

***Maro lehtineni* (Araneae: Linyphiidae) – a spider species new to the fauna of Poland**

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Abstract. The rare linyphiid spider species *Maro lehtineni* Saaristo, 1971 was recorded in the Polish part of the Sudetes, in the Giant Mountains (in Polish Karkonosze). Five males were found on one of the sloping transition mires in the spring and early summer of 2011 and 2012. We provide new figures for identification of this species, and summarize and discuss data on its distribution, characteristic habitats and phenology.

Keywords: Giant Mountains, mires, mountains, Sudetes

Zusammenfassung. *Maro lehtineni* (Araneae: Linyphiidae) – eine neue Spinnenart für die Fauna von Polen. Die seltene Linyphiidenart *Maro lehtineni* Saaristo, 1971 konnte im polnischen Teil des Riesengebirges (polnisch Karkonosze) nachgewiesen werden. Fünf Männchen wurden auf einem Hangzwischenmoor gefunden. Wir veröffentlichten neue Abbildungen zur Bestimmung dieser Art und fassen die Daten über Verbreitung, bevorzugten Lebensraum und Phänologie zusammen.

Maro O. P.-Cambridge, 1906 is a genus of very small spiders belonging to Linyphiidae which includes 17 species (World Spider Catalog 2015) living in the Palaearctic and the northern Nearctic. There are six European species (Tanasevitch & Nekhaeva 2014, van Helsdingen 2015); four species have been found so far in central Europe. All *Maro* spiders, apart from being minute, seem to have secluded way of life and are therefore rarely found. However, it was recently shown that at least two of them – *Maro lepidus* Casemir, 1961 and *Maro minutus* O. P.-Cambridge, 1906 – might be quite numerous on mountainous mires (Wiśniewski & Wesołowska 2012).

Our knowledge of the distribution of *Maro* in Poland has increased greatly in the last three decades. Only *M. minutus* is widely distributed (Kupryjanowicz 2008) and has been recently recorded from different localities (Sudetes – Woźny & al. 1988, Masurian Lakeland – Staręga 1996, Polesie – Staręga 2000, Poleski National Park – Stańska et al. 2002, Biebrzański National Park – Kupryjanowicz 2003). *Maro sublestus* Falconer, 1915 was found in the Sudetes, in the Giant Mountains (Karkonosze/Riesengebirge) by Szymkowiak (2004). Wiśniewski & Wesołowska (2012) documented the presence of

M. lepidus in different ranges of the Sudetes (Giant Mountains, Izera Mountains, Table Mountains), but also confirmed and supplemented data on distribution with regards to *M. minutus* and *M. sublestus* (Giant Mountains, Izera Mountains).

The record of another species from this genus – *Maro lehtineni* – is presented here, thus all four species known from central Europe to date are also present in Poland, in the Giant Mountains. Our main aims are to provide new figures, which might be helpful for species identification, and summarize data on the biology of *M. lehtineni*.

Material and methods

The material comes from a study in which the diversity of spider assemblages in mountainous mires in the Sudetes was analysed. Spiders were sampled using pitfall traps and sweep nets in 21 mountainous mires in the Polish part of the Giant Mountains (Karkonosze) and in the Izera Mountains from April to October in 2010 and 2011, and from April to May in 2012. Mountainous raised bogs and poor fens were investigated. The other study that concerned selected habitats surrounding four of these mires was carried out in 2012; however no specimens of *M. lehtineni* were recorded there.

Five males of *M. lehtineni* were found in a single transition mire, on the slopes of the Giant Mountains ($50^{\circ}46.075'N$, $15^{\circ}41.255'E$; 1210m a.s.l.; Figs 1, 2). All *M. lehtineni* were caught using pitfall traps, in the spring and early summer (trap exposure peri-



Figs 1–2: Mire where *Maro lehtineni* was recorded

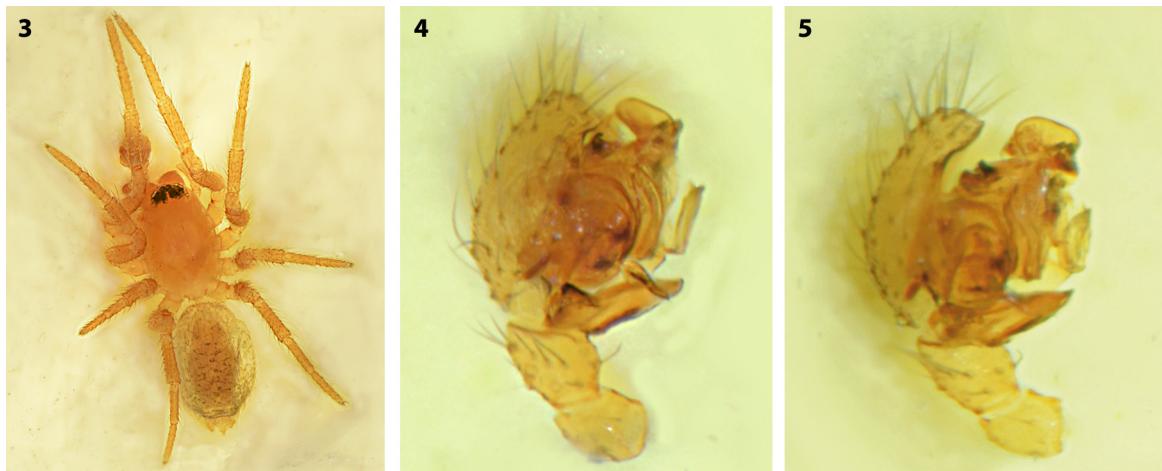
od for these records: 27 April–12 May 2011, 12–30 May 2011, 16 June–3 July 2011, 10–29 May 2012). This species cohabited with *M. lepidus* (21 males, 4 females) and *M. sublestus* (1 male) in the same mire.

Identification of *Maro lehtineni*

The three species already known from Poland (*M. lepidus*, *M. minutus* and *M. sublestus*) are fairly easy to identify based on their lamella characteristica in the male palp and general appearance of the female epigyne (Saaristo 1971). However, recognising *M. lehtineni* requires more care.

Males of *M. lehtineni* (Fig. 3) are distinguished from congeners by the shape of the lamella charac-

teristica, which is not divided (as in *M. minutus*), but pointed with hardly visible denticles (compared to *M. sublestus* which has this part of the bulb larger, truncated and with a conspicuously indented apical margin), thin and not scale-like (distinguishing it from *M. lepidus*). The overall appearance of this structure is thus characteristic, but due to its extremely small size it may be difficult to see the differences immediately. Furthermore, its shape is strongly dependent on the angle, from which the palp is being observed and possibly fairly changeable (Figs 4–8, compare also Saaristo 1971, Thaler 1983, Bolzern et al. 2005). In telling apart the four species, it is also useful to compare the overall proportions of the paracymbium.



Figs 3-5: Male of *Maro lehtineni*; 3. general appearance, 4.-5. palp in lateral view, seen from slightly different angles.

Female genitalia of *M. lehtineni* are similar to those of *M. lepidus*. Unfortunately during the study we did not find any female of the newly recorded species. The figures and descriptions by Saaristo (1971) offer a sufficient basis for distinguishing females of the two species.

Distribution, habitats and phenology

Maro lehtineni has not been recorded in Poland before, but the single specimen of this species was found fairly close to the Polish border, in the Czech part of the Giant Mountains (Růžička 2000). Apart from the Czech Republic it is also known from Austria (Thaler 1983), Belgium (Baert & Kekenbosch 1979), Germany (Blick et al. 2004), Finland (Saaristo 1971), Norway (Hauge 1980), Slovakia (Svatoň & Gajdoš 2004), Sweden (Granström 1978) and Switzerland (Bolzern et al. 2005).

There is little information about typical habitats and time of occurrence of the presented species, because data are very scarce. In this study all specimens were found in a typical, sloping, transition mire in the upper-forest zone of the Giant Mountains (where it ranges app. from 1000 to 1250 m a.s.l.). This habitat seems to be characteristic for *M. lepidus* instead, which is sometimes regarded as typhobiont species (Casimir 1976) and indeed this species was the most numerous *Maro* in this mire. In addition, females – which are less active than males – of *M. lepidus* were recorded there. The presence of *M. lehtineni* might also be connected with its dispersal from the other habitats (in case of this particular

mire surrounding habitats were not analysed) and it is hard to justify here what its real affinity towards mountainous mires is.

Previous records of this species came from the northern Europe, where it has been recorded among moss *Hylocomium* (Saaristo 1971), in *Sphagnum* (Palmgren 1975), both within spruce forests, or in *Calluna* heaths with *Hylocomium* (Hauge 1980). Moreover, the species was found in different habitats in the mountains, such as hay meadows (Thaler 1983), dwarf-shrub heaths (Thaler 1983, Bolzern et al. 2005, Muff et al. 2007), timberline and spruce forest (Muff et al. 2007). It was also found in the other places with suitable habitats, including bogs or fens (Baert & Kekenbosch 1979, Svatoň & Gajdoš 2004, Martin 2009), sedge swamp or swamp forests (Martin 2009). In summary, it was found in the variety of habitats in northern Europe and in the mountains, but also in some places with high humidity in the lowlands of Central Europe.

M. lehtineni was found predominately in early spring, just after the snow melted, however one male was observed later, in early summer. This activity pattern resembles that of *M. lepidus* (see Wiśniewski & Wesołowska 2012). In the other studies the relationship between presence of *M. lehtineni* and the specific microclimate caused by the melting snow in the mountains was also suggested (Bolzern et al. 2005).

The biology of the presented species is poorly known, because it is extremely rare and difficult to observe. Hence, any new data on its distribution are of considerable importance.

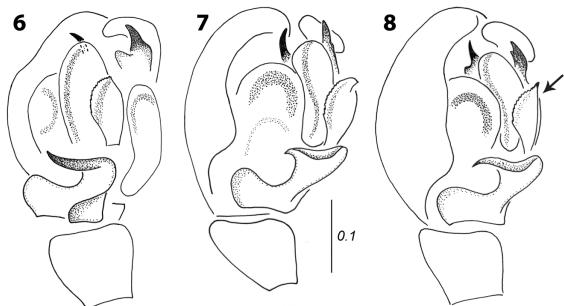


Fig. 6-8: *Maro lehtineni*, lateral view of palpal organs of the two males. **6-7.** first male, **8.** second male. The shape of the lamella characteristica is changeable and depends on the viewing angle. Arrow points to the lamella characteristica.

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