

First record of *Sauron rayi* (Araneae, Linyphiidae) in Austria

Norbert Milasowszky & Martin Hepner

doi: 10.5431/aramit4801

Abstract. *Sauron rayi* (Simon, 1881) is recorded in Austria for the first time. Male and female specimens of this rare European spider were found in two "Austrian pine forests" in Lower Austria. Data on distribution, habitat, phenology and Red List status from the Austrian localities and from published records in other countries are presented.

Keywords: arachnology, Austrian pine forest, distribution, Europe, faunistics, habitat, phenology, rare spider, Red List status

Zusammenfassung. **Erstnachweis von *Sauron rayi* (Araneae, Linyphiidae) in Österreich.** *Sauron rayi* (Simon, 1881) wurde in Österreich zum ersten Mal nachgewiesen. Männchen und Weibchen dieser seltenen Europäischen Spinne wurden in zwei Schwarzföhrenwäldern in Niederösterreich gefunden. Daten zur Verbreitung, zum Habitat, zur Phänologie und zur Gefährdung dieser Art aus den österreichischen Fundorten und von bereits publizierten Nachweisen aus anderen Ländern werden präsentiert.

Sauron rayi was originally described by Simon (1881) under the name *Erigone rayi*. The description was based on male specimens only. Simon (1881) named the species after one of its collectors, Mr. Jules Ray, who was a curator at the Museum in Troyes at that time. Later, Simon (1894) placed the species in the genus *Metopobactrus* where it remained until Marusik et al. (2001) transferred it to the genus *Sauron*, which was established some years before by Eskov & Marusik (1995). Miller (1966) initially described the female of *S. rayi* under the name *Trichopterna fratrensis*. Miller (in Weiss & Marcu 1979: 253) synonymised *Trichopterna fratrensis* (Miller, 1966) with *Metopobactrus rayi* (Simon, 1881). For a detailed overview of the taxonomic history of *S. rayi*, see Platnick (2014).

Identification

Male and female specimens of *Sauron rayi* (Simon, 1881) were identified by the present authors using keys for (Central) European spiders (Heimer & Nentwig 1991, Nentwig et al. 2013). Excellent drawings of both sexes of *S. rayi* can be found in Miller & Žitňanská (1976) and in Thaler (1993). Bosmans & Kekenbosch (2007) published copies of the drawings from Simon (1881), Miller (1966) and Miller & Žitňanská (1976).

Norbert MILASOWSZKY, Department of Integrative Zoology, University of Vienna, Althanstraße 14, A-1090 Vienna, Austria;

E-mail: norbert.milasowszky@univie.ac.at

Martin HEPNER, Department of Integrative Zoology, University of Vienna, Althanstraße 14, A-1090 Vienna, Austria;

E-mail: martin.hepner@univie.ac.at

submitted: 14.3.2014, accepted 20.6.2014, online 18.8.2014

First records in Austria

Sauron rayi has now been found in two Austrian pine forests (Seslerio-Pinetum nigrae) on Rendzina soil. Twelve males were found by means of pitfall traps in the Nature Forest Reserve "Merkenstein-Schöpf-eben" near Bad Vöslau (47°59'39"N, 16°07'42"E) at 588 m a.s.l. in the year 2004 (between 25 April and 20 November) (Fig. 1), and two males and one female were obtained by means of pitfall traps between 26 May and 23 June 2006 in the study site Stampftal near Oed (47°53'18"N, 16°01'59"E) at 640 m a.s.l. within the framework of the research programme "Soil diversity in Austrian natural forests" (DIANA) (<http://bfw.ac.at/300/2197.html>).

Distribution

Sauron rayi is a rare spider species with a scattered distribution pattern in Europe (Fig. 2). It lives in the grass and moss of open non-forest, as well as forest habitats (Svatoň et al. 2010). *S. rayi* has been reported from 14 European countries: Austria (this study), Belgium (Bosmans 2009), Bulgaria (Deltshev 2005), Croatia (Nikolić & Polenec 1981), France (e.g. Simon 1926), Germany (Staudt 2014), Greece (Buchholz 2007), Hungary (Samu & Szinetár 1999), Italy (Noflatscher 1994), Macedonia (Könnenov 2011), Poland (Staręga & Kupryjanowicz 1996), Romania (Weiss & Urák 2009), Russia (Mikhailov 2013), Slovakia (Gajdoš et al. 1999), Slovenia (Nikolić & Polenec 1981) and the Ukraine (Mikhailov 2013). A map of records of *S. rayi* was compiled by Bosmans & Kekenbosch (2007, fig. 6). Nationwide distribu-



Fig. 1: Locality “Merkenstein-Schöpfeben”, an Austrian pine forest, where *Sauron rayi* was found in the year 2004. – Photo by Alexander Pernstich, taken on 8 June 2004.

tion maps for this species are available for Germany (Staudt 2014, five records) and Slovakia (Gajdoš et al. 1999, 14 records).

Belgium: One population of *S. rayi* was found in calcareous grassland on a rocky substrate in a limestone quarry in Olloy-sur-Viroin (part of the village of Viroinval) in the Department of Namur. Specimens were collected by means of pitfall traps in May and June. In 2004, five males were found in May, 17 males and five females in June; in 2005, nine males and three females were found in May, two males in June (see Bosmans & Kekenbosch 2007, fig. 4).

Bulgaria: *S. rayi* was reported from three localities in the Sashtinska Sredna Gora Mountains (Lazarov 1998, Lazarov et al. 2001, fig. 1, Deltshev 2005). One male was found by means of pitfall traps in the area of the Chivira hut (1450 m a.s.l.) in a mountain meadow. According to Lazarov et al. (2001, fig. 1) this site is situated SW of Koprivshtitsa, a town in the Sofia Province. One male was found by means of pitfall traps in the area of Klisura (900 m a.s.l.) in a forest dominated by *Prunus cerasifera*, *Pinus nigra* and *Carpinus orientalis*. Four males and one female were collected by hand in the area of Fetentsi (880 m a.s.l.) in a forest dominated by *Quercus robur*, *Fagus sylvatica* and a meadow characterized by *Trifolium* sp., *Medicago* sp., *Vicia* sp. and *Thymus* sp. According to Lazarov et al. (2001, fig. 1) this site is situated halfway between the towns of Panagyurishte and Koprivshtitsa.

Croatia: The only record of *S. rayi* was made in Bakar [Buccari], Dalmatia, in July and was published under the name of *Metopobactrus rayi* by Chyzer & Kulczyński (1894, p.95). The collector of this single male specimen was Prof. Narcis Damin, who later also reported the record in his book of spiders from Dalmatia, Croatia, Slavonia and Istria (Damin 1900, p. 26).

France: The only records of *Sauron rayi* in France are those given in the first description of the species (Simon 1881) (see above). Accordingly, only male specimens are reported from the communes Gyé-sur-Seine and Villemaur-sur-Vanne [Villemaure] in the Aube department in north-central France.

Germany: According to Staudt (2014), there are five known records of *S. rayi*. The species is also mentioned in the check-lists and Red Lists of Baden-Württemberg (Nährig et al. 2003), Bavaria (Blick & Scheidler 2004) and Lower Saxony (Finch 2004). Joger (1997, Tab. 25) found two male specimens in a semi-dry grassland on the Weper, about 10 km west of Northeim and about 15 km north of Göttingen (Lower Saxony). Stubbemann (1980) found one male of *S. rayi* in June in the “Lorenzer Reichswald” near Nuremberg in a pine forest with grassy understorey. The second record from this area came from Kilg (2006). Bauchhenß (pers. comm.) summed up the data from Kilg (2006) as follows: *S. rayi* occurred in a pine forest on dry and nutrient poor sand in the Natural Forest Reserve “Grenzweg”/Altdorf at an elevation of 400-420 m a.s.l. Overall, three female specimens were found in June, two male and two female specimens in July and one male and one female in August by means of pitfall traps and hand sieving of litter in close vicinity to tree stems. The third record in Bavaria was made near Amberg (Oberpfalz) in an open sand habitat (Blick pers. comm.). Blick (pers. comm.) provided data for at least one male specimen which was found by Helge Uhlenhaut in 1997 at 280 m a.s.l.

Greece: Buchholz (2007) reported *S. rayi* from two localities in the Nestos Delta, which is situated in the eastern Macedonia region of north-east Greece. Buchholz (2007, Tab. 1) found one specimen in a floodplain and six specimens in forests by means of pitfall traps at an elevation of 1 to 18 m a.s.l.

Hungary: Loksa (1966) reported *S. rayi* from two areas: (i) the Bükk Mountains and (ii) the Aggtelek Karst [Tornaer Karst] both of which are part of the north Hungarian Mountains of the Inner

Western Carpathians. In the Bükk Mountains, *S. rayi* was found at the localities Molnár rock, Bélkő and Szarvaskő. In the Aggtelek Karst area [Tornaer Karst], *S. rayi* was found at the localities Alsó hill and Nagyoldal. Loksa (1966, Tables 55 and 61) reported *S. rayi* exclusively from xerothermic oak wood (*Ceraso mahaleb-Quercetum clematidetosum nigrae*) on limestone and Gabbro-Rendzina at an altitude between 280 and 600 m a.s.l.

Italy: Noflatscher (1993) as well as Thaler (1993) reported *S. rayi* from South Tyrol (Alto Adige) on southern slopes between Naturns and Mals at an elevation between 700 and 1350 m a.s.l. *S. rayi* was found in three habitats at the “Vinschgauer Sonnenberg”: (i) a chestnut (*Castanea sativa*)-forest, (ii) a dry grassland and (iii) a rock steppe. Furthermore, Thaler (1993) reported five males and two females in June and one male in July.

Macedonia: Komnenov (2011) found two male and two female specimens of *S. rayi* in a xerothermic oak-hornbeam forest (*Quercus-Carpinetum orientalis*) by means of pitfall traps between 3 May and 12 June at 889 m a.s.l. near Leshki in the Osogovo Mountains.

Poland: Starega & Kupryjanowicz (1996) reported *S. rayi* from the Gorce Mountains which are situated in Małopolska Province at the western tip of the long Carpathian range. Here, one male specimen was found in June in an abandoned ant-nest in a spruce forest (*Piceetum taticum*) located in the Studniska slope in the Jaszcze valley at 850 m a.s.l.

Romania: Weiss & Marcu (1979) reported *S. rayi* from the river dune reserve of Hanu Conachi (district Galati). Here, one male specimen each was found in an oak-forest (*Quercetum pedunculiflorae*) and dry grassland (*Achilleo (kitaibelianae)-Secalinetum silvestris*). The two specimens were found in April and June.

Russia: Ponomarev & Dvadenko (2012, p. 47) provided the following data concerning records of *S. rayi* from Russia: three females, Rostov region, Razdorskaya village, locality “Atamanskaya balka”, 25 May-16 June 2001; one female, locality “Pukhlyakovskiy sklony (= Puhlyakovsky slopes), in a steppe meadow with bushes, 15-20 May 2004, two males, *ibid.*, in a forest belt, 31 May-9 June 2004; one male, Krasnodar region, Kushchovskaya village, in a tree plantation, 22 April-4 May 2004, six males, three females, *ibid.*, 4 May-1 June 2004; two males, one female, Krasnodar region, Anapa village, locality



Fig. 2: Distribution map of *Sauron rayi*. Small black dots represent records of *Sauron rayi*; the single large black dot comprises several localities in Slovakia shown in insert (upper left corner).

“Bolshoy Utrish” (= Big Utrish), Vodopadnaya Valley, in an oak-hornbeam-forest (*Quercus* sp., *Carpinus orientalis*), in forest litter along the stream, 2 May 2010; the latter records from the locality “Bolshoy Utrish” are also mentioned in Ponomarev & Volkova (2013, p. 236).

Slovakia: Miller (1966) found two females of *S. rayi* on 1 September 1935 on Malý Kriváň in the Malá Fatra Mountains (near Liptovská Mara) in grassland above the tree line. Additionally, Miller & Žitňanská (1976) reported the record of one male on a south-orientated grassy slope (forest edge, Žitňanská 1981) of Váh near Vlašky on 23 May 1972. On 10 July 1974, the two authors additionally found three males and eight females on a south-west-orientated slope of Ostrá (Suchý Jasienok) in the Veľká Fatra. Miller & Žitňanská (1976) considered *S. rayi* to be a species that is bound to sunny submontane mountain slopes which are covered with grass. The habitat of the locality Vlašky is a xerophilous mountain meadow mainly covered with *Brachypodium pinnatum*, the locality Suchý Jasienok is a steep limestone slope covered sparsely with scattered grass cushions and lichens on rock boulders and stones. Thus, Miller & Žitňanská (1976) classified *S. rayi* as photophilic-hemiombrophilic. Svatoň (1983a) found several specimens of *S. rayi* on a grassy hillside below the summit of the Čierny kameň in the State Nature Reservation Čierny kameň in the Veľká Fatra

Mountains. Svatoň (1983b) reported *S. rayi* from the Nízke Tatry [Low Tatra], where he found two males and three females on 25 August 1980 by means of pitfall traps in Ohnište, Pod Mníchom, in a limestone forest steppe on a south-orientated slope. The same record is mentioned by Svatoň (1989) with more detailed information on the forest stand that consists of *Pinus silvestris*, *Pinus nigra* and *Larix decidua*. Additionally, Svatoň (1989) also reported *S. rayi* from a second study site in the nature protection area Ohnište: on 9 July 1981, he found one male at the edge of a rock steppe islet, just above the Púchalky valley. Svatoň (1985) reported *S. rayi* from a grassy hillside in the Suchý Nature Reserve in the Malá Fatra [Little Fatra]. Previously, Miller (1966) reported *S. rayi* from the Malý Kriváň [Little Kriváň] in the Malá Fatra. Žitňanská (1988) recorded *S. rayi* from Dedinky, about 4 km north of Dobšiná in the protected landscape area Slovenský Raj. Here, she found one male by means of pitfall traps at 850 m a.s.l. at the border of a mixed forest with an adjacent SW slope covered by a thin growth of young *Picea excelsa*, *Juniperus communis* and deciduous trees on Mesozoic limestone and dolomite ground. Franc & Hanzelová (1995a, b, 1997) reported *S. rayi* from the Pohanský hrad Nature Reserve near Hajnáčka. Here, one male was found at 29 May 1995 in a pseudocarst cave of a south-orientated boulder scree slope at about 500 m a.s.l. Gajdoš et al. (1999, p. 110) assembled all records of *S. rayi* (Nr. 2910), i.e. 14 records of *S. rayi* from eight different geomorphological units. Later, Krajca & Svatoň (1999) reported *S. rayi* from rock (dolomite and limestone) forest-steppes in the National Nature Reserve Roszutec in Mala Fatra Mountains. One male specimen was collected in the locality Poludňové skaly at 965 m a.s.l. and three females were found in the locality Medziholie at 1170 m a.s.l.

Slovenia: Polenec (1978) found six male specimens of *S. rayi* in a xerothermic hophornbeam-forest (*Sesleria autumnalis*-*Ostryetum carpinifoliae*) near Podgorje village (510 m a.s.l.) at the SW slope of the Slavník, which is the highest peak (1028 m a.s.l.) of the North Istrian Karst-Mountains in Slovenia. Unfortunately, Polenec (1978) failed to report the exact position and elevation of the study site.

Ukraine: In the Ukraine, *S. rayi* was mentioned from the Crimean Peninsula (Gnelitsa 2004, Kovblyuk et al. 2008) and from Eastern Ukraine (Prokopenko, pers. comm.: left-bank Ukraine: Polchaninova

& Prokopenko 2013, Polchaninova & Prokopenko 2006, sub *Sauron fissocornis* Eskov, 1995; Prokopenko 2003, sub *S. fissocornis*). In the Crimean Peninsula *S. rayi* has recently been reported from the Karadag Nature Reserve (Gnelitsa 2004, Kovblyuk et al. 2008). Kovblyuk (pers. comm.) reported that he and Nicolai N. Yunakov collected seven males and three females of *S. rayi* in the Karadag Nature Reserve by sifting between 28 and 31 May 2010. In left-bank Ukraine, data on numbers of *Sauron rayi* specimens are only given in Prokopenko (2003, sub *S. fissocornis*). Prokopenko (pers. comm.) provided full information about these records which were obtained in two different localities: (i) one female from the Donetsk region, in an artificial tree plantation ("Rakovka") in the city of Donetsk, between 14 and 21 June 2001; (ii) one male, five females between 11 and 22 June 2001 and one female between 19 and 22 June 2008 in a forest belt in the Bilosaraiska Kosa village of the Per-shotravnevyi district.

Habitat

S. rayi has been reported from forests and open non-forest habitats. It can be considered a thermophilic spider due to its occurrence in xerothermic habitats, such as xerothermic oak wood (e.g. Loksa 1988), dry pine-forest (e.g. Stubbemann 1980), chestnut (*Castanea sativa*) forest (e.g. Noflatscher 1993) or xerothermic hophornbeam forest (e.g. Polenec 1978). The open non-forest habitats also include a variety of xerothermic sites, such as calcareous grassland, dry grassland, rock steppe, xerophilous mountain meadow and even a limestone slope covered sparsely with scattered grass cushions and lichens. Accordingly, the soils of these habitats are poor in nutrients, and the prevalent soil type is Rendzina mostly associated with limestone or dolomite bedrock. Due to its occurrence in a cave, Franc & Hanzelová (1995b, 1997) considered *S. rayi* to be a glacial relict. Interestingly, the temperature in the lowest parts of pseudocarst caves never exceeds 9–10°C and the air has a high humidity (Franc & Hanzelová 1995b). However, the surface of the scree slope is covered by xerothermic forests and rocky steppes, and this area hosts thermophilic spider species (Franc & Hanzelová 1995b). Therefore, Svatoň (2000) classified *S. rayi* as a troglone species, because it is not a permanent cave inhabitant, but accidentally enters caves through the cracks and crevices of the surrounding bedrock.

Altitude

S. rayi was found from nearly sea level at 1–18 m a.s.l. in the Nestos Delta in Greece (Buchholz 2007) to a maximum of 1450 m a.s.l. in the Sredna Gora Mountains in Bulgaria (Lazarov et al. 2001). On the one hand, there are many records from other Mountain areas, such as the Eastern Alps (Austria), the Southern Alps (Italy), the Bükk Mountains (Hungary), the Osogovo Mountains (Macedonia), the Gorce Mountains (Poland), the Big and Little Fatra mountains and the Low Tatra Mountains (Slovakia), the North Istrian Karst-mountains (Slovenia) and the Caucasus (Russia). On the other hand, *S. rayi* was also found in lowland areas, such as the Russian Plain (Mikhailov 2013).

Phenology

In the literature, males of *S. rayi* are reported from April to August, females from May to September. The activity peak of males and females is in June (Fig. 3). Thus, *S. rayi* can be considered a stenochronous species with an activity peak the late spring and early summer (main activity period May, June and July). The two males and the one female in Austria perfectly fit into this picture as they were caught in a sampling period between 26 May and 23 June.

Red List

In the Red List of spiders of Baden-Württemberg (Germany), *S. rayi* is classified as extremely rare (Nährig et al. 2003). In Bavaria (Germany) it is categorized as Endangered (Blick & Scheidler 2004). In the new Red List of German spiders the species is categorized as Endangered and Very Rare (Blick et al. in press). In Lower Saxony, *S. rayi* is placed in the category Data Deficient (Finch 2004). In South Tyrol (Italy), Noflatscher (1994) also classified *S. rayi* as Endangered (Category 2). In Slovakia, Gajdoš et al. (1999) categorized *S. rayi* under LC (Least Concern)/NT (Near Threatened), due to its occurrence in at least 11 square grids across the whole country. Currently, Slovakia is the country with the most records of *S. rayi*.

Acknowledgements

This study was carried out with the financial support of the Federal Ministry of Agriculture, Forestry, Environment and Water Management (GZ: 42.4210/10-IV 2/2003) within the framework of the research programme “Soil diversity in Austrian natural forests” (DIANA) ([http://bfw.](http://bfw.ac.at/300/2197.html)

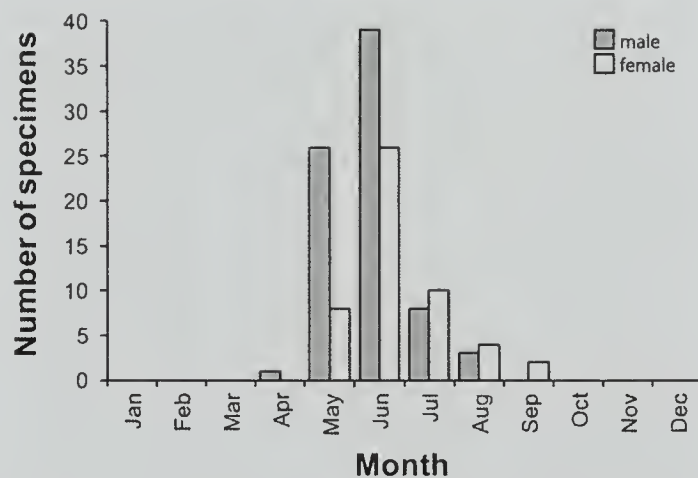


Fig. 3: Phenology of *Sauron rayi*. Grey bars = males (N=77), white bars = females (N=50). All available data from the literature and the present study are represented.

ac.at/300/2197.html). We would like to express our gratitude to Sophie Zechmeister-Boltenstern who laid the foundation of this study while leading the DIANA-project. We are also grateful to Franz Starlinger for sharing his forest expertise and to John Plant for checking the English. Finally, we wish to thank Helene Prokopenko, Mykola Kovblyuk and Alexander Ponomarev for providing literature pertaining to records from Russia and the Ukraine, and Stefan Otto for information concerning the records from the Caucasus.

References

- Blick T, Finch O-D, Harms KH, Kiechle J, Kielhorn KH, Kreuels M, Malten A, Martin D, Muster C, Nährig D, Platen R, Rödel I, Scheidler M, Staudt A, Stumpf H & Tolke T in press Rote Liste und Gesamtartenliste der Spinnen (Arachnida: Araneae) Deutschlands. 3. Fassung, Stand April 2008, einzelne Änderungen und Nachträge bis Mai 2014. – Naturschutz und Biologische Vielfalt 70(4)
- Blick T & Scheidler M 2004 Rote Liste gefährdeter Spinnen (Arachnida: Araneae) Bayerns. – Schriftenreihe des Bayerischen Landesamtes für Umweltschutz 166 (2003): 308–321
- Bosmans R 2009 Een herziene soortenlijst van de Belgische spinnen (Araneae). – Nieuwsbrief van de Belgische arachnologische Vereniging 24: 33–58
- Bosmans R & Kekenbosch R 2007 *Sauron rayi* (Simon, 1881), het Duivelspinnetje, een nieuwe Midden-Europese spinnensoort voor het eerst in België waargenomen. – Nieuwsbrief van de Belgische arachnologische Vereniging 22: 31–37
- Buchholz S 2007 A first contribution to the arachnofauna (Arachnida: Araneae) of the Nestos delta (NE Greece). – Acta zoologica bulgarica 59: 241–252
- Chyzer C & Kulczyński W 1894 Araneae Hungariae. Vol. 2. Academiae Scientiarum Hungaricae, Budapest. pp. 1–151, Tab. I–V

- Damin N 1900 Pauci Dalmacije, Hrvatske, Slavonije i Istre: (Araneae Dalmatiae. Croatiae, Slavoniae et Istrae, partim editae, partim usque ad a. 1900 ineditae.) – Rad Jugoslavenske akademije znanosti i umjetnosti. Matematičko-prirodoslovni razred 143: 10-53
- Deltshev C 2005 A review of the family Linyphiidae (Araneae) in Bulgaria, faunistic and zoogeographical analyses. In: Logunov DV & Penney D (eds.) European Arachnology 2003 (Proceedings of the 21st European Colloquium of Arachnology, St.-Petersburg, 4-9 August 2003). – Arthropoda Selecta, Special Issue 1: 79-82
- Eskov KY & Marusik YM 1995 On the spiders from Saur Mt. range, eastern Kazakhstan (Arachnida: Araneae). – Beiträge zur Araneologie 4 (1994): 55-94
- Finch O-D 2004 Rote Liste der in Niedersachsen und Bremen gefährdeten Webspinnen (Araneae) mit Gesamtartenverzeichnis. – Informationsdienst Naturschutz Niedersachsen, Supplement zu 5/2004 1-20
- Franc V & Hanzelová A 1995a Pavúky (Araneida) Cerovej vrchoviny. In: Krištín A & Gaálová K (eds.) Rimava 1995 Odborné výsledky zoologických a mykologických výskumov. SAŽP Banská Bystrica, Správa CHKO Cerová vrchovina Rimavská Sobota, Ústav ekológie lesa SAV Zvolen. pp. 25-43
- Franc V & Hanzelová A 1995b New and remarkable findings of spiders (Araneida) in pseudokarst caves of the „Pohanský hrad“ Nature Reservation. In: Gaál L (ed.) Preservation of pseudokarst caves. Proceedings of the International Working Meeting, SAŽP, Banská Bystrica. pp. 99-103
- Franc V & Hanzelová A 1997 New and remarkable findings of spiders (Araneida) in Slovakia and their ecosozological value. – Acta Universitatis Carolinae, Biologica 40: 365-382
- Gajdoš P, Svatoň J & Sloboda K 1999 Katalóg pavúkov Slovenska. Catalogue of Slovakian spiders. Ústav krajinej ekológie Slovenskej akadémie vied, Bratislava. 337 pp.
- Gnelitsa V 2004 Preliminary data on the Linyphiidae spiders studying in Karadag Nature Reserve. In: Karadagsky Prirodny zapovednik UNAN, Letopis prirody, Sonat, Simferopol. pp. 135-138 (in Russian)
- Heimer S & Nentwig W 1991 Spinnen Mitteleuropas. Ein Bestimmungsbuch. Parey, Hamburg. 543 pp.
- Joger HG 1997 Untersuchungen zur epigäischen Fauna von Halbtrockenrasen: Anpassungen von Spinnen und Insekten an einen Extrem-Lebensraum. Cuvelier, Göttingen. [Dissertation University Göttingen 1995]. 226 pp.
- Kilg M 2006 Straten- und aktivitätenbezogene Analyse ausgewählter Arthropodengruppen eines naturnahen Kiefernwaldes. Diploma thesis, University Erlangen-Nürnberg. 109 pp.
- Kommenov M 2011 Fauna Paukova (Arachnida, Araneae) Osogovskih Planina. Master thesis, University Crne Gore. 203 pp.
- Kovblyuk MM, Kukushkin OV, Gnelitsa VA, & Nadolny AA 2008 Brief atlas of spiders (Arachnida, Aranei) of Karadag Nature Reserve. Simferopol, N.Oriadna. 120 pp. (in Russian)
- Krajca A & Svatoň J 1999 The epigeic spider fauna (Araneae) in meadow, forest-steppe and forest ecosystems of the National Nature Reserve Rozsutec in Malá Fatra Mts. (Slovakia) in comparison 1972-73 and 1996-98. In: Tajovský K & Pižl V (eds.) Soil zoology in Central Europe, Česke Budejovice. pp. 169-176
- Lazarov S 1998 A contribution to the study of the spiders (Araneae) in Sushtinska Sredna Gora Mountains, Bulgaria. – Historia naturalis bulgarica 9: 27-34
- Lazarov S, Deltshev C & Blagoev G 2001 The spiders (Araneae) of Sashtinska Sredna Gora mountain (Bulgaria). Faunistic and zoogeographical analysis. – Acta zoologica bulgarica 53: 3-28
- Loksa I 1966 Die bodenzoozönologischen Verhältnisse der Flaumeichen-Buschwälder Südostmitteleuropas. Akadémiai Kiadó, Budapest. 437 pp.
- Loksa I 1988 Über einige Arthropoden-Gruppen aus dem Biosphäre-Reservat des Pilis-Gebirges (Ungarn). – Opuscula Zoologica Budapest 23: 159-176
- Marusik YM, Koponen S & Danilov SN 2001 Taxonomic and faunistic notes on linyphiids of Transbaikalia and south Siberia (Araneae, Linyphiidae). – Bulletin of the British arachnological Society 12: 83-92
- Mikhailov KG 2013 The spiders (Arachnida: Aranei) of Russia and adjacent countries: a non-annotated checklist. Arthropoda Selecta. Supplement No.3, Moscow: KMK Scientific Press Ltd. 262 pp.
- Miller F 1966 Einige neue oder unvollkommen bekannte Zwergspinnen (Micryphantidae) aus der Tschechoslowakei (Araneidea). – Acta entomologica bohemoslovaca 63: 149-164
- Miller F & Žitňanská O 1976 Ein Beitrag zur Kenntnis der slowakischen Spinnenfauna. – Biológia (Bratislava) 31: 313-318
- Nährig D, Kiechle J & Harms KH 2003 Rote Liste der Webspinnen (Araneae) Baden-Württembergs. – Naturschutz-Praxis Artenschutz, Karlsruhe 7: 7-162 & 181-199
- Nentwig W, Blick T, Gloor D, Hänggi A & Kropf C 2013 Spiders of Europe, version 06.2013. – Internet: <http://www.araneae.unibe.ch> (14.6.2013)
- Nikolić F & Polenc A 1981 Catalogus Faunae Jugoslaviae. Aranea. Consilium Academicarum Scientiarum Rei Publicae Socialisticae Foederativae Jugoslaviae, Ljubljana. 135 pp.
- Noflatscher MT 1993 Beiträge zur Spinnenfauna Südtirols-IV: Epigäische Spinnen am Vinschgauer Sonnenberg (Arachnida: Aranei). – Berichte des naturwissenschaftlich-medizinischen Vereins in Innsbruck 80: 273-294
- Noflatscher MT 1994 Rote Liste der gefährdeten Spinnen (Arachnida: Aranei) Südtirols. In: Gepp J (Projektleiter) Rote Liste der gefährdeten Tierarten Südtirols. Autonome Provinz Bozen-Südtirol, Amt für Landschaftspflege. pp. 334-375
- Platnick NI 2014 The world spider catalog, version 14.5. American Museum of Natural History. – Internet: <http://>

- research.amnh.org/entomology/spiders/catalog/index.html (8.5.2014)
- Polchaninova NY & Prokopenko EV 2006 History of study and a brief survey of the araneofauna of the Left-Bank Ukraine. In: Deltshv C & Stoev P (eds.) European Arachnology 2005. Acta zoologica bulgarica. Supplement 1: 269-280
- Polchaninova NY & Prokopenko EV 2013 Catalogue of the spiders (Arachnida, Aranei) of Left-Bank Ukraine. Arthropoda Selecta. Supplement No. 2, Moscow: KMK Scientific Press Ltd. 268 pp.
- Polnec A 1978 Zusammensetzung und Besonderheiten der epigäischen Spinnenfauna des Seslerio-Ostryetum am Berge Slasnik (1028m) (Nord Istrien, Jugoslawien). – Symposia of the Zoological Society of London 42: 367-377
- Ponomarev AV & Dvadenko KV 2012 Notes on taxonomy and spider fauna (Aranei) of Southern Russia and Western Kasakhstan. – The South of Russia: ecology, development 4: 42-53 (in Russian)
- Ponomarev AV & Volkova DD 2013 The first results of the study of spiders (Aranei) fauna of the Abrau Peninsula. In: Malkhazova SM & Velitshko SC (eds.) Biodiversity of the state nature reserve "Utrish". Scientific studies/works, Volume 1 (2012), Anapa. pp. 228-247 (in Russian)
- Prokopenko EV 2003 Structure of spider community (Aranei) of the herpetobium of tree plantations in North Priezovje. Problems of Ecology and Nature Protection of technogenic region. Scientific and practical journal. Donetsk: DonNU. Issue 3: 154-157 (in Russian)
- Prokopenko EV 2013 State of knowledge of spiders (Aranei) from protected areas in the south-east of Ukraine. From conservation to sustainable nature. Materials of the International Science Conference (Donetsk, 20-22 March 2013). pp. 78-81 (in Russian)
- Samu F & Szinetár C 1999 Bibliographic check list of the Hungarian spider fauna. – Bulletin of the British arachnological Society 11: 161-184
- Simon E 1881 Description d'espèces nouvelles du genre Erigone. – Bulletin de la Société zoologique de France 6: 233-257
- Simon E 1894 Histoire naturelle des araignées. Deuxième édition. Part 1 (3). Roret, Paris. pp. 489-760
- Simon E 1926 Les arachnides de France, Tome VI. Synopsis générale et catalogue des espèces françaises de l'ordre des Araneae, 2e partie. Roret, Paris. pp. 309-532
- Staręga W & Kupryjanowicz J 1996 Beitrag zur Kenntnis der Spinnen des Gorce-Gebirges. – Fragmenta Faunistica (Warszawa) 39: 313-328
- Staudt A 2014 Nachweiskarten der Spinnentiere Deutschlands (Arachnida: Araneae, Opiliones, Pseudoscorpiones). – Internet: <http://spiderling.de/arages/Verbreitungskarten/species.php?name=sauray> (8.5.2014)
- Stubbemann HN 1980 Ein Beitrag zur Faunistik, Ökologie und Phänologie der Bodenspinnen des Lorenzer Reichswalds bei Nürnberg (Arachnida). – Spixiana 3: 273-289
- Svatoň 1983a Fauna pavúkov (Arachnida: Araneae) štátnej prírodnej rezervácie Čierny kameň vo Veľkej Fatre [Spider fauna (Arachnida, Araneae) of the State Nature Reservation Čierny Kameň in the Veľká Fatra mountains]. – Ochrana prírody 4: 119-134
- Svatoň J 1983b Weitere neue oder unvollkommen bekannte Spinnenarten aus der Slowakei. – Biológia (Bratislava) 38: 569-580
- Svatoň J 1985 K poznaniu pavúkov (Arachnida: Araneae) štátnej prírodnej rezervácie Suchý v Malej Fatre [Deeper knowledge of spiders (Arachnida: Araneae) of the State Nature Reserve Suchý in Malá Fatra]. – Ochrana prírody 6: 113-133
- Svatoň J 1989 K poznaniu pavúkov (Araneae) ŠPR Ohnište v Nízkych Tatrách [Towards the knowledge of spiders (Araneae) in the SPR Ohnište in the Low Tatras]. – Stredné Slovensko 8: 101-114
- Svatoň J 2000 Fauna pavúkov (Araneae) slovenských jaskýň [Spider fauna (Araneae) of Slovak caves]. In: Mock A, Kováč L & Fulín M (eds.) Fauna jaskýň (Cave fauna). East Slovakian Museum, Košice, pp. 157-170
- Svatoň J, Gajdoš P, Černecká L, Franc V, Korenko S, Kovalčík R & Krumpálová Z 2010 Pavúky (Aranea). In: Mašán P & Mihál I (eds.) Pavúkovce Cerovej vrchoviny [Arachnids of the Cerová vrchovina highland]. Banská Bystrica: Štátna ochrana prírody SR, Banská Bystrica. Správa CHKO Cerová vrchovina, Rimavská Sobota Ústav zoológie SAV, Bratislava. Ústav ekológie lesa SAV, Zvolen. pp. 21-124
- Thaler K 1993 Über wenig bekannte Zwergspinnen aus den Alpen - IX (Arachnida: Aranei, Linyphiidae: Erigoniinae). – Revue suisse de Zoologie 100: 641-654
- Weiss I & Marcu A 1979 Aranee si opilioniide epigeie din rezervatia de dune fluviale de la Hanu Conachi. – Studii și comunicări Științe naturale Muzeul Brukenthal 23: 251-254
- Weiss I & Urák I 2009 Faunenliste der Spinnen Rumäniens [Checklist of the Romanian spiders (Arachnida: Araneae)]. – Internet: <http://www.arachnologie.info/fauna.htm> (8.5.2014)
- Žitňanská O 1981 Zusammensetzung der Lebensgemeinschaften der Spinnen (Araneida) in dem Gebiet Liptovská Mara. – Acta Facultatis rerum naturalium Universitatis Comenianae, Zoologia 25: 61-81
- Žitňanská O 1988 Notes in spiders (Araneae) of Slovenský Raj. – Acta Facultatis rerum naturalium Universitatis Comenianae, Zoologia 32: 5-16

Erstnachweis von *Evarcha michailovi* in Deutschland (Araneae: Salticidae) sowie weitere für Mecklenburg-Vorpommern neue Spinnenarten

Dieter Martin

doi: 10.5431/aramit4802

Abstract. First record of *Evarcha michailovi* in Germany (Araneae, Salticidae) and further spiders new to Mecklenburg-Western Pomerania. The jumping spider *Evarcha michailovi* Logunov, 1992 was recorded as new to Germany from a nature reserve in the south of Mecklenburg-Western Pomerania in a dry heathland habitat. Furthermore, the first records of the jumping spiders *Evarcha laetabunda* (C. L. Koch, 1846), *Philaeus chrysops* (Poda, 1761) and *Sitticus inexpectus* Logunov & Kronestedt, 1997, the comb-footed spider *Crustulina sticta* (O. P.-Cambridge, 1861) and the crab spider *Heriaeus graminicola* (Doleschall, 1852) in Mecklenburg-Western Pomerania are reported.

Keywords: comb-footed spiders, crab spiders, faunistics, jumping spiders

Zusammenfassung. Die Springspinne *Evarcha michailovi* Logunov, 1992 wird erstmalig für Deutschland von einem ehemaligen Truppenübungsplatz im Süden Mecklenburg-Vorpommerns gemeldet. Gleichzeitig werden Erstnachweise der Springspinnen *Evarcha laetabunda* (C. L. Koch, 1846), *Philaeus chrysops* (Poda, 1761) und *Sitticus inexpectus* Logunov & Kronestedt, 1997, der Haubennetzspinne *Crustulina sticta* (O. P.-Cambridge, 1861) sowie der Krabbenpinne *Heriaeus graminicola* (Doleschall, 1852) erbracht.

Evarcha michailovi Logunov, 1992 – Erstnachweis für Deutschland

Die Checkliste der Spinnen Deutschlands (Blick et al. im Druck) enthält drei etablierte Arten der Gattung *Evarcha* Simon, 1902: *Evarcha falcata* (Clerck, 1757) ist in 524 MTB flächendeckend in Deutschland nachgewiesen (Staudt 2014). Mit 472 belegten MTB ist *Evarcha arcuata* (Clerck, 1757) ebenfalls weit verbreitet, weist jedoch offenbar eine Nachweislücke in Nordwestdeutschland auf. Die mit 68 MTB-Belegen seltenste Art ist *Evarcha laetabunda* (C. L. Koch, 1846), welche in Norddeutschland bislang weitgehend fehlt. Darüber hinaus wurde in Gießen (Hessen) die mit importiertem Obst eingeschleppte mediterrane *Evarcha jucunda* (Lucas, 1846) gefunden (Ludy & Niechoj 2005).

Auf einem ehemaligen Truppenübungsplatz in Mecklenburg-Vorpommern konnte nunmehr der Erstnachweis der bislang für Deutschland nicht verzeichneten *Evarcha michailovi* Logunov, 1992 erbracht werden. Die Art wurde durch Logunov (1992) von *E. laetabunda* getrennt und ist nach Nentwig et al. (2014) leicht von den genannten Arten zu diffe-

renzieren (Abb. 2 - 6). Nach Platnick (2014) wurde *E. michailovi* einerseits aus Russland, Zentralasien und China, andererseits aber auch aus der Türkei und Frankreich gemeldet. Hinzu kommen Nachweise aus Slowenien (Fišer & Kostanjšek 2001) und den Niederlanden (Vogels 2012).

Material: 1 ♂, 18.6.2014, Bodenfalle (Fangzeitraum 4.6.-18.6.2014), 1 ♂, 1 ♀, 3.7.2014, Bodenfalle (Fangzeitraum 18.6.-3.7.2014), 1 ♀, 14.8.2014, Bodenfalle (Fangzeitraum 31.7.-14.8.2014). Ein weiteres ♀ wurde bei einer Nachsuche am 3.7.2014 gemeinsam mit einem ♀ von *Evarcha falcata* mit dem Kescher erbeutet. Alle Funde stammen vom selben Standort. Die Belege befinden sich in der Sammlung des Verfassers.

Fundort: Naturschutzgebiet „Marienfließ“, MTB 2639, 53°21'23" N, 12°11'05" E, 76 m NN

Biotop: Das NSG „Marienfließ“ erstreckt sich auf einem ehemaligen Truppenübungsplatz grenzüberschreitend zwischen Brandenburg (1228 ha) und Mecklenburg-Vorpommern (610 ha). Das Untersuchungsgebiet befindet sich im Anteil von Mecklenburg-Vorpommern in der Nähe von Retzow im weichseleiszeitlichen Sandergebiet (Parchim-Meyenburger Sandflächen). Es handelt sich vorwiegend um xerotherme Sandstandorte auf einem