

Uloborus walckenaerius and *Oxyopes heterophthalmus* in Poland (Araneae: Uloboridae, Oxyopidae)

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Abstract. We report the presence of *Uloborus walckenaerius* Latreille, 1806 and *Oxyopes heterophthalmus* (Latreille, 1804) in Poland. Two females and a juvenile of *U. walckenaerius* and a male of *O. heterophthalmus* were recorded in a heathland in the western part of the country, in Lower Silesia. Both species are known from similar habitats in neighbouring regions in eastern Germany (Brandenburg and Saxony). Heathlands in Poland may have great importance in maintaining populations of these two species, and some other rare invertebrates. The habitat requires management activities.

Keywords: Central Europe, faunistics, former military area, heath, prescribed fire

Zusammenfassung. *Uloborus walckenaerius* und *Oxyopes heterophthalmus* in Polen (Araneae: Uloboridae, Oxyopidae). Wir weisen *Uloborus walckenaerius* Latreille, 1806 und *Oxyopes heterophthalmus* (Latreille, 1804) erstmals für Polen nach. Zwei Weibchen und ein Jungtier von *U. walckenaerius* sowie ein Männchen von *O. heterophthalmus* wurden in Heidegebieten Westpolens/Niederschlesiens gefunden. Beide Arten sind bereits aus ähnlichen Lebensräumen im benachbarten Osten Deutschlands (Brandenburg und Sachsen) bekannt. Die *Calluna*-Heiden spielen für den Schutz beider Arten, wie auch für andere seltene Wirbellose, eine wichtige Rolle. Für den Erhalt des Lebensraumes sind Managementmaßnahmen notwendig.

Protection of heathlands in Europe has recently become an important topic. This issue has also been discussed in the context of spider populations (Krause et al. 2011), communities (Bell et al. 2001), or ecology of different arthropod groups, also taking different heathland types into account (Fartmann et al. 2015). Large-area heathlands in western Poland are situated mostly in former, and still actively used, military training areas and are anthropogenic. Nevertheless, these habitats are considered valuable and the need to prevent natural succession has been discussed. In 2015 a plot of heather in Lower Silesia (W Poland) was rejuvenated using prescribed burning and a subsequent inventory of the flora and fauna in the plot, and in some adjacent habitats, was carried out. In the course of this research we observed two spider species that had not been recorded from the territory of Poland before: *Uloborus walckenaerius* Latreille, 1806 from the family Uloboridae and *Oxyopes heterophthalmus* (Latreille, 1804) from Oxyopidae. The aim of this article is to document these records and to discuss them in the context of heathland protection issues.

Only two members of the family Uloboridae have been reported from Poland to date: *Hyptiotes paradoxus* (C. L. Koch, 1834) and *Uloborus plumipes* Lucas, 1846 (Nentwig et al. 2017). The previous species was sporadically recorded in different parts of the country (Kupryjanowicz 2008), the latter is a typical synanthropic spider in the Central Europe and it is regularly observed in greenhouses and plant markets (Stankiewicz & Kupryjanowicz 2002, Rozwałka 2007, Rozwałka et al. 2013). The newly found spider – *Uloborus walckenaerius* – is a Palearctic species (World Spider Catalog 2017). It has been recorded from neighbouring countries – i.e. the Czech Republic, Germany, Slovakia and Ukraine (Nentwig et al. 2017). The only oxyopid species known in Poland to date was *Oxyopes ramosus* (Martini & Goeze, 1778). It is not a rare spider and – besides being spotted in diverse habitats – it is known to be very common in heathlands (Nentwig et al.

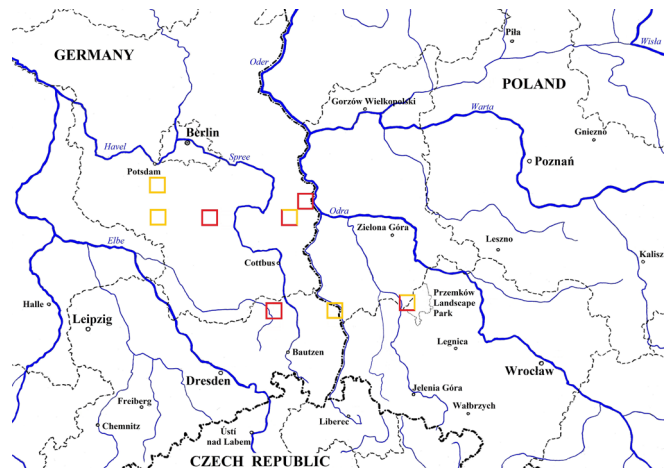


Fig. 1: Sites, where *Uloborus walckenaerius* (red frames) and *Oxyopes heterophthalmus* (yellow frames) were recorded in Brandenburg and Saxony (after the Arachnologische Gesellschaft 2017) and their new locality in Poland (UTM square: WT40). Main rivers and cities, country and voivodeship/Land borders are depicted. The area of the Landscape Park of Przemków is also shown (small dots).

2017). *Oxyopes heterophthalmus* is a decidedly rare species near its northern range border. Its known localities – for example in Germany (Arachnologische Gesellschaft 2017) or in southern England (British Arachnological Society 2017) – are extremely scarce or scattered.

Site and sampling methods

The heathland is situated in the middle part of a former military training area, which was used until the early 1990s (N51°28'04", E15°42'09", 150 m a.s.l.; western Poland, northern part of Lower Silesia Voivodeship; Fig. 1). These habitats are protected within the Przemków Landscape Park and are also the part of the Natura 2000 network ('Wrzoso-wisko Przemkowskie', PLH020015). Many large-area heath patches, which have not undergone succession by Scots pine or birch yet, can still be found there. Prescribed burning was applied to rejuvenate one, ca. 4.5 ha large, old heather plot on 18 March 2015. We carried out a subsequent fauna survey of

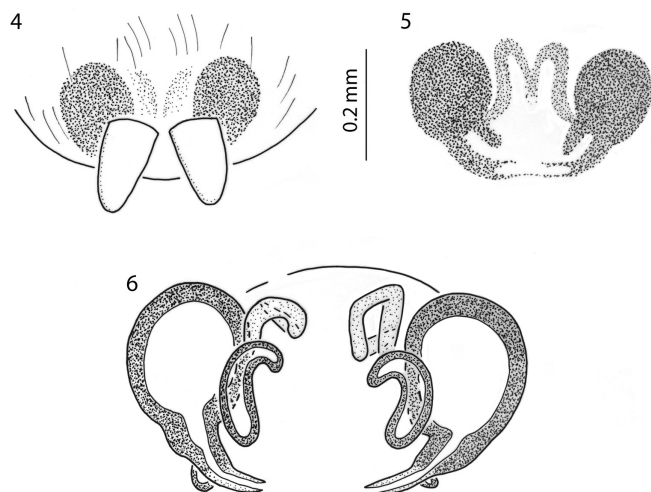


Figs 2-3: *Uloborus walckenaerius*, female habitus. **2.** Dorsal, **3.** Ventral

the area using pitfall traps (seven per plot) in the burned plot, in the neighbouring heather and a stand of the grass *Molinia caerulea* (L.) Moench. The traps were exposed all year round. Additionally, we sampled invertebrates from heather, *Molinia* and pine trees (burned and living) with a sweep net. A beating net was used to take samples from trees; we also sampled invertebrates by beating them from heather and grass onto a metal bowl. Some other neighbouring habitats were also investigated by sweep-netting.

The records

Two females and one juvenile of *Uloborus walckenaerius* were found. The species has a very characteristic habitus (Figs 2-3) and genitalia (Figs 4-6). We collected the specimens either with a sweep-net (on 29 May 2015, 28 May 2016 – females) or by sampling with a metal bowl from heather (on 16 September 2016 – juvenile). The three specimens were found in



Figs 4-6: Epigyne of *Uloborus walckenaerius*. **4.** External view, **5, 6.** Internal structures (ventral view)

places dominated by heather *Calluna vulgaris* (L.) Hull: in one case this was a patch of compact, old *Calluna*-shrubs (Fig. 7); in the other – a dune fairly densely covered with heather; the juvenile was found in small *Calluna* upgrowth (Fig. 8), 18 months after prescribed fire was applied to rejuvenate heather in this plot.

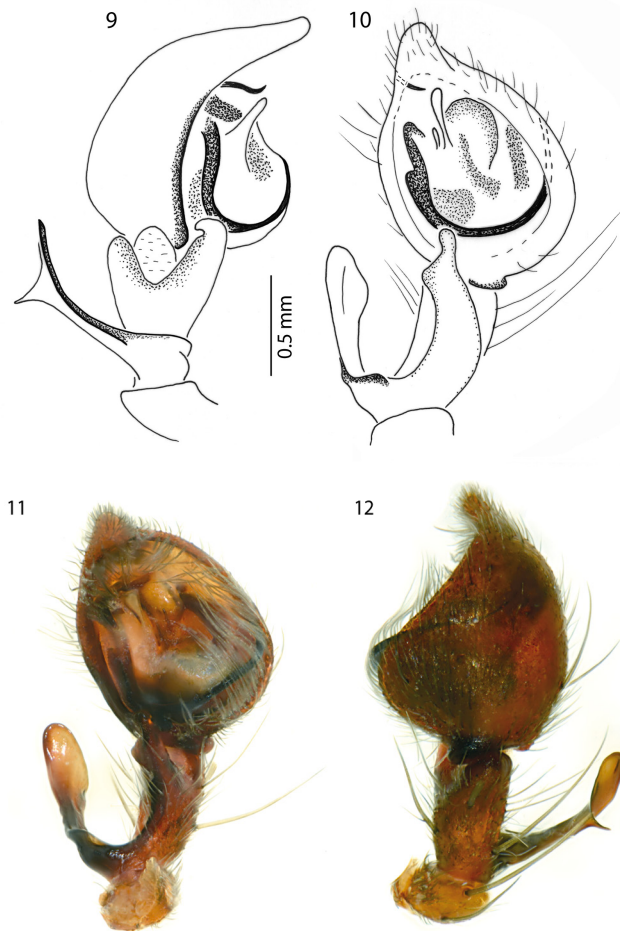
Oxyopes heterophthalmus is easily distinguished from its congeners by the genital structure (Fig. 9-12). The single male of this species was found in a pit-fall trap in the plot where prescribed burning was applied (Fig. 8). The exposure time of the trap was 28 May – 21 June 2016, i.e. about 14 months after the fire.



Figs 7-8: Heathland, habitat of *Uloborus walckenaerius*. **7.** Mature heathland with compact *Calluna*, **8.** Regenerating heathland, 17 months after applying prescribed burning (25 Aug 2016)

Discussion

Both species are known from neighbouring countries and their occurrence in Poland was to be expected. They were recorded in Saxony and Brandenburg (Platen et al. 1999, Balkenhol & Haase 2013, Kielhorn 2016, Arachnologische Gesellschaft 2017) fairly close to the country border. These two regions share similar habitats, there is also a plenty of former and contemporary military training areas where large heathland patches persist. *Uloborus walckenaerius* was also recorded at similar latitudes to the present location, for example in the southern part of England (Locket & Millidge 1951, Denton 1999a, British Arachnological Society 2017), in Belgium and the Netherlands (van Helsdingen 1999). It is rare in Central Europe – in Germany the species was reported from just few places (Arachnologische Gesellschaft 2017); in the Czech Republic it was only found in the southern part of Moravia (Czech Arachnological Society 2017). *Oxyopes heterophthalmus* has similar distribution to that of *U. walckenaerius* in this part of Europe, but it seems to be even rarer, as shown by the example of the British Isles – where it is present in only few



Figs 9-12: *Oxyopes heterophthalmus*, male palp. **9.** Retrolateral view, **10.** Ventral, **11.** Ventral, **12.** Dorsal

places in southern England (British Arachnological Society 2017) – and Germany (Arachnologische Gesellschaft 2017).

The two species have quite clear habitat preferences in the northern part of their range, as they prefer warm and dry habitats. *Uloborus walckenaerius* is generally recognized as a xerothermic and thermophilous species (Platen et al. 1999, Buchar & Růžička 2002). The majority of records from the British Isles (Locket & Millidge 1951, Denton 1999a, British Arachnological Society 2017) and Germany (Platen et al. 1999, Kielhorn 2016, Nentwig et al. 2017) come from heather. In the Czech Republic it was found predominately in different sandy habitats (Růžička 1998, Buchar & Růžička 2002, Hula et al. 2014). In Ukraine it was most numerous in sandy steppes (Polchaninova 2012). It is worth remembering that some of the habitats where *U. walckenaerius* was found have been created by human activity (Weber 1999, Hula et al. 2014); the majority of heathlands in Poland are also anthropogenic. *Oxyopes heterophthalmus* was also recorded in heathlands both in England (Denton 1999b, British Arachnological Society 2017) and in Germany (von Broen 1995, Balkenhol & Haase 2013, Kielhorn 2016), which confirms its affinity to these habitats in this part of Europe.

Due to their rarity and preference for particular habitats the two species have been included into several Red Lists. *Uloborus walckenaerius* has high ranks in some European countries (EN in the Czech Republic – Řezáč et al. 2015; seriously endangered in Germany – Blick et al. 2016) or re-

gions, e.g. Brandenburg (endangered from extinction; Platen et al. 1999). However in comparison to previous versions of these lists, it has been given lower categories, because of an increase in its abundance (Řezáč et al. 2015), better availability of information on its distribution or changes in the methodology of preparing such lists (Blick et al. 2016). *Oxyopes heterophthalmus* was also included in some lists as extremely rare (Blick et al. 2016) or endangered from extinction (Platen et al. 1999).

The presence of the two species in this part of Poland is important with respect to nature protection. In the neighbouring countries the species are rare, endangered and regarded as valuable. They might be considered as characteristic for heathlands. These habitats require management activities as they quickly undergo succession by pine and birch forest, and there is also the need for rejuvenation of heather. The other concern is the expansion of *Molinia caerulea* grasslands – a problem on the European scale (Chambers et al. 1999, Brys et al. 2005). In the heathlands of Przemków pine and birch overgrowth is regularly cut down. Lately, prescribed fire and choppering were experimentally applied to rejuvenate the heath (the part of our study). In other studies these methods were found to be appropriate to protect habitats of another endangered species – also present in our study – *Eresus kollari* Rossi, 1846 (Krause et al. 2011). Burning the heather may create suitable habitats for a high number of valuable spider species (Krause & Assmann 2016). Another example of a rare species present in the area is a salticid protected under Polish law – *Philaeus chrysops* (Poda, 1761), which lives both in the former and the presently used military training areas (Wiśniewski et al. 2015).

Former and actively used military training areas thus often serve as refugia for disturbance dependent species (Warren & Büttner 2008) and valuable invertebrate assemblages (Čížek et al. 2013), including spiders (Buchholz & Hartmann 2008, Lemke 2017). The protection of anthropogenic habitats present in these areas may raise some ambiguities in terms of its scope and methods. However, the results may be important not only for biological diversity but also to local human communities, as the example of heather honey production in Poland shows. The presence of *U. walckenaerius*, *O. heterophthalmus*, the above mentioned *P. chrysops*, and many other rare species are important reasons to undertake management activities of heathlands in this region.

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