kostanjšek.

**Distribution:**

Euro-Siberian temperate range (Logunov & Marusik 2000), rarely found in northern Europe (Nentwig et al., 2003). Recorded from Germany, Switzerland, Czech Republic, Slovak Republic and Poland (Blick et al. 2004). Among adjacent countries the species has been recorded in Austria (Blick et al. 2004) and Italy (Stoch 2003).

## Discussion

Some of the species listed above, like *Aelurillus v-insignitus*, *Phlegra cinereofasciata*, and *Pseudeuophrys vafra*, were expected in Slovenia, which fits their presumable distribution range, whereas other species like *Icius subinermis* and *Salticus unciger* come as a surprise. The presence of western Mediterranean species *I. subinermis* in a garden on one of the busiest streets in Ljubljana was surprising, and the species seemed to be exotic for the area, like e.g. *Saitis barbipes* in the Netherlands (van Helsdingen 2000), or the scorpion *Euscorpius italicus* in Ljubljana (Fet et al. 2001). However, a male of *I. subinermis* collected in Ljubljana a year later indicates a more firm presence of the species in central Slovenia, representing therefore the eastern margin of the species range. The same might be true for *S. unciger*, for which Slovenia represents one of the most northern records for the species (Hansen, 1994).

With 3,2 jumping spider species per 1000 km<sup>2</sup> Slovenia is the richest country among central European and Balkan countries. Caution is recommended in such overall comparisons due to underestimation of species richness in countries with poorly known spider faunas. However, the following well studied countries may be compared to Slovenia: Germany with 0,22 species per 1000 km<sup>2</sup>, Austria (0,85) and Switzerland (1,81). The above figure may seem to indicate a well known jumping spider fauna in Slovenia. However, this may be true only for southern parts of Slovenia, where extensive field studies in Primorska region have taken place in the recent years. More species are expected in other, less studied regions in Slovenia, and our earlier prediction (Fišer & Kostanjšek 2001) on additional 20-30 species of jumping spiders for Slovenian fauna, may be even underestimated.

## Povzetek

Prispevek dopolnjuje seznam 57 poznanih vrst slovenskih pajkov skakačev z osmimi, v Sloveniji do sedaj še neodkritimi vrstami. To so: *Aelurillus v-insignitus* (Clerck, 1757), *Icius subinermis* Simon, 1937, *Phlegra bresnieri* (Lucas, 1846), *Phlegra cinereofasciata* (Simon, 1868), *Pseudeuophrys vafra* (Blackwall, 1867), *Salticus unciger* (Simon, 1868), *Sitticus inexpectus* Logunov & Kronstedt, 1997 in *Sitticus terebratus* (Clerk, 1757). S tem se skupno število poznanih skakačev v Sloveniji postopoma približuje številu skakačev v sosednjih državah z boljše raziskano favno pajkov. Kljub temu, pa lahko, ob intenzivnejši inventarizaciji pajkov, zlasti v predelih Slovenije s slaše poznano favno pajkov, pričakujemo nadaljne nove najdbe pajkov skakačev v Sloveniji.

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# Terrestrial Isopods (Isopoda: Oniscidea) from the Slovenian Karst

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**Abstract.** Hand sorting was performed in 28 habitats of the Slovenian Karst during 2004. Twenty-three terrestrial isopod species were identified, two of which proved to be new for the Slovenian fauna, namely *Trichoniscus matulici* and *Armadillidium nasatum*. Synanthropic and semi-natural sampling sites were chosen for collecting samples. The species *Orthometopon dalmatinum*, *Philoscia affinis*, *Protracheoniscus politus*, *Trachelipus ratzeburgii* were found to be common in semi natural sites, while *Androniscus roseus*, *Chaetophiloscia cellaria* and *Armadillidium vulgare* appeared frequently in synanthropic habitats. Previous investigations of the terrestrial isopod species distribution in the neighbouring northern Italian area showed higher species diversity than in Slovenian western area close to the Italian borderline. This is the reason why a higher terrestrial isopod species diversity is expected during further sampling experiments in Slovenian territory near the Italian border.

Keywords: woodlice, Slovenia, faunistics, distribution

**Izveček. KOPENSKI RAKI ENAKONOŽCI (ISOPODA: ONISCIDEA) NA OBMOČJU SLOVENSKEGA KRASA** - V 28 različnih predelih slovenskega Krasa smo jeseni leta 2004 nabrali vzorce kopenskih rakov enakonožcev. V njih smo našli 23 različnih vrst, med njimi tudi dve za Slovenijo novi vrsti *Trichoniscus matulici* in *Armadillidium nasatum*. Vzorce smo nabirali tako v habitatih v bližini človeških bivališč kot v polnaravnih habitatih. Predstavnike vrst, kot so *Orthometopon dalmatinum*, *Philoscia affinis*, *Protracheoniscus politus*, *Trachelipus ratzeburgii*, smo našli bolj v naravnih okoljih, medtem ko so predstavniki vrst *Androniscus roseus*, *Chaetophiloscia cellaria* in *Armadillidium vulgare* kazali trend večje zastopanosti v bližini človeških bivališč. Rezultati predhodnih raziskav raziskovalcev na italijanskem teritoriju omenjenega predela Slovenije so pokazali precej večjo vrstno raznolikost kopenskih rakov enakonožcev, kot je to bilo ugotovljeno na slovenskem teritoriju. Ravno zaradi tega je v prihodnosti med natančnejšimi raziskavami pričakovati tudi večjo vrstno raznolikost na slovenskem teritoriju omenjenega predela Slovenije.

Gljučne besede: raki enakonožci, Slovenija, Kras, favna, distribucija

## Introduction

Several publications on terrestrial isopods of Slovenia have been published in the last decades (Karaman 1966, Potočnik 1979, Potočnik 1980). Prior to the present study, however, faunistic data from the Slovenian Karst were generally based on woodlice of troglobiont or troglophilous nature, or on species associated with streams in the environs of caves and less known on species sampled in surface habitats. Due to the peculiar water conditions, the Karst is mostly dry, especially during the summer period, which influences the species diversity and distribution over the area.

The unique geographical and geological characteristics of the landscape drove us to perform faunistic examinations in the area. Our aim was to detect terrestrial isopods in this particular environment and to collect specimens from as many habitats as possible, paying attention to the level of human perturbation and to vegetation coverage.

## Materials and methods

### Geographical and geological features

The Karst is located in the western part of Slovenia (Fig. 1), surrounded by the Julian Alps in the north and east, and the Dinarid mountains in the south and west. The western edge is identical to the political border between Slovenia and Italy.

The geomorphology and dynamics of the area are determined by the sedimentary bedrock characteristics. The porous texture of the Mesozoic limestone and dolomite-breccia causes the immediate oozing of water to the deeper regions of the sedimental layers. Dolines and other typical Karst formations develop as a result of this process in the area. The lack of surface water causes a broad xeric environment along the Karst area indicated by xerophilous vegetation. Moreover, the area of the Karst is also influenced by the Adriatic climate with hot and dry summers followed by mild winters.

As there are no big cities in the Karst, the noticeably agricultural influences can be noticed in the landscape. Woodlands and shrubs form a diverse mosaic with pastures and vineyards. Nevertheless, rural woodlands are also located close to synanthropic sites.

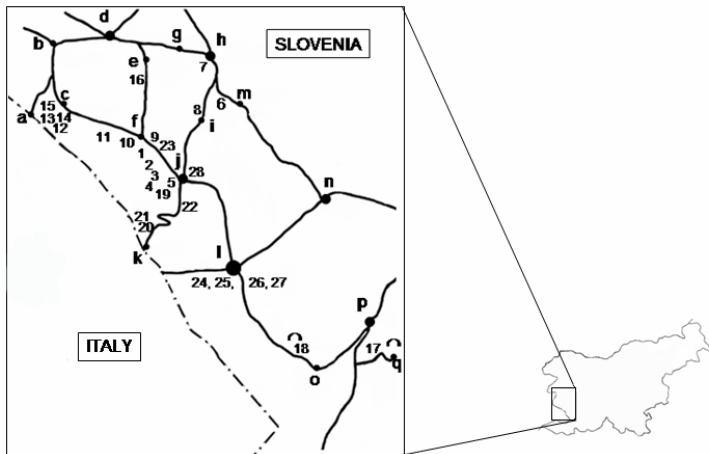


Figure 1: Map of examined area (a: Gorjansko/St. Belagio; b: Gorjansko; c: Brje pri Komnu; d: Komen; e: Gabrovica/Coljava; f: Pliskovica; g: Kobjeglava; h: Štanjel; i: Kopriva; j: Dutovlje; k: Repentabor/Monrupino; l: Sežana; m: Ponikve; n: Storje; o: Lokev; p: Divača; q: Matavun, with numbers representing localities shown in Table 1)

Slika 1: Zemljevid preiskovanega območja (a: Gorjansko/St. Belagio; b: Gorjansko; c: Brje pri Komnu; d: Komen; e: Gabrovica/Coljava; f: Pliskovica; g: Kobjeglava; h: Štanjel; i: Kopriva; j: Dutovlje; k: Repentabor/Monrupino; l: Sežana; m: Ponikve; n: Storje; o: Lokev; p: Divača; q: Matavun. Številke prikazuje lokalitete prikazane v tabeli 1)

## Habitats

Hand sorting was carried out in 13 semi-natural and 15 synanthropic habitats. Semi-natural sites are characterized by a high coverage of downy oak (*Quercus pubescens*) shrubs and woods, and Austrian pine (*Pinus nigra*) forests. Nevertheless, pine forests had a poor herb layer in contrast with the oak vegetation.

Habitats considered as synanthropic were parks, gardens, grasslands, orchards and pleated stone walls.

## Sampling method

Terrestrial isopods were collected by hand sorting (Tab. 1) during October 2004. The sampling unit was about 30 minutes. Features of the sites (e.g. vegetation, coverage, soil parameters, humidity) were also recorded for further evaluations. Identification of species was

carried out with the help of the works by Strouhal (1939), Schmölzer (1965), Gruner (1966), Schmidt (1997) and Schmalzfuss (unpubl.). The collected specimens were preserved in 70% ethanol and placed in the collection of University of Ljubljana (UL) and Szent István University, Budapest (SZIU). Nomenclature of species was used according to Schmalzfuss (2003).

Table 1: Detailed list of sampling localities and their status of urbanization  
Tabela 1: Seznam lokalitet z opisi in stopnjo urbanizacije

No.	Locality	Status	Vegetation, habitat	Elevation (m)	Altitude (E)	Latitude (N)	Date
1.	Pliskovica	A	monocot vegetation	239	13° 47'411"	45° 46'155"	13.10.2004.
2.	Pliskovica	N	downy oak forest	242	13° 48'170"	45° 45'467"	13.10.2004.
3.	Dutovlje	N	downy oak forest	255	13° 48'970"	45° 45'058"	13.10.2004.
4.	Dutovlje	N	pine forest	328	13° 49'103"	45° 44'796"	13.10.2004.
5.	Dutovlje	A	ruderal weeds, trash	271	13° 49'676"	45° 45'112"	13.10.2004.
6.	Ponikve	N	downy oak forest	285	13° 50'890"	45° 48'155"	14.10.2004.
7.	Stanjel	A	park with <i>Picea abies</i>	300	13° 50'892"	45° 49'402"	14.10.2004.
8.	Kopriva	N	disturbed pine forest	267	13° 50'032"	45° 47'144"	14.10.2004.
9.	Pliskovica	A	pleated stone wall	281	13° 49'372"	45° 46'307"	14.10.2004.
10.	Pliskovica	A	weeds and ornamental plants	252	13° 47'029"	45° 46'287"	14.10.2004.
11.	Pliskovica	N	downy oak forest	218	13° 45'983"	45° 46'229"	15.10.2004.
12.	Brje	N	downy oak forest	148	13° 46'685"	45° 46'685"	15.10.2004.
13.	Brje	N	downy oak forest	137	13° 42' 851"	45° 46'722"	15.10.2004.
14.	Brje	N	downy oak forest	244	13° 46' 540"	45° 46' 537"	15.10.2004.
15.	Brje	A	pleated stone wall	175	13° 42'853"	45° 46'704"	15.10.2004.
16.	Čoljava	A	meadow	255	13° 46'840"	45° 47'993"	16.10.2004.
17.	Škocjan	N	downy oak forest	ND	ND	ND	16.10.2004.
18.	Jama Vilenica	N	downy oak forest	ND	ND	ND	16.10.2004.
19.	Dutovlje	A	black locust + <i>Rubus sp.</i>	272	13° 49'651"	45° 45'114"	17.10.2004.
20.	Mt.Prelovec	N	downy oak forest	326	13° 49'104"	45° 43'977"	17.10.2004.
21.	Mt.Prelovec	N	pine forest	420	13° 48'842"	45° 44'077"	17.10.2004.
22.	Kreplje	A	monocot plants, weeds	275	13° 49'870"	45° 44'554"	17.10.2004.
23.	Pliskovica – Krajna Vas	A	pleated stone wall	271	13° 47'518"	45° 46'350"	18.10.2004.
24.	Sežana	A	greenhouse	340	13° 52'487"	45° 42'416"	19.10.2004.
25.	Sežana	A	bot. garden	335	13° 52'505"	45° 42'647"	19.10.2004.
26.	Sežana	A	meadow	353	13° 52'437"	45° 42'707"	19.10.2004.
27.	Sežana	A	monocot plants, weeds	325	13° 49'974"	45° 45'355"	19.10.2004.
28.	Dutovlje	A	monocot plants	285	ND	ND	19.10.2004.

N = Semi-natural shrubs and woods; A = synanthropic sites (gardens, pastures, orchards, vineyards, stone walls); ND = data missing

## Results

### Faunistic data

Twenty-three species could be detected from the observed area (Tab. 2), of which the species *Trichoniscus matulici* Verhoeff, 1901 and *Armadillidium nasatum* Budde-Lund, 1885 proved to be new to the Slovenian fauna.



Table 2: List of species and their occurrence. Literature column indicates data of presence of species in examined area: a – data from Potočnik publications (indicates the wide range of species distribution not defined exactly in Karst), b – data from Karaman publication (indicates the Karts region of collected species). Where area is clearly different than the Karst region, the collection site is added.

Tabela 2: Seznam vrst in njihova zastopanost na preiskovanih lokalitetah.

No.	Species	Literature	Number of sites
1.	<i>Titanethes sp.</i> *	a, b	27
2.	<i>Trichoniscus matulici</i> Verhoeff 1901	/	12
3.	<i>Trichoniscus illyricus</i> Verhoeff, 1931	a Žirovski vrh	6, 11, 20
4.	<i>Androniscus roseus</i> (C. Koch, 1938)	a, b	1, 21, 22, 23, 25, 26
5.	<i>Haplophthalmus fumaranus</i> Verhoeff, 1908	a Kočevje, b	4, 6, 8, 11, 12, 13, 14, 26
6.	<i>Haplophthalmus mengii</i> (Zaddach, 1844)	a	25
7.	<i>Chaetophiloscia cellaria</i> (Dollfus, 1884)	a, b	15, 23, 25
8.	<i>Philoscia affinis</i> Verhoeff, 1908	a	2, 3, 6, 12, 15, 16, 20, 22
9.	<i>Platyarthrus hoffmannseggii</i> Brandt, 1833	b Novo mesto	10, 14, 15, 16, 17, 26
10.	<i>Cylisticus convexus</i> (De Geer, 1778)	a	22
11.	<i>Porcellionides pruinosus</i> (Brandt, 1833)	a	5, 10, 19, 22, 23, 26
12.	<i>Orthometopon dalmatinum</i> (Verhoeff, 1901)	a	7, 8, 9, 10, 11, 13, 14, 15, 17, 18, 19, 23, 25, 26
13.	<i>Protracaeoniscus politus</i> (C. Koch, 1841)	a	2, 3, 4, 6, 7, 8, 12, 13, 15, 16, 17, 20, 21, 23, 25
14.	<i>Trachelipus arcuatus</i> (Budde-Lund, 1885)	a, b	1, 12, 19
15.	<i>Trachelipus rathkii</i> (Brandt, 1833)	a, b	2
16.	<i>Trachelipus ratzeburgii</i> (Brandt, 1833)	a	1, 5, 12, 13, 14, 16, 17, 20, 21, 23, 25
17.	<i>Trachelipus camerani</i> (Tua, 1900)	a	7, 18, 23
18.	<i>Porcellio marginalis</i> Budde-Lund, 1885	a	15, 23
19.	<i>Porcellio scaber</i> Latreille, 1804	a	28
20.	<i>Porcellio spinicornis</i> Say, 1818	a	9, 22, 23
21.	<i>Armadillidium frontirostre</i> Budde-Lund, 1885	a, b	10
22.	<i>Armadillidium nasatum</i> Budde-Lund, 1885	/	5
23.	<i>Armadillidium vulgare</i> Latreille, 1804	a, b	9, 10, 14, 15, 16, 17, 26

\* troglobiont species occurring on the surface

## Trichoniscidae:

### *Trichoniscus matulici* Verhoeff, 1901

Syn.: *T. omblae*, *remyi*, *sorrentinus*, *stygivagus*, *turgidus*

Distinctive male pereopodites and pleopodids of *T. matulici* are shown on Fig. 2. The species has a known distribution in Bosnia and Herzegovina, Croatia, Serbia and Montenegro and southern Italy. The examined material originated from a dry downy oak forest close to the border between Slovenia and Italy (Scmalfuss 2003).

An additional appearance of the species is known from Kranjska Gora sampled by the students\* of the University of Ljubljana.

**Examined material:** Brje, in leaf litter, 15. 10. 2004. leg. F., Vilisics, det. H., Schmalzfuss (UL, SZIU); Sundecca Jama pri Podpeci, leg. Tabor Dragonja, det. H. Schmalzfuss (UL).

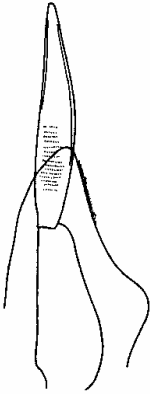


Figure 2a: Male 1<sup>st</sup> pleopodit of *Trichoniscus matulici* (Strouhal 1966)  
Slika 2a: Prvi pleopodid samca *Trichoniscus matulici* (Strouhal 1966)

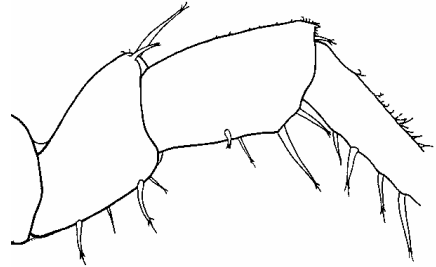


Figure 2b: Male 7<sup>th</sup> Pereiopodit of *Trichoniscus matulici* (Strouhal 1966)  
Slika 2b: Sedmi pereopodid samca *Trichoniscus matulici* (Strouhal 1966)

### **Armadillidiidae:**

#### ***Armadillidium nasatum* Budde-Lund, 1885**

Syn.: *A. mehelyi*, *nasutum*, *quadrifrons*, *sorrentinum*, *speyeri*

Distinctive male pereopodits and pleopodids of *T. matulici* are shown on Fig. 3. The species has a wide distribution in Europe in the Mediterranean and Atlantic climate, but is also known from greenhouses of Finland, Scandinavia and Central Europe (Gruner 1966, Schmalzfuss 2003), and introduced to North America (Schmalzfuss, 2003). In addition to the European data, juvenile specimens found outdoor might be a signal of the species establishment outside of a greenhouse in Hungary (Vilisics, unpubl.).

The specimens in Slovenia were found in a synanthropic habitat under rubbish, wet cardboards and bricks. However, the species could not be found in the adjacent habitats. Interestingly, a high number of juveniles were detected from the sampling site, which proves that *A. nasatum* has a reproductive period in late fall in this region.

**Examined material:** Dutovlje, ruderal meadows, under rubbish and cardboards, leg. et det. F. Vilisics, 13. 10. 2004 (UL).

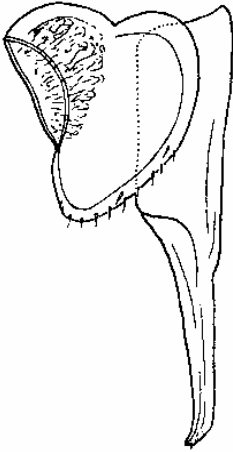


Figure 3a. Male 1st pleopod of *Armadillidium nasatum* (Gruner 1966)  
 Figure 3a. Prvi pleopodid samca *Armadillidium nasatum* (Gruner 1966)

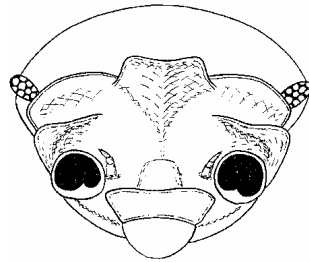
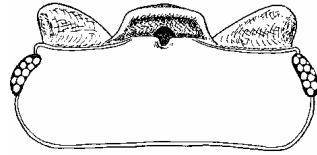


Figure 3b: Dorsal na frontal view of the head of *Armadillidium nasatum* (Gruner 1966)  
 Slika 3b: Glava *Armadillidium nasatum* (Gruner 1966)

## Discussion

Twenty-three isopod species were found in the Slovenian Karst, which is approximately 35% of the known Isopoda fauna (Lapanje, personal comm.). The list contains two species new to the Slovenian fauna, namely *T. matulici* and *A. nasatum*.

The species list contains isopods typical to the region (e.g. *H. fumaranus*, *O. dalmatinum*, *Trachelipus camerani* (Tua, 1900)), one troglobiont isopod (*Titanethes* sp.), there are species with a wide Mediterranean distribution (*C. cellaria*, *A. frontirostre*), and also Central-Eastern European (*P. politus*) and European elements (*H. mengii*, *P. affinis*), and cosmopolitan species (*A. vulgare*, *P. pruinosus*). The troglobiont isopod *Titanethes* sp. was found under stones in the botanical garden of Sežana.

We suppose that the species *H. fumaranus* and *P. affinis*, *O. dalmatinum*, *T. ratzeburgii*, *P. politus* are typical in the semi-natural habitats (dry oak woods and Austrian pine forests) of the Karst.

Pleated stone walls as ecotones are characteristic elements of the Karst and proved to be the richest in species, considering that 12 species were found in these habitats. Common species are *A. vulgare*, *P. spinicornis* and *P. marginatus*, but in the neighbourhood of

settlements the species *C. cellaria* was also common. We suppose that relative richness in species might be caused by the suitable microclimate of stone walls that had an open exposure to the sun, thus woodlice remained active and detectable even in late October.

Since *A. nasatum* occurred in a local rubbish heap, we suppose that the species is able to reproduce under outdoor conditions and the species occurrence is assumable in various localities of Slovenia.

These basic faunistic data indicate that unique species composition might be found in the Karst due to its peculiar ecological characteristics and location. Nevertheless, comparing Slovenia with Italy, its western neighbour, a high contrast can be seen in the number of species. Approximately 80% of the examined species occur in the neighbouring Italy, too (Schmalfuss 2003), thus we believe that there is a high probability that new species will be recorded in Slovenia during further faunistic investigations.

## Povzetek

Ker je predel slovenskega Krasa še precej neraziskan, kar zadeva vrstno raznolikost kopenskih rakov enakonožcev, smo jeseni leta 2004 nabrali vzorce v okoljih, kjer je vpliv človeka velik (pašniki, vinogradi, kompostniki), in v okoljih, kjer je človeški vpliv neznat. Našli smo 23 vrst (približno 34 % vseh vrst, opisanih v Sloveniji), med njimi tudi vrsti *Trichoniscus matulici* in *Armadillidium nasatum*, ki sta novi za Slovenijo. Predstavniki vrste *T. matulici* so bili najdeni v habitatih, ki ni neposredno pod vplivom človeka, predstavniki vrste *A. nasatum* pa v sinantropnih habitatih. Poleg tega smo našli na površini predstavnike rodu *Titanethes*, za katere je znano, da so troglobiontski organizmi. Rezultati so pokazali, da ima favna rakov enakonožcev na področju Krasa tako vrste, ki so razširjene v mediteranskem področju, kot tudi predstavnike vrst, ki živijo v centralno-vzhodnem delu Evrope. Značilne vrste v naravnih okoljih so bile *Orthometopon dalmatinum*, *Philoscia affinis*, *Protracheoniscus politus*, *Trachelipus ratzeburgii*, v sinantropni asociaciji pa smo našli predstavnike vrst *Androniscus roseus*, *Chaetophiloscia cellaria* in *Armadillidium vulgare*.

## Acknowledgements

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# *Andreiniimon nuptialis* (Karny, 1918), a new genus and species to the orthopteran fauna of Slovenia (Orthoptera: Phaneropteridae)

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**Abstract.** Two *Andreiniimon nuptialis* males were recorded on August 17<sup>th</sup> 2005, near Divača, south-western Slovenia. Together with a recent nearby record of the species from the vicinity of Trieste, north-eastern Italy, the new record outlines an apparently small and isolated northern population of the species and considerably extends the knowledge on its distribution range. Further field studies are needed to determine the exact distribution of the species in south-western Slovenia and north-eastern Italy, and to assess its habitat requirements and conservation status.

Keywords: grasshoppers, Slovenia, *Andreiniimon nuptialis*, distribution

**Izveček.** *Andreiniimon nuptialis* (KARNY, 1918), NOV ROD IN VRSTA ZA FAVNO KOBILIC SLOVENIJE (ORTHOPTERA: PHANEROPTERIDAE) – Dva samca vrste sta bila najdena 17 avgusta 2005 blizu Divače, jugozahodna Slovenija. Skupaj z nedavno bližnjo najdbo vrste iz okolice Trsta, severovzhodna Italija, nova najdba zaokroža domnevno majhno in izolirano severno populacijo vrste in prispeva k precej boljšemu poznavanju njenega območja razširjenosti. Za določitev natančne razširjenosti vrste v jugozahodni Sloveniji in severovzhodni Italiji ter ugotovitev njenih habitatnih zahtev in naravovarstvenega statusa so potrebne nadaljnje terenske raziskave.

Ključne besede: kobilice, Slovenija, *Andreiniimon nuptialis*, razširjenost

## Introduction

Despite the fact that the orthopteroid insects are among the very few animal groups in Slovenia to which a scientific monograph »Orthopteroid fauna of Slovenia« is devoted (Us 1992), the state of orthopterological faunistic research in Slovenia is still rather poor. The knowledge concerning the distribution, habitat requirements and biology of single grasshopper species is very scarce, and generally there are only very few published faunistic data available.

The abovementioned is confirmed by the fact that tentative field studies by younger researchers in last years have yielded more than a half dozen new grasshopper species records for Slovenia. Some of them were expected, some of them, however, are very surprising from the zoogeographical point of view. In this last category we can include the record of *Zeuneriana marmorata* (Fieber, 1853), »endemic« to the coastal part of northeastern Italy but found in Central Slovenia (Gomboc & Šegula 2005), and the record of *Metrioptera prenjica* (Burr, 1899), »endemic« to Bosnia and Montenegro but discovered in the Julian Alps (P. Veenvliet & F. Tami, pers. comm.). In this paper, yet another zoogeographical curiosity is presented – a record of *Andreiniimon nuptialis* (Karny, 1918) in southwestern Slovenia, till now thought to be »endemic« to the southern Balkans and central Italy.

## Locality data

When returning from an orthopterological field excursion to Mt. Slavnik in the late afternoon of 17<sup>th</sup> August 2005, a short stop was made in previously repeatedly visited locality near the village of Podgrad pri Vremah, 7.3 kilometres SE of Divača, southwestern Slovenia (alt. 460m, UTM VL 25). This site lies just north of the small Potok village, on a gentle slope above the Sušica stream and is bordered by two local roads, one of which heads toward the nearby village of Podgrad pri Vremah. From an orthopterological point of view, the locality is best described as »nothing special« - just a small extensive meadow on the slope, a small and almost abandoned field in the plain, all bordered with a light forest edge on one side and a rather narrow belt of dense bushes on the other. Two months earlier, some larvae of an unidentified *Isophya* species were collected at the same spot, so the main aim of this brief stop was to secure some adult specimens for taxonomic and bioacoustic studies. Due to the already late season, the search was unsuccessful in this respect.



## Results

Among other recorded grasshopper species, however, two brightly coloured males of an unknown species, sitting on bramble leaves could not escape attention of the camera and were subsequently collected (Fig. 1). A closer examination at home showed that, apart from the very specific coloration, the cerci and epiproct of these animals were so aberrant and unique that the determination of the genus and species level was straightforward. *Andreiniimon nuptialis* (Karny, 1918) - a putative endemic species originally known from the southern Balkans and central Italy - was found in Slovenia for the first time. Both collected specimens have been included in the author's private collection.

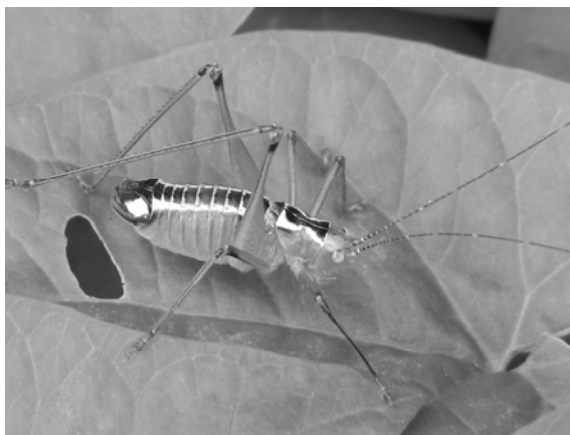


Figure 1: Male *Andreiniimon nuptialis* (17-VIII-2005; Podgrad pri Vremah, SW Slovenia; Photo: M. Bedjanič – colour photograph available on <http://www.bf.uni-lj.si/bi/NATURA-SLOVENIAE>; body length: 18 mm)

Slika 1: Samec vrste *Andreiniimon nuptialis* (17-VIII-2005; Podgrad pri Vremah, SZ Slovenija; Foto: M. Bedjanič – barvna fotografija dosegljiva na <http://www.bf.uni-lj.si/bi/NATURA-SLOVENIAE>; dolžina telesa: 18 mm)

The species could be easily determined with the help of Harz (1969). The poor outline sketches of male epiproct and cercus in this monograph give only little justice to the aberrancy and uniqueness of these structures, therefore, some macro photographs taken from frozen and well preserved material of the species are included (Figs. 2 & 3). The only good figures of head, pronotum and first abdominal segments of a male specimen, with outline drawings of its genital structures, can be found in Capra (1937). Two males from the vicinity of Divača show some differences in the shape of pronotum, epiproct and cerci, however, only on the basis of two specimens and without comparative material at hand it is difficult to judge on their eventual taxonomic relevance.

Through personal communication with Dr Roy Kleukers (Leiden, The Netherlands), it turned out that he had found the species in 1995 in northeastern Italy, at Mattonaia Triestina near Trieste (alt. 30m, UTM VL 05). This locality is only briefly mentioned beside the photograph of *Andreiniimon nuptialis* in the monograph on the orthopteroide insects of the Veneto Region (Fontana et al. 2002), but is not included in the paper on the Orthoptera of the Adriatic coast of Italy (Fontana & Kleukers 2002). It should be pointed out that the mentioned Italian and Slovenian localities are only 14 kilometres apart. Together with an outline of the known distribution range of *Andreiniimon nuptialis* in Europe, these two isolated localities on the northern border of the species range are presented in Fig. 4.



Figure 2: Epiproct and cerci of the male *Andreiniimon nuptialis* – dorsal view (Photo: M. Bedjanič; scale: 1 mm).

Slika 2: Epiprokt in cerki samca vrste *Andreiniimon nuptialis* – dorzalni pogled (Foto: M. Bedjanič; merilo: 1 mm).

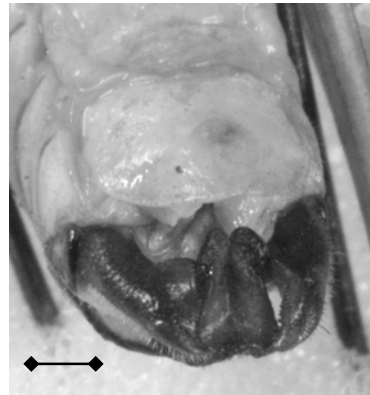


Figure 3: Epiproct, cerci and subgenital plate of the male *Andreiniimon nuptialis* – ventral view (Photo: M. Bedjanič; scale: 1 mm).

Slika 3: Epiprokt, cerki in subgenitalna plošča samca vrste *Andreiniimon nuptialis* – ventralni pogled (Foto: M. Bedjanič; merilo 1 mm).

## Discussion

The genus *Andreiniimon* Capra, 1937 is monotypic (Harz 1969, Heller et al. 1998) and is represented only by the species *A. nuptialis* (Karny, 1918). According to Harz (1969), the species is distributed only in Albania, Macedonia, Bulgaria, Greece and Italy. A single known male from central Italy was described as new genus and species *Andreiniimon permirum* by Capra (1937). In his subsequent paper, the author listed some differences between both described taxa (Capra 1946), however, ultimately *A. permirum* was synonymized by Harz

(1969) with *A. nuptialis*. As already stated in the present paper, only recently has the species been discovered also in northeastern Italy near Trieste and in southwestern Slovenia near Divača.

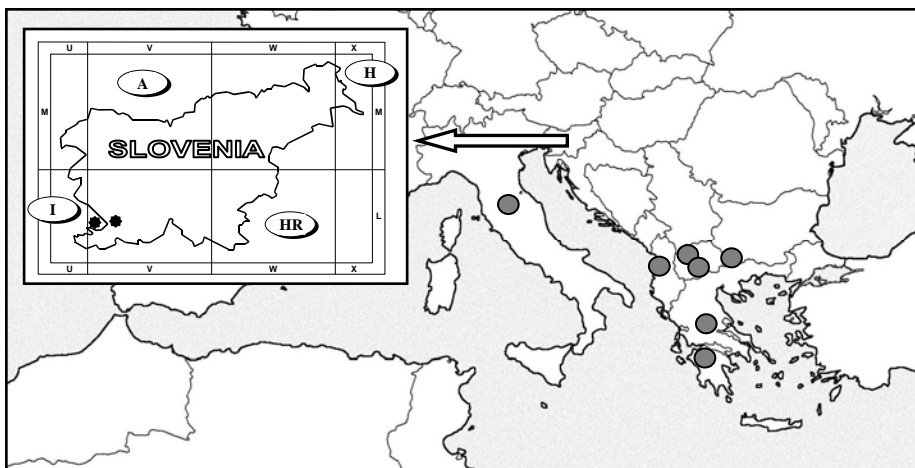


Figure 4: Known distribution of *Andreiniimon nuptialis* in Europe, with indication of two isolated localities on the northern border of its range.

Slika 4: Doslej znana razširjenost vrste *Andreiniimon nuptialis* v Evropi, s prikazom obeh izoliranih lokalitet na severnem robu njenega območja razširjenosti.

However, it is worth pointing out that for the most of the above listed countries only individual records of *Andreiniimon nuptialis* are known from the literature. In Albania, the species is known only from its type locality Durrës (Karny 1918, Harz 1969), in Macedonia it was found along the Treska River (Us & Matvejev 1967) and along the Vardar River near Miravci and Demir Kapija (Heller 1988, DORSA). The single Bulgarian record originates from Petrich (Peschev 1960 *in* Harz 1969), while in Greece the species was recorded near Koumanis on the Peloponnesus and Fthiothis in the central part of the country (Heller et al. 1989, DORSA). In the central Italian region Umbria, Capra (1937) and Capra (1946) list only Lippiano in Alta Valle Tiberina as locality of the species. Harz (1969), most probably referring to the same locality, mentions the region Tuscany, while Fontana et al. (2002) only fleetingly note that it occurs in the region Lazio and near Trieste.

Together with a recent nearby record of the species from the vicinity of Trieste, north-eastern Italy (R. Kleukers pers. comm., Fontana et al 2002), the new Slovenian record outlines an apparently small and isolated northern population of the species, and considerably extends the knowledge on its distribution range in Europe. Since both localities lie only 14 kilometres apart, they might indicate presence of a stronger *A. nuptialis* population in the northern

Dinaric region. First ad-hoc habitat analyses have not shown anything special as far as structures or other habitat characteristics are concerned. However, detailed ecological studies are needed to make any conclusions on the ecological demands of the species. It goes without saying that further field studies are urgently needed to determine exact distribution of the species in south-western Slovenia and north-eastern Italy, and to assess its conservation status.

The new record of *Andreiniimon nuptialis* is interesting from the zoogeographical point of view. In any case, it is worth noting that the far isolated northern occurrence of the species may only be apparent, especially if a rather bad orthopterological faunistic coverage of the entire western Balkan Peninsula from Croatia to Albania is taken into account. Future detailed morphological, bioacoustic and genetic studies could shed light on the degree of isolation of the newly discovered northern populations. They could also help to evaluate their taxonomic status by comparison to type and new material from the southern Balkans and central Italy.

## Povzetek

Kljub temu, da so ravnokrilci ena redkih skupin živali, katerim je v Sloveniji posvečena samostojna monografija (Us 1992), je njih favnistična raziskanost še vedno razmeroma slaba. Poznavanje razširjenosti, habitatnih zahtev in biologije posameznih vrst kobilic je zelo pomankljivo, objavljenih favnističnih podatkov pa je malo. Terensko delo mlajših raziskovalcev je v zadnjih letih prineslo najdbe več kot ducat novih vrst kobilic za favno Slovenije. Med manj pričakovane in najbolj zanimive najdbe iz zoogeografskega vidika, sodi tudi najdba vrste *Andreiniimon nuptialis* (Karny, 1918) v jugozahodni Sloveniji.

V bližini vasi Podgrad pri Vremah, 7.3 kilometrov jugovzhodno od Divače (alt. 460m, UTM VL 25), sta bila pri zaselku Potok, na ekstenzivnem travnem pobočju nad potokom Sušica, dne 17 avgusta 2005 ujeta dva pisano obarvana samčka dotlej neznane vrste (Slika 1). Podroben pregled je pokazal, da so poleg specifične obarvanosti tudi njuni cerki in epiprokt edinstveno oblikovani in dejansko brez primerjave v širšem okviru sorodnih rodov (Sliki 2, 3). S pomočjo opisov iz literature (Harz 1969) je bilo tako hitro jasno, da gre za vrsto *Andreiniimon nuptialis* – domnevno endemično kobilico iz južnega Balkana in osrednje Italije.

Kolegi iz tujine so opozorili na dejstvo, da je vrsto v severovzhodni Italiji, blizu kraja Mattonaia Triestina pri Trstu (alt. 30m, UTM VL 05), leta 1995 našel tudi dr. Roy Kleukers iz Nizozemske (R. Kleukers pisno, Fontana et al 2002). Obe izolirani lokaliteti na severnem robu območja razširjenosti vrste sta oddaljeni le 14 kilometrov zračne linije. Skupaj z doslej znano razširjenostjo vrste *A. nuptialis* v Evropi je njuna lega prikazana na zemljevidu (Slika 4).

Rod *Andreiniimon* Capra, 1937 je monotipski (Harz 1969, Heller s sod. 1998) in vključuje le vrsto *A. nuptialis* (Karny, 1918). Po podatkih iz literature je bila vrsta doslej znana iz Albanije, Makedonije, Grčije, Bolgarije in osrednje Italije (Karny 1918, Capra 1937, Capra 1946, Peschev

1960, Us & Matvejev 1967, Harz 1969, Heller 1988, DORSA). Pri tem velja posebej izpostaviti dejstvo, da so iz omenjenih držav večinoma znani le posamični favnistični podatki (Slika 4).

Novi najdbi vrste *A. nuptialis* v Sloveniji in Italiji, zaokrožata domnevno majhno in izolirano severno populacijo vrste in znatno razširjata poznavanje njenega območja razširjenosti v Evropi. Za določitev natančne razširjenosti vrste *A. nuptialis* v jugozahodni Sloveniji in severovzhodni Italiji ter ugotovitev njenih habitatnih zahtev in naravovarstvenega statusa so potrebne nadaljnje terenske raziskave. Dodatne morfološke, bioakustične in genetske raziskave ter primerjava s tipskim, novim materialom iz južnega Balkana in materialom iz osrednje Italije, bi lahko odgovorile na vprašanje o stopnji izolacije novoodkritih severnih populacij vrste in njihovem taksonomskem statusu.

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# Spodnja Klevevška jama – pomembno zatočišče netopirjev in novo najdišče dolgokrilega netopirja (*Miniopterus schreibersii*) na Dolenjskem (JV Slovenija)

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**Izvleček.** V prispevku so opisane najdbe netopirjev v Spodnji Klevevški jami. V njej smo našli porodniški koloniji južnega podkovnjaka (*Rhinolophus euryale*) in navadnega netopirja (*Myotis myotis*) ter posamezne male (*Rhinolophus hipposideros*) in velike podkovnjake (*Rhinolophus ferrumequinum*). Septembra 2004 se je v Spodnji Klevevški jami verjetno med selitvijo v prezimovališče zadrževala skupina 15 dolgokrilih netopirjev (*Miniopterus schreibersii*). To je edina najdba kolonije te vrste v novejšem času na Dolenjskem.

Ključne besede: netopirji, *Miniopterus schreibersii*, *Rhinolophus euryale*, *Myotis myotis* jame, razširjenost, kottišče, prehodno zatočišče, Slovenija

**Abstract. THE CAVE SPODNJA KLEVEVŠKA JAMA – IMPORTANT BAT ROOST AND A NEWLY RECORDED SITE OF SCHREIBER'S BAT (MINIOPTERUS SCHREIBERSII) IN DOLENJSKA (SOUTH-EASTERN SLOVENIA)** - The finds of bats in the Spodnja Klevevška jama cave are described. In it, maternity colonies of *Rhinolophus euryale* and *Myotis myotis* and individual specimens of *Rhinolophus hipposideros* and *Rhinolophus ferrumequinum* were found. In September 2004, during migration to their hibernaculum, a group of 15 Schreiber's bats (*Miniopterus schreibersii*) roosted in the cave. This is the only recent find of a colony of this species in the Dolenjska region.

Key words: bats, Chiroptera, *Miniopterus schreibersii*, *Rhinolophus euryale*, *Myotis myotis*, caves, distribution, nursery roost, transitory roost, Slovenia

Spodnja Klevevška jama pri Zburah, je izvorna vodna jama s hipotermalnimi jamskimi izviri. Leži ob potoku Radulja kakih 12 km SV od Novega mesta (sl. 1). Nad Spodnjo Klevevško jamo poteka ob prelomu suha etaža – Zgornja Klevevška jama. Jami sta nastali na otoku osamljenega krasa na južnem obrobju Krškega hribovja, zato sta eno redkih jamskih zatočišč netopirjev na širšem območju.

Zaradi zahtevnega dostopa v Spodnjo Klevevško jamo smo med prvim zimskim obiskom (1.2.1994; Kryštufek & Hudoklin 1999) pregledali le njen vhodni del. Prvi temeljiti pregled jame je bil opravljen šele 31. julija 2001, ko smo zabeležili porodniški koloniji navadnega netopirja (*Myotis myotis*, od 100 do 150 osebkov) in južnega podkovnjaka (*Rhinolophus euryale*, približno 50 osebkov).

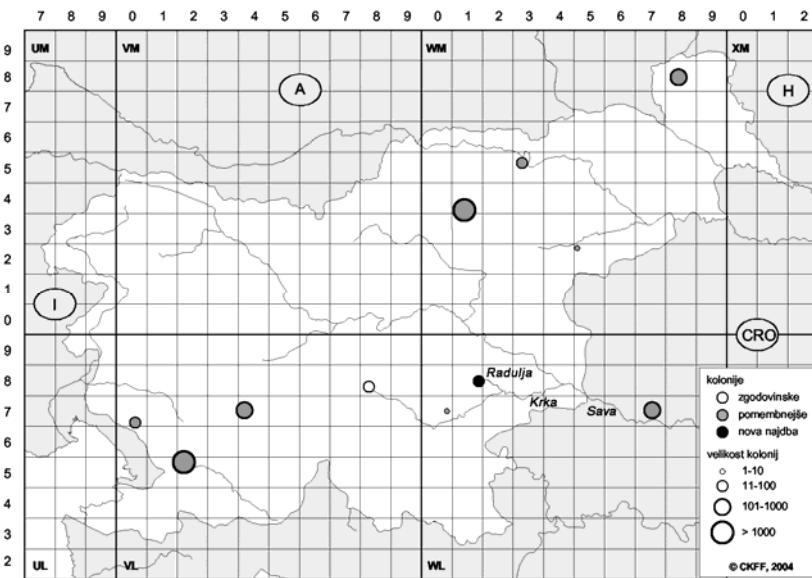
Porodniški koloniji obeh vrst, zaradi katerih sta bili jami predlagani (Kryštufek et al. 2003) in vključeni v območje Natura 2000 pSCI Radulja (Uradni list RS 46/2004), smo opazovali tudi v naslednjih poletnih sezonah (30.7.2003, 9.7.2004). Takrat smo prešteli podobno število južnih podkovnjakov kot leta 2001, navadnih netopirjev pa je bilo več – od 200 do 250 osebkov.

Zimski pregledi (1.2.1994 (Kryštufek & Hudoklin 1999), 24.12.2002, 9.2.2003) so pokazali, da jami za prezimujoče netopirje nista zelo pomembni. Opazili smo le posamezne osebe južnih, velikih (*Rhinolophus ferrumequinum*) in malih podkovnjakov (*R. hipposideros*) ter navadnih netopirjev. Dne 24. decembra 2002 smo npr. v Zg. Klevevški jami našli 3 južne, 7 malih in 3 velike podkovnjake, v Sp. Klevevški jami sta se zadrževala 2 južna podkovnjaka.

Spodnja Klevevška jama je tudi novo najdišče dolgokrilega netopirja (*Miniopterus schreibersii*), kjer smo 17. septembra 2004 pri koncu vhodnega rova opazili majhno gručo osebkov te vrste. Približno 15 otrplih (torpidnih) dolgokrilih netopirjev je viselo posamič, nekaj centimetrov drug od drugega, na višini 1,5 m od tal. Upoštevajoč znake, ki jih navaja Racey (1990), smo med štirimi natančneje pregledanimi osebkami ugotovili, da gre za dve samici, ki sta v istem letu kotili, ter dva odrasla samca pred paritvijo. V drugih delih jame se je zadrževalo še približno 100 omotičnih navadnih netopirjev, 50 budnih južnih podkovnjakov ter 2 otrpla mala in 3 veliki podkovnjaki.

Edino novejšo opažanje dolgokrilega netopirja na Dolenjskem je objavil Hudoklin (1999), ki je v Jami pod gradom Luknja 15. oktobra 1994 našel enega dolgokrilega netopirja ob skupini velikih podkovnjakov. Zatočišča dolgokrilega netopirja so sicer razpršena po Sloveniji. Pomembnejša so Škocjanske jame in Jama v Doktorjevi ogradi na Primorskem, Predjamski sistem in Planinska jama na Notranjskem, Huda luknja pri Gornjem Doliču, cerkev Sveta devica Marija v Puščavi na Koroškem, jama Belojača na Štajerskem ter Grad na Goričkem v Prekmurju (Kryštufek et al. 2003, Presetnik & Kryštufek 2004) (sl. 1). Kolonija dolgokrilega netopirja se je v 60. letih preteklega stoletja zadrževala tudi v Krški jami (Sket 1960), vendar v novejšem času dolgokrili netopirji tam niso bili opaženi, kot tudi ne med rednimi pregledi leta 1994 (Hudoklin 1999) in v letih 2002-2003 (Presetnik & Jazbec, neobjavljeni podatki).





Slika 1. Lokacije pomembnejših zatočišč dolgokrilega netopirja v Sloveniji in okolici.  
 Figure 1. Important roosts of *Miniopterus schreibersii* in Slovenia and its vicinity.  
 (Legend: circle – old record, grey dots – important recent records, black dot – new record)

Dolgokrili netopir je migratorna vrsta, ki se seli na dolge razdalje med zimskimi in poletnimi zatočišči (Rodrigues 1999, Serra-Cobo et al. 1998), vmes pa uporablja t.i. prehodna zatočišča. Jesenski čas pojavljanja dolgokrilih netopirjev v Sp. Klevelandski jami in dejstvo, da jih tam med poletnimi (31.7.2001, 9. 7.2004, 30.6.2003) in zimskimi pregledi (24.12.2002) ni bilo, nakazuje, da so dolgokrili netopirji jamo uporabili kot prehodno zatočišče. Serra Cobo et al. (2000) so dokazali, da dolgokrili netopirjem reke rabijo kot orientacijske točke, in domnevajo, da so reke tudi vodila med njihovimi selitvami. Kolonija dolgokrilih netopirjev, opažena v Sp. Klevelandski jami, je zato vzdolž dolin rek Radulje, Krke in Save morda povezana s porodniško kolonijo dolgokrilih netopirjev iz jame Veternica severno od Zagreba (sl. 1) (Farkaš-Topolnik et al. 2002).

Kar pet vrst netopirjev, ki so v Rdečem seznamu (Uradni list RS 82/2002) opredeljene kot prizadete (E), uporablja za zatočišče obe Klevelandski jami. Ti sta tako eni od naravovarstveno najpomembnejših netopirskih zatočišč v jugovzhodnem delu Slovenije in si zaslužita uvrstitev med zoološke naravne vrednote (Uradni list RS 52/2002).

Jesenska najdba dolgokrilih netopirjev v zadnjih letih razmeroma pogosto poleti in pozimi pregledanih Klevelandskih jamah dokazuje, da je za razumevanje letne dinamike netopirjev v posameznih jamah nujen redni mesečni monitoring. Za učinkovito varstvo sezonskih zatočišč ogroženih vrst netopirjev pa bi bilo nujno poznati tudi selitvene vzorce netopirjev.

## Summary

The Spodnja Klevevška jama cave is situated in isolated karst country some 10 km NE from Novo mesto along the river Radulja (Fig. 1) and constitutes, together with the adjacent cave Zgornja Klevevška otherwise rare underground habitat for this region.

Summer monitoring (carried out on 31<sup>st</sup> July 2001, 30<sup>th</sup> July 2003, and 9<sup>th</sup> July 2004) revealed that the cave was a nursery roost of *Rhinolophus euryale* (app. 50 specimen) and *Myotis myotis* (app. 200-250 specimen). Individual *Rhinolophus hipposideros* and *Rhinolophus ferrumequinum* were also noted.

During the winter (1<sup>st</sup> February 1994 (Kryštufek & Hudoklin 1999), 24<sup>th</sup> December 2002, 9<sup>th</sup> February 2003), we observed only a few specimens of every species present in the summer hibernating in the cave.

During the autumn survey (September 17<sup>th</sup> 2004), a small colony of *Miniopterus schreibersii* was observed in the Spodnja Klevevška jama cave. 15-specimens strong group of Schreiber's bat used the cave as a transitory roost. The colony may be connected with a larger one in the Veternica cave N of Zagreb in Croatia (Fig. 1) (Fakaš-Topolnik et al. 2002), and the rivers Radulja, Krka and Sava could serve as possible landmarks to migrating bats (Fig. 1).

Roosts of *Miniopterus schreibersii* are scattered in almost all parts of Slovenia (Fig. 1). Until now, however, the species has been observed only twice in Dolenjska (SE Slovenia). There has been only an old record of a colony in the cave Krška jama (Sket 1960) and a recent observation of a single specimen in the cave Jama pod gradom Luknja (Hudoklin 1999) (Fig 1).

The case of the Spodnja Klevevška jama cave shows that monthly monitoring of roosts and study of bat migratory patterns are necessary to develop effective conservation measures for endangered bat species.

## Zahvala

Del raziskave je bil opravljen med nalogo »Strokovna izhodišča za pripravo Strokovne osnove za vzpostavljanje omrežja Natura 2000: Netopirji (Chiroptera)« (Kryštufek et al. 2003), del pa med nalogo »Monitoring stanja populacij netopirjev v Ajdovski jami in na gradu Rihemberk s poskusom zagotovitve nadomestnega zatočišča« (Presetnik 2004a, b). Obe nalogi je naročila Agencija RS za okolje (Ministrstvo za okolje prostor in energijo). ARSO je dovolila tudi vznemirjanje in lov netopirjev.

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# *Psilochorus simoni* (Berland, 1911) (Araneae: Pholcidae), a new record for slovenian spider fauna from Postonjska jama cave

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**Abstract.** An adult female *Psilochorus simoni* (Berland, 1911) (Pholcidae) was found in Postojna Cave, Slovenia. The species, which originates from subtropical America, has been introduced to Europe where it is generally associated with synanthropic habitats. This is the first record of this rare species in Slovenia and the second from a cave environment in Europe.

Key words: *Psilochorus simoni*, spiders, Pholcidae, new species, Slovenia, cave

**Izvleček.** *Psilochorus simoni* (BERLAND, 1911) (ARANEAE: PHOLCIDAЕ), NOVA NAJDBA ZA FAVNO SLOVENIJE IZ POSTOJNSKE JAME - Prispevek obravnava najdbo odrasle samice pajka *Psilochorus simoni* iz družine Pholcidae v Postojnski jami. Vrsta je bila prinesena iz subtropske Amerike in je v Evropi praviloma vezana na sinantropne habitate. Najdba je prvi podatek o pojavljanju vrste v Sloveniji in šele drugi podatek iz jamskega okolja v Evropi.

Gljučne besede: *Psilochorus simoni*, pajki, Pholcidae, nova vrsta, Slovenija, jame

During a survey of cave fauna, a single adult female of *Psilochorus simoni* (Berland, 1911) was found on February 27<sup>th</sup>, 2004, in pitfall trap placed on a pile of rocks in the Postojna Cave section known as Spodnji Tartarus, located 514 m a.s.l. approximately one kilometre from the main entrance (Gauss-Krüger coordinates: x: 5071250, y: 438482). The specimen is deposited in zoological collection of the Department of Biology, Biotechnical Faculty, University of Ljubljana.

*Psilochorus simoni* exhibits general features of the family Pholcidae, like remarkably long and slender legs, heart-shaped cephalothorax and six eyes arranged in two groups. In addition to the details of the male palpus and female epigynum, the species can be distinguished from other pholcids by the weakly elevated eye region, well developed anterior

median eyes and greyish, sometimes even bluish globular opisthosoma, with spinnerets close to epigastric fold. The body length of adult spider reaches up to 3 mm.

*Psilochorus simoni* is the only member of the genus *Psilochorus* Simon, 1893 in Europe. The genus originates from subtropical America, from where the species has been unintentionally introduced to Europe (Fürst & Blandenier 1991). Therefore, the description of *P. simoni* by Berland (1911) is based on a specimen found in the basement of the University of Sorbonne in Paris. From Central France, the species has presumably spread throughout France (e.g. Denis 1960), Switzerland (Comellini 1954), Germany (Moritz 1973), Poland (Dziabaszewski 1967), Austria (Kritscher 1970), Hungary (Szinetár 1992), the Netherlands (Voosen 1983), Belgium (Ranzy & Baret 1987), Britain (Bristowe 1933), Scandinavia (Klausen 1972, Johnsson 1990) and Italy (Brignoli, 1971). According to the current data, the find in Slovenia constitutes the south-easternmost record of the species in Europe.

According to autecology of *P. simoni* (Fürst & Blandenier 1991), the species can be considered troglophilic and, as many other members of the family Pholcidae, synanthropic. Therefore, *P. simoni* is associated with dark habitats with constant yearly temperatures between 10 and 18°C. It is tolerant to low humidity independently of altitude (Fürst & Blandenier 1991). In Europe, the species has been recorded in various environments resembling the conditions listed above, like wine or cheese cellars, basements, underground shelters and other similar indoor habitats in which the spiders are usually found hanging upside down on their distinctive tangled webs (Roberts 1985). Although the species is originally troglophilic, there is only a single record of *P. simoni* from cave environment in Europe (Brignoli 1979), comparing to over 30 synanthropic records, supporting the presumed man-assisted species distribution.

Our finding of *P. simoni* deep in Postojna Cave is congruent with the proposed spreading pattern of *P. simoni* throughout Central Europe (Fürst & Blandenier 1991) and indicates that species has most probably been overlooked in synanthropic habitats in Slovenia. It also suggests that single data on the presence of *P. simoni* in cave environment by Brignoli (1979) was not accidental and indicates that beside synanthropic environments the species can also inhabit its natural habitats in Europe.

## Acknowledgments

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# First record of a melanistic Italian Wall Lizard (*Podarcis sicula*) in Slovenia

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**Abstract.** The article presents the discovery of a melanistic male Italian Wall Lizard (*Podarcis sicula*) from the vicinity of Padna in Koprsko primorje region (UTM UL93, 220 m a.s.l.). This is the first record of a melanistic Italian Wall Lizard in Slovenia.

Key words: reptiles, lacertids, Italian Wall Lizard, *Podarcis sicula*, melanism, Slovenia

**Izvleček. PRVA NAJDBA MELANISTIČNE PRIMORSKE KUŠČARICE (*Podarcis sicula*) V SLOVENIJI** – Članek opisuje najdbo melanističnega samčka primorske kuščarice (*Podarcis sicula*) iz okolice Padne v Koprskem primorju (UTM UL93, 220 m n. v.). Za zdaj je to edina znana najdba melanističnega primerka te vrste v Sloveniji.

Ključne besede: plazilci, kuščarice, primorska kuščarica, *Podarcis sicula*, melanizem, Slovenija

In Slovenia, Italian Wall Lizard (*Podarcis sicula*) is restricted to the submediterranean region, where it inhabits mostly vineyards, roadsides and urban areas, up to 200 m above sea level (Tome 1996). The species is typically green, yellowish, olive or light brown with striped pattern above and whitish or greenish underside, but the colouration is highly variable (Arnold & Burton 1978). The back pattern in the subspecies *P. sicula campestris*, which occurs in Slovenia, is usually composed of streaks and spots arranged in five longitudinal stripes on the green background (Mršič 1997).

In May 2003, approximately 500 m southeast from Padna in Koprsko primorje region (UTM UL93, 220 m a.s.l.), I found a male Italian Wall Lizard of unusual colouration (Fig. 1). The specimen was completely black on its dorsal side; however, when observed more closely, an even darker vertebral stripe could be distinguished. Ventral side of the trunk and tail was

greyish with a tinge of blue, the tail being somewhat lighter. Underside of the neck and head seemed greenish-yellow on the blackish background. The femoral pores were yellowish-orange. No spots were noticed on the underside, as is usually the case in this species. Body measurements and some other morphological parameters are given in Tab. 1.

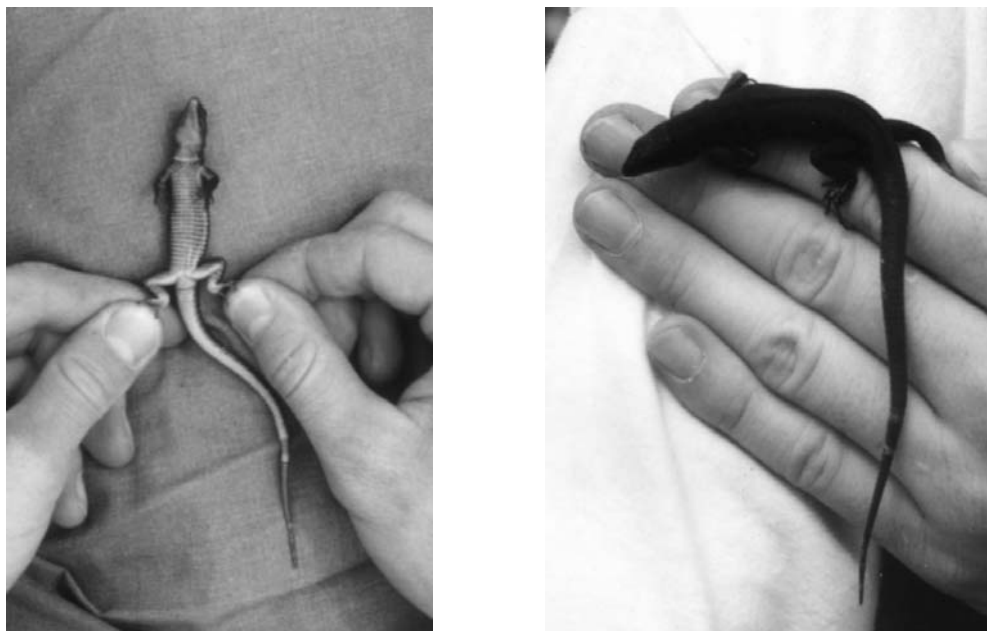


Figure 1. Melanistic form of an Italian Wall Lizard (*Podarcis sicula*) found in May 2003 near Padna (SW Slovenia); a - dorsal side, b - ventral side

Photo: K. Drenik

Slika 1. Melanistična oblika primorske kuščarice (*Podarcis sicula*), najdene maja 2003 v bližini Padne (JZ Slovenija); a - dorzalno, b - ventralno

Foto: K. Drenik

Such excessive development of the black pigment, as observed in this specimen, is characteristic of melanism. A melanistic form of Italian Wall Lizard had not been previously known in Slovenia (S. Tome, pers. comm.), which makes this find even more interesting.

Melanistic forms are most often found on islands. In several island populations in the Tyrrhenian and Adriatic areas, more or less dark coloured individuals are present (Radovanović 1951, Arnold & Burton 1978). Many hypotheses have been presented to explain this high frequency of melanistic individuals on islands, but no consensus has been reached so far (Böhme 1986).

The specimen was found on grassy forest edge along a cart-track. In the vicinity I also noticed several normally pigmented Italian Wall Lizards and a few Dalmatian *Algyroides* (*Algyroides nigropunctatus*).

Table 1: Morphological parameters of the melanistic Italian Wall Lizard (*Podarcis sicula*) from Padna.  
Tabela 1: Morfološki parametri melanističnega primerka primorske kuščarice (*Podarcis sicula*) iz Padne.

snout-vent length / dolžina glave in trupa	60,8 mm
head length / dolžina pileusa	14,8 mm
greatest head width / največja širina glave	9,8 mm
snout-collar length / razdalja od konice gobčka do roba ovratnika	23,0 mm
tail length - original / dolžina originalnega dela repa	61,9 mm
tail length - regenerated / dolžina regeneriranega dela repa	39,8
no. of collar scales / št. lusk ovratnika	11
no. of femoral pores (right/left) / št. femoralnih por (desno/levo)	21/21

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# Record of an Alpine Salamander (*Salamandra atra*) on Menišija plateau, Central Slovenia

NAJDBA PLANINSKEGA MOČERAĐA  
(SALAMANDRA ATRA) NA MENIŠIJI  
PLANINI

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On 14th August 2005 at 9 a. m., while walking over the Smrečni rob on Menišija plateau (UTM VL48, Central Slovenia), I came across an Alpine Salamander (*Salamandra atra*). It was a sunny morning after a rainy night and I found it on a tarmac road in a Dinaric mixed forest (*Omphalodo-Fagetum*) at 680 meters above sea level. The occurrence was confirmed on 11th August next year, when another (or perhaps the same) individual was found in the same locality (J. Kus Veenvliet, pers. comm.).

Most records of the Alpine Salamanders in Slovenia are known from the Julian and Kamnik-Savinja Alps, while from the Dinarides only scarce data exist, with the finds at Travnj vrh near Hotedršica and Mašun on Snežnik plateau being the closest known localities to the Menišija plateau (CKFF database, cited on 17.8.2005). Of interest is also the elevation of the new locality, since Alpine Salamanders usually inhabit areas between 800 and 2200 m a. s. l. (Veenvliet & Kus Veenvliet 2003). The find from Menišija plateau indicates that this species may be distributed throughout the Dinaric range of Slovenia to a much greater extent than suggested by current data, and that somewhat lower elevations should be considered as possible sites as well.

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