



A new locality of the European yellow sac spider *Cheiracanthium punctorium* (Villers, 1789) (Araneae: Cheiracanthiidae) in eastern Poland

Kamil STANIAK¹, Grzegorz K. WAGNER^{2*} and Bernard STANIEC²

¹Biological Science Students Club in Maria Curie-Skłodowska University, Lublin, Poland;
<https://orcid.org/0000000264404704>

²Department of Zoology and Environmental Conservation, Institute of Biological Sciences, Maria Curie-Skłodowska University, Lublin, Poland

*corresponding author: grzegorz.wagner@umcs.pl; <http://orcid.org/0000-0002-8532-4455>

Abstract: This is the first record of the European yellow sac spider *Cheiracanthium punctorium* (Villers, 1789) from the Lublin Upland (SE Poland). A dozen or so silk nests containing these spiders were found among goldenrod stems (*Solidago* sp.) on a dry meadow near Chodel, a village in the valley of the River Chodelka on 8 October 2021.

Key words: expansion, xerothermophilous species, Chodel, Lublin Upland

INTRODUCTION

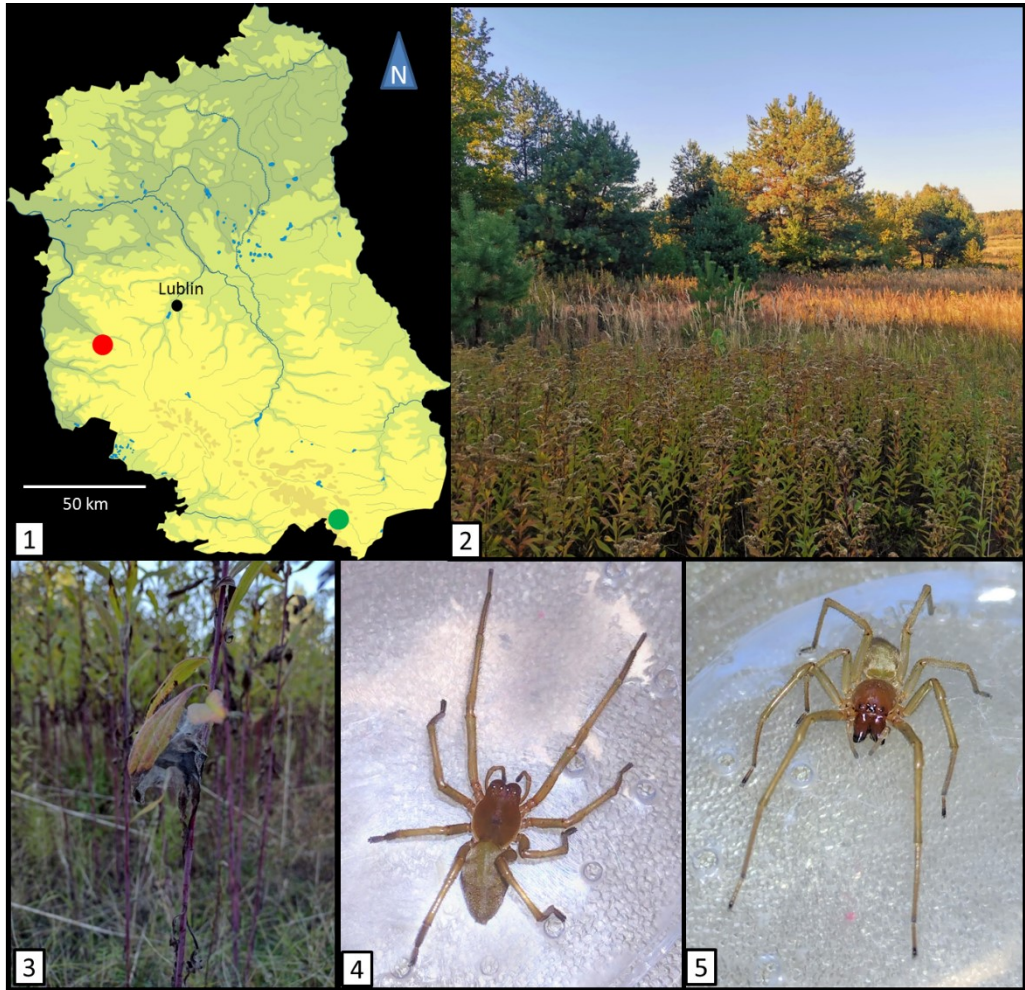
Cheiracanthium (Koch, 1839) is the only genus from the family Cheiracanthiidae (Wagner, 1887), before known as Eutichuridae (Lehtinen, 1967), in Europe (Ramirez et al. 1997). According to the World Spider Catalog (2022), it contains 214 species worldwide, 35 of which have to date been recorded in Europe (Morano & Bonal 2016, Nentwig et al. 2022).

The spiders in this genus are active predators, their activities peaking in the evening and at night. By day, they conceal themselves in characteristic silk nests, which they attach to the upper parts of plant stems (Fig. 3) – hence their English name of sac spiders. They inhabit various types of meadows and cultivated fields, lying in wait for their victims on herbaceous and shrubby plants. The dense tufts of bristles on the ends of their legs enable them to move about on sloping surfaces with ease. Their bodies are usually yellow to greenish, with some species having a little orange or brown (Figs 4–5) (Morano & Bonal 2016, Belik & Rozwałka 2007).

Cheiracanthium punctorium (Villers, 1789), the European yellow sac spider (henceforth “yellow sac spider”), inhabits strongly insolated localities with a varied plant cover, such as xerothermic swards, woodland margins, meadows or overgrowing fallow land. The species’ original distribution in Europe used to be limited to the southern regions of the continent, with just a few warm localities in central Europe, where the Upper Rhine Plain formed its northernmost range boundary (Krehenwinkel et al. 2016, Varl et al. 2017). But since the mid-20th century it has been spreading northwards, reaching as far as Sweden. At first, the newly colonized areas were disjunct islands quite far apart from one another. In Poland before 2007, only a few isolated localities of this species were known from the south of the country – Krzemionki Opatowskie, the Ślęża Massif, Wrocław, Kraków and the Sandomierz Basin. At that time, this spider was classified as being seriously endangered (EN) in Poland (Staręga et al. 2002). It should be borne in mind, however, that older literature data referring to members of the sac spider genus in Poland appear to be somewhat ambiguous, because the synonym *Cheiracanthium nutrix* (Walckenaer, 1802) was used not only for the yellow sac spider *Ch. punctorium*, but also for other species, very common in Poland, such as *Ch. virescens*

(Sundevall, 1833), *Ch. oncognathum* (Thorell, 1871) and *Ch. erraticum* (Walckenaer, 1802) (Krehenwinkel et al. 2016, Belik & Rozwałka 2007).

Despite the plethora of information cropping up in popular internet services about a “dangerous yellow sac spider” in Poland, very few data relating to the current distribution of *Ch. punctorium* in Poland have been published in the scientific literature. Fifteen years ago, Belik & Rozwałka (2007) recorded a new locality of *Ch. punctorium* (23 individuals) at Boruszewice in Upper Silesia, while just last year Rozwałka & Stachowicz (2021) discovered a large metapopulation of this spider in the eastern Roztocze region.



Figs 1–5. *Cheiracanthium punctorium* and its sites in the Lublin voivodeship. 1 – Distribution of known localities of *Ch. punctorium* in the Lublin voivodeship; ● – location known from literature, ● – new location near Chodel; 2 – Habitat of *Ch. punctorium* at the locality near Chodel (photo by G. K. Wagner); 3 – Silk nests on plant stems in the newly discovered site; 4–5 – the specimens of *Ch. punctorium* from the location near Chodel. Photos 3–5 by K. Staniak.

RESULTS

On 8 October 2021, *Cheiracanthium punctorium* was recorded for the first time in the Lublin Upland (according to Kondracki 2009), in the Chodel Basin, near the village of Chodel – specifically in the Chodel Protected Landscape Area (GPS: N 51.115647°, E 22.109987°) (Figs 1–2). A dozen or so silk nests containing spiders were found (Fig. 3). These were initially identified as members of the genus *Cheiracanthium* (Koch, 1839). Subsequent taxonomic analysis of the arthropods inside three such nests confirmed that they belonged to the species *Ch. punctorium* (Figs 4–5).

This population of the yellow sac spider was residing in well insolated fallow land on a sandy hill with a westerly exposure (River Chodelka valley, Chodel Protected Landscape Area). The dominant plant here was goldenrod (*Solidago* sp.), dense clumps of which were growing among scattered young pine trees. To the north and south, this fallow land was bordered by slightly closer canopied pine copses. The spiders' silk nests, spun roughly half way up the goldenrod stems, consisted of plant fragments held together by the silk threads. There was never more than one silk nest per plant. Some of the nests contained females staying with their freshly hatched offspring.

DISCUSSION

Given the habitat preferences of this spider, it is highly likely that there will be many more of its subpopulations in the Chodelka valley. This area abounds in sandy swards, with sparse woody vegetation, which gradually change into calcareous xerothermic swards towards the mouth of the Chodelka on the River Vistula; the most interesting of these swards are near Podgórz, Męcierz and Kazimierz Dolny. The thermophilous flora and fauna growing in this area testify to its characteristic features, which offer the yellow sac spider a favourable habitat. This is substantiated by numerous reports of other xerothermophilous arthropod species (e.g. Borański et al. 2019, Buszko 1997, Byk et al. 2020, Kucharczyk 1997).

Ch. punctorium is clearly in the process of spreading across Poland. It used to be quite rare, being found only along the country's southern borders, but now it is moving northwards and becoming ever more common, especially in south-western and central Poland. Climate change and the great abundance of potentially suitable grassland habitats are factors favouring the creation of new, stable populations of this spider. Its considerable aerial dispersal capabilities will facilitate its encroachment into hitherto unoccupied areas (Morano & Bonal 2016, Rozwałka & Stachowicz 2021). Moreover, the fact that *Cheiracanthium* spiders are highly efficient predators, will also contribute significantly to the enlargement of their distribution (Hogg et al. 2010).

ACKNOWLEDGEMENTS

We would like to heartily thank Dr Robert Rozwałka for his taxonomic identification of the specimen of *Cheiracanthium punctorium*.

REFERENCES

- BELIK K. & ROZWAŁKA R. 2007. New data of *Cheiracanthium punctorium* (Villers, 1789) (Araneae: Miturgidae) and notes of distribution of this species in Poland. *Przegląd zoologiczny* 51: 157–161. [In Polish with English summary].
- BORAŃSKI M., CELARY W. & TEPER D. 2019. Wild bees of the proposed nature reserve “Skarpa Wiślana” in Męcierz (Kazimierski Landscape Park). Part 1 – long-tongued bees Megachilidae and Apidae. *Acta Zoologica Cracoviensia*, 62: 21–39. DOI: 10.3409/azc.62.02
- BUSZKO J. 1997. A distribution atlas of butterflies in Poland (Lepidoptera: Papilionoidea, Hesperioidea) 1986–1995. Oficyna wydawnicza Turpress, Toruń, 170 pp.

- BYK A., CIEŚLAK R. & PISKOREK W. 2020. Persistent isolated population of *Onthophagus grossepunctatus* Reitter, 1905 (Coleoptera: Scarabaeidae) near Kazimierz Dolny (Poland). *Baltic Journal of Coleopterology* 20: 101–108.
- HOGG B. N., GILLESPIE R. G. & DAANE K. M. 2010. Regional patterns in the invasion success of *Cheiracanthium* spiders (Miturgidae) in vineyard ecosystems. *Biological Invasions* 12: 2499–2508. DOI: 10.1007/s10530-009-9659-1
- KONDRACKI J. 2009. *Geografia regionalna Polski*. PWN, Warszawa, 444 pp.
- KREHENWINKEL H., RÖDDER D., NÄPÄRUS-ALJANČIĆ M. & KUNTNER M. 2016. Rapid genetic and ecological differentiation during the northern range expansion of the venomous yellow sac spider *Cheiracanthium punctorium* in Europe. *Evolutionary Applications* 9: 1229–1240. DOI: 10.1111/eva.12392.
- KUCHARCZYK H. 1997. Zmiany w strukturze zgrupowań Thysanoptera (Insecta) wybranych zespołów kserotermicznych okolic Kazimierza Dolnego w latach 1959–1988. [Changes in the structure of Thysanoptera (Insecta) communities in some of xerothermic plant associations in the vicinity of Kazimierz Dolny in 1959–1988]. In: PUSZKAR T. & PUSZKAR L. (eds), *Współczesne kierunki ekologii: ekologia behawioralna*. Materiały z sympozjum, Lublin 25–26 listopada 1995 roku [Contemporary trends in ecology: behavioral ecology. Material from Symposium, Lublin 25–26 November], pp. 185–191. Wydawnictwo UMCS, Lublin, 418 pp.
- MORANO E. & BONAL R. 2016. *Cheiracanthium ilicis* sp. n. (Araneae, Eutichuridae), a novel spider species associated with Holm Oaks (*Quercus ilex*). *Zookeys* 2016: 21–39. DOI: 10.3897/zookeys.601.8241
- NENTWIG W., BLICK T., BOSMANS R., GLOOR D., HÄNGGI A. & KROPF C. 2022. Spiders of Europe. Version 4.2022. Available at <https://www.araneae.nmbe.ch> (Apr 2022). DOI: 10.24436/1
- RAMÍREZ M. J., BONALDO A. B. & BRESCOVIT A. D. 1997. Revisión del género *Macerio* y comentarios sobre la ubicación de *Cheiracanthium*, *Tecution* y *Helebiona* (Araneae, Miturgidae, Eutichurinae). *Iheringia Série Zoológica* 82: 43–66.
- ROZWAŁKA R. & STACHOWICZ J. 2021. *Catalog of spiders (Araneae) of the Lublin province*. UKSW Scientist Publishing House, Warszawa, 271 pp.
- STARĘGA W., BŁASZAK CZ. & RAFALSKI J. 2002. *Arachnida*. In: Głowaciński Z. (ed.), *Red list of endangered animals in Poland*, pp. 133–140. IOP PAN, Kraków, 155 pp.
- VARL T., GRENC D., KOSTANIŠEK R. & BRVAR M. 2017. Yellow sac spider (*Cheiracanthium punctorium*) bites in Slovenia: case series and review. *Wiener klinische Wochenschrift* 129: 630–633. DOI: 10.1007/s00508-017-1217-8
- WORLD SPIDER CATALOG 2022. *World Spider Catalog*. Version 23.0. Natural History Museum Bern. Available at <http://wsc.nmbe.ch> (05.2022). DOI: 10.24436/2

STRESZCZENIE

[Nowa lokalizacja pająka kolczaka zbrojnego *Cheiracanthium punctorium* (Villers, 1789) (Araneae: Cheiracanthiidae) we wschodniej Polsce]

Cheiracanthium jest jedynym rodzajem reprezentującym rodzinę Cheiracanthiidae w Europie. Zalicza się do niego aktywnie polujące, ciepłolubne gatunki pająków, zasiedlające suche łąki, nieużytki oraz pola uprawne. Pająki te budują na roślinach charakterystyczne oprzędy, w których spędzają dnie, zaś na żer wychodzą w godzinach wieczornych i nocnych. Gatunek *Cheiracanthium punctorium* przez wiele lat ograniczał w Polsce swój zasięg występowania do regionów południowo-zachodnich. Uznawany był za gatunek silnie zagrożony wyginięciem. W dniu 8 października 2021 roku, na piaszczystym i suchym nieużytku w dolinie rzeki Chodelki, stwierdzono na pędach nawłoci obecność kilkunastu oprzędów gatunku *Ch. punctorium*. Jest to pierwsze stwierdzenie tego gatunku na Wyżynie Lubelskiej. Ekspansja gatunku na północny wschód wskazuje na zmiany klimatyczne, sprzyjające rozszerzaniu zasięgów występowania przez gatunki ciepłolubne, takie jak stwierdzony *Ch. punctorium*.

Accepted: 20 May 2022