

An unexpected occurrence: discovery of the genus *Cybaeopsis* Strand, 1907 in Europe with the description of a new species from Italy (Arachnida, Araneae, Amaurobiidae)

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Abstract

We report on the unexpected finding of a new species of the genus *Cybaeopsis* Strand, 1907, *C. lodovicii* **sp. nov.** from the Northern Apennine Mountains in Italy. This is the first documented record of a *Cybaeopsis* species in Europe. Other currently known species of this genus have been previously recorded in North America, the Russian Far-East and Japan. The new species is illustrated and described based on both sexes. Another species from Portugal, *Cybaeopsis theoblicki* (Bosmans, 2021) **comb. nov.**, recently described in the genus *Callobius* Chamberlin, 1947, is hereby transferred to *Cybaeopsis* on the basis of morphological characters. An updated key to the European genera of Amaurobiidae is provided.

Key Words

disjunct distribution, endemism, new combination, new record, taxonomy

Introduction

Cybaeopsis Strand, 1907 is a small genus of cribellate spiders belonging to the family Amaurobiidae Thorell, 1870 currently numbering 10 species (WSC 2022). The majority of the known *Cybaeopsis* species (9 species) are endemic to North America (Leech 1972; WSC 2022). Among them, *Cybaeopsis euopla* (Bishop & Crosby, 1935) is the most broadly distributed species covering a wide area ranging from the territories of the Pacific Northwest and British Columbia on the Pacific coast to Quebec, Main and Nova Scotland in the east of the continent. *Cybaeopsis macaria* (Chamberlin, 1947), *C. wabritaska* (Leech, 1972), and *C. spenceri* (Leech, 1972) share a distribution covering the northwestern area of North America, from Alaska to the Pacific Northwest in the case of the former two species or limited to western Washington for the third one. *Cybaeopsis armipotens*

(Bishop & Crosby, 1926), *C. hoplites* (Bishop & Crosby, 1926), *C. hoplomacha* (Bishop & Crosby, 1926), and *C. pantopla* (Bishop & Crosby, 1935) are distributed in the southeastern region of the United States, in some areas of North Carolina and along the Appalachian Mountains. The last known American species, *C. tibialis* (Emerton, 1888), is distributed over the northeastern part of North America, from New England to the easternmost part of Canada (Leech 1972). The only *Cybaeopsis* currently recorded outside the Nearctic realm is the type species of the genus *C. typicus* Strand, 1907. This species occurs in northeastern Asia, namely in the Sakhalin and the Kurile islands in the Russian Far-East (Marusik et al. 2012) and in the islands of Hokkaido and Eastern Honshu in Japan (Yaginuma 1987; Shinkai et al. 2022; WSC 2022). So far, no records of *Cybaeopsis* have been reported in other regions of the Palaearctic or in other zoogeographical realms. Little is also known about

the ecology of the members of this genus. Apparently, these spiders live in humid and cool microhabitats in shadowed deciduous forests where they build cribellate lace-webs in the leaf litter or under stones and logs (Leech 1972; Paquin and Dupérré 2003).

While studying spider material collected with pitfall traps in beech forests in Northern Apennines, Italy, we found specimens of an unknown amaurobiid species. Surprisingly, a detailed morphological examination of the samples revealed them as belonging to an undocumented species of the genus *Cybaeopsis*. This finding represents the first record of *Cybaeopsis* in Italy and in the whole Western Palaearctic, far outside the supposed natural range of this genus. In addition, while checking information on *Cybaeopsis*, we realized that another closely related species, *Callobius theoblicki* Bosmans, 2021, has been recently found in Portugal but described as belonging to another genus (Bosmans 2021). The aim of this study is to revise and survey the taxonomy and geographic distribution of the genus *Cybaeopsis* in Europe, to describe the new species from Italy and to propose the transfer of *Callobius theoblicki* to *Cybaeopsis*.

Materials and methods

Spider samples were collected during surveys organized by the Museo Civico di Scienze Naturali “E. Caffi” of Bergamo (MSN BG) in the Northern Apennines. Specimens were sampled using pitfall traps with a preservative solution of vinegar and formalin, and preserved in 75% ethanol in the collections of the same institute. Specimens were examined using an Optika SZM stereomicroscope in the laboratories of the MSN BG. Photographs and measurements were taken at the Systematic Zoology Laboratory, Tokyo Metropolitan University, Japan (TMU) using a Canon EOS kiss X8i digital camera mounted on a Nikon SMZ 1270 stereomicroscope. Photographs were merged using Helicon Focus v.7

image stacking software (<https://www.heliconsoft.com>) and edited using Adobe Photoshop CC v.20.0.6 (<https://www.photoshop.com/>). The left male palp is illustrated. Additional photos were taken using a Jeol JSM-6510LV Scanning Electron Microscope (SEM) at TMU. Female genitalia were dissected using a sharp needle and cleared with a 20% solution of KOH before being observed and illustrated with a Nikon Optiphot 2 microscope. All measurements are reported in millimeters. Legs' measurements are reported as follows: total length (femur, patella, tibia, metatarsus, tarsus). Terminology follows Marusik et al. (2012).

The following abbreviations are included in text and figures: **ALE** = anterior lateral eyes; **AME** = anterior median eyes; **PLA** = posterior lateral eyes; **PMA** = posterior median eyes; **Cd** = copulatory ducts; **Cn** = conductor; **Co** = copulatory openings; **Da1–4** = dorsal apophyses of tibia; **Em** = embolus; **Ip** = internal pockets of the lateral lobes; **LI** = lateral lobes; **Ma** = median apophysis; **Pto** = prolateral tegular outgrowth; **RTA** = retrolateral tibial apophysis; **Rto** = retrolateral tegular outgrowth; **Sp** = spermathecae; **St** = subtegulum; **Te** = tegulum; **Ti** = tibia; **Va** = ventral tibial apophysis.

The samples used in this study are preserved in the following collections: **AMNH** = American Museum of Natural History, New York, USA (Curator: Lorenzo Prendini); **MSN BG** = Museo Civico di Scienze Naturali “E. Caffi” of Bergamo, Italy (Curator: Paolo Pantini).

Comparative material examined

Cybaeopsis typicus Strand, 1907 (Fig. 4A–F): **RUSSIA**: 1♂, 1♀, Russian Far-East, Kunashir Island, Y.M. Marusik leg.

Cybaeopsis euopla (Bishop & Crosby, 1935) (Fig. 5A–F): **U.S.A.**: 1♂, 1♀, **Ontario**: Island 1024, Lake Temagami, 83°3'W, 46°59'N, 15–25 Aug. 1946, W.J. Gertsch, W. Ivie, T.B. Kurata leg. (AMNH);

Results

Key to the genera of Amaurobiidae in Europe (adapted from Nentwig et al. 2022)

- 1 Cribellum absent, promargin of chelicerae with a brush of setae, serrated keel on the inner margin of the cheliceral groove, prolateral position of the median apophysis, embolus complex bent 3 times, solid epigynal plate with copulatory openings located in the epigastral fold, found in the Russian Caucasus *Ovtchinnikovia* Marusik, Kovblyuk & Ponomarev, 2010 (1 sp.)
- Cribellum present, other characters different 2
- 2 (1) Anterior median eyes equidistant from each other and from anterior lateral eyes, opisthosoma with dark median band, male palpal tibia lacking any dorsal apophysis, epigyne with triangular median plate with a strongly sclerotized median part, found in Northern Scandinavia and Siberia *Arctobius* Lehtinen, 1967 (1 sp.)
- Anterior median eyes closer to each other than to lateral eyes, median band on opisthosoma absent or visible only in the anterior half, male palpal tibia with distinct dorsal apophysis, epigyne bilobate, or with weakly sclerotized median plate ... 3
- 3 (2) Dorsal tibial apophysis usually massive and short, always not elongated and not overlying cymbium, epigyne with median plate not clearly separated into two parts *Amaurobius* C. L. Koch, 1837 (38 spp.)
- Dorsal tibial apophysis elongated and partly overlying cymbium, epigyne bilobate 4

- 4 (3) Retrolateral tibial apophysis ending bifurcated, dorsal tibial apophysis with several sharp branches (Da1–4), at least two branches (Da1–2) long and sharp, epigyne extended laterally and lacking a median lobe. Small size (< 6.5 mm)..... *Cybaeopsis* Strand, 1907 (2 spp.)
- Retrolateral tibial apophysis ending unbranched, dorsal tibial apophysis with less branches (usually 2), only one of them long and sharp, epigyne extended antero-posteriorly and with median lobe. Medium to large size (> 8 mm)..... *Callobius* Chamberlin, 1947 (2 spp.)

Taxonomy

Family Amaurobiidae Thorell, 1870

Genus *Cybaeopsis* Strand, 1907

Type species. *Cybaeopsis typicus* Strand, 1907 from the south part of the Russian Far-East and northern Japan.

Diagnosis. Genus closely related to *Callobius* but its members are smaller in size (2.5–6.5 mm vs. 8–12 mm). Males of *Cybaeopsis* can be easily distinguished from males of *Callobius* by the bifurcated retrolateral tibial apophysis (RTA) (vs. unbranched) and by the presence of 2–4 dorsal apophyses (Da1–4), at least 2 of them long and sharp (vs. 2–3 Da of which only one is long and sharp) (Figs 1A, B, E; 4A, D cf. Leech 1972: figs 33, 34 for the type species *Callobius bennetti* (Blackwall, 1846)). Females of *Cybaeopsis* can be distinguished from females of *Callobius* by the epigyne lacking a median lobe (vs. present) and by the shape of its lateral lobes (Ll), rectangular and extended laterally, with flat posterior margins (vs. lateral lobes extended antero-posteriorly with sharp or rounded posterior margin) (Fig. 4E cf. Leech 1972: figs 225). See also Leech (1972) (sub *Callioplus* Bishop & Crosby, 1935) for a detailed diagnosis of the genus.

Description. Total length 2.5–5 (male), 3–6.5 (female). Carapace brown, dark brown or orange-yellowish with darker dorsal radiating striae, fovea clearly visible. Chelicerae frontally swollen. Eight eyes arranged into 2 rows of 4, AME the smallest. Legs uniformly brownish or brown-yellowish, darkened distally. Tarsi with 3 claws, scopula and claws tufts absent. Leg formula: IV, I, II, III. Opisthosoma brown-greyish or dark grey usually with lighter chevrons marks on the dorsal side, unmarked in some specimens. Cribellum undivided. Male palp with retrolateral tibial apophysis (RTA) distally bifurcated, dorsal tibial apophysis divided into several branches of different length (Da1–4), at least two branches (Da1–2) long and sharp. Median apophysis (Ma) sturdy. Prolateral and retrolateral tegular outgrowth (Pto and Rto) more or less developed and protruding from tegulum. Conductor (Co) wide. Embolus (Em) short and sturdy, ribbon-like. Epigyne divided into 2 lobes by a central septum, extended laterally, median lobe absent.

Composition. *Cybaeopsis armipotens* (Bishop & Crosby, 1926); *C. euopla* (Bishop & Crosby, 1935); *C. hoplites* (Bishop & Crosby, 1926); *C. hoplomacha* (Bishop & Crosby, 1926); *C. lodovicii* sp. nov.; *C. macaria* (Chamberlin, 1947); *C. pantopla* (Bishop & Crosby, 1935); *C. spenceri* (Leech, 1972); *C. theoblicki*

(Bosmans, 2021) comb. nov.; *C. tibialis* (Emerton, 1888); *C. typicus* Strand, 1907; *C. wabritaska* (Leech, 1972)

Distribution. North America, Russian Far-East (Sakhalin and Kurile Is.), Japan (Hokkaido Is., Eastern Honshu Is.), Southern Europe (Italy, Portugal).

Cybaeopsis lodovicii sp. nov.

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Figs 1A–H, 2A–F, 3A–D, 5G

Type material. *Holotype* ♂ **ITALY: Liguria:** Genova, Mezzanago, Giaietto, 850 m, (44°25'03"N, 9°28'08"E), beechwood, pitfall trap, 31 Oct. 2009–25 May 2010, O. Lodovici, P. Pantini & M. Valle leg.

Paratypes: **ITALY: Liguria:** 1♂, 4♀♀, same data as the holotype; 2♀♀, same locality, 25 May–18 Aug. 2010 • 1♀, Foresta Demaniale Monte Zatta, ex colonia Devoto, 1050 m, beechwood, pitfall traps 31 Oct 2009–25 May 2010 • 2♀♀, same locality, 25 May–18 Aug. 2010, all O. Lodovici, P. Pantini & M. Valle leg.

Etymology. The specific epithet is a patronym in honor of our colleague and friend Omar Lodovici (Museo Civico di Scienze Naturali di Bergamo, Italy).

Diagnosis. Male of the new species can be distinguished from male of *C. theoblicki* and *C. typicus* by the different shape and number of the dorsal apophyses of the palpal tibia (Da): four Da with Da2 and Da3 long and Da2 ending wider in *C. lodovicii* sp. nov. (vs. only three Da in *C. theoblicki* and Da2 shorter with a sharp end and Da3 very short in both *C. theoblicki* and *C. typicus*). In addition, *C. lodovicii* sp. nov. can be distinguished by the absence of strongly protruding prolateral and retrolateral tegular outgrowths (Pto and Rto) (vs. strongly protruding Pto in *C. typicus* or Rto in *C. theoblicki*) (Figs 1A–D, 3A, B cf. Fig. 4A–D and Bosmans 2021: figs 35, 36). Female of *C. lodovicii* sp. nov. can be distinguished from female of *C. theoblicki* and *C. typicus* by the different shape of the internal pockets (Ip) and lateral lobes (Ll): rectangular Ll with comma-like and laterally elongated Ip (vs. shorter, more squared Ll with shorter and stockier Ip in *C. theoblicki* or more rounded Ll and Ip in *C. typicus*) (Figs 2A, B, D, 3C cf. Bosmans 2021: figs 34–41).

The different number and shape of Da and Ll quickly distinguish male and female *C. lodovicii* sp. nov. from the American congeners (for comparison see Leech 1972: figs 85–101).

Description. (the specimens are in rather poor condition and the coloration may be different in freshly collected samples). **Male (holotype).** Habitus as in Fig. 2E. Total

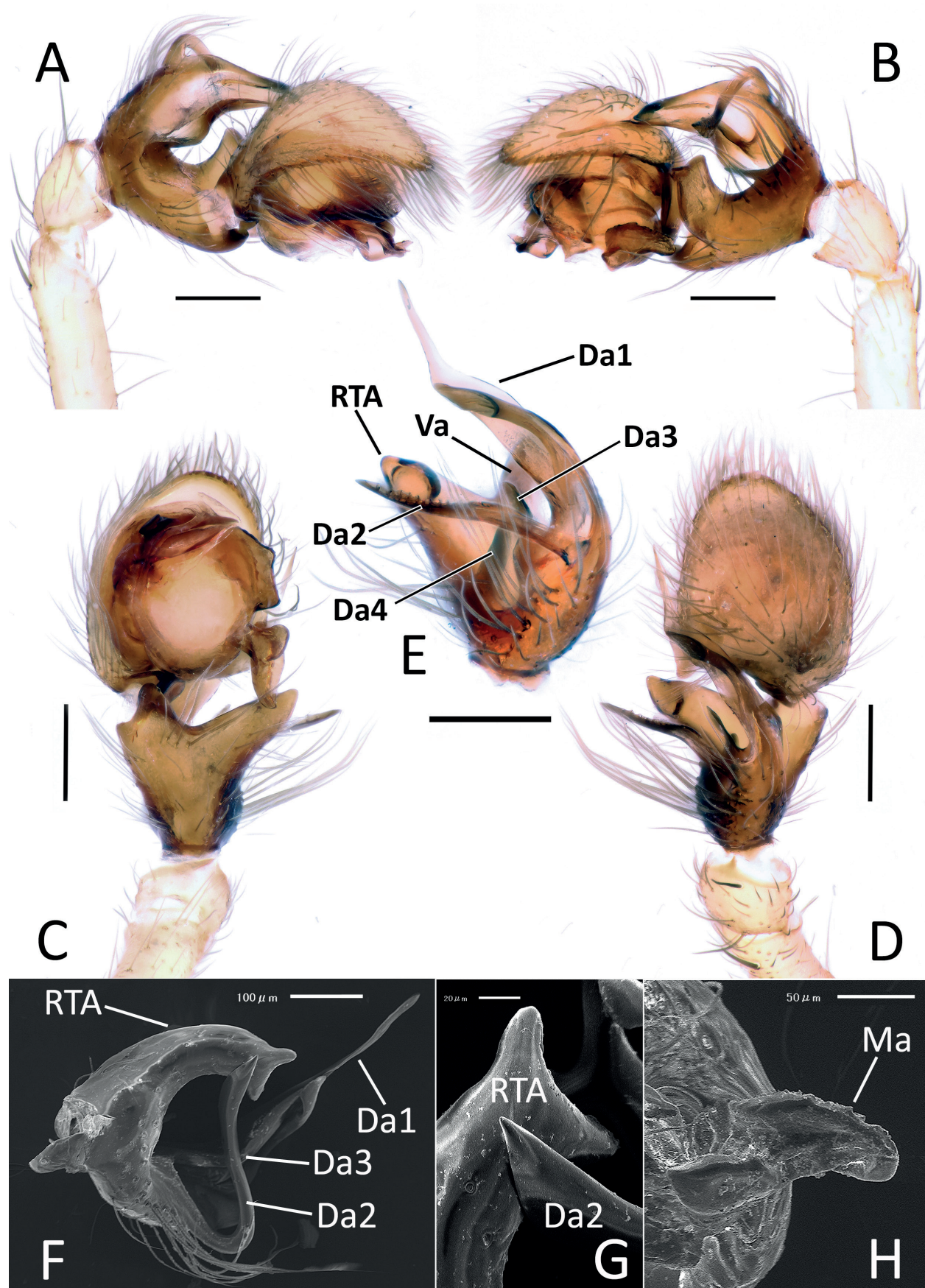


Figure 1. *Cybaeopsis lodovicii* sp. nov. male palp. **A** prolateral view; **B** retrolateral view; **C** ventral view; **D** dorsal view; **E** tibial, dorsal view; **F** SEM image of the tibial apophyses, dorsal view; **G** SEM image of detail of the RTA tip; **H** SEM image of detail of the median apophysis, ventral view. Abbreviations: Da 1–3 = dorsal apophyses; RTA = retrolateral tibial apophysis; Va = ventral apophysis. Scale bars: 0.2 mm (**A–D**); 0.1 mm (**F**); 0.02 mm (**G**); 0.05 mm (**H**).

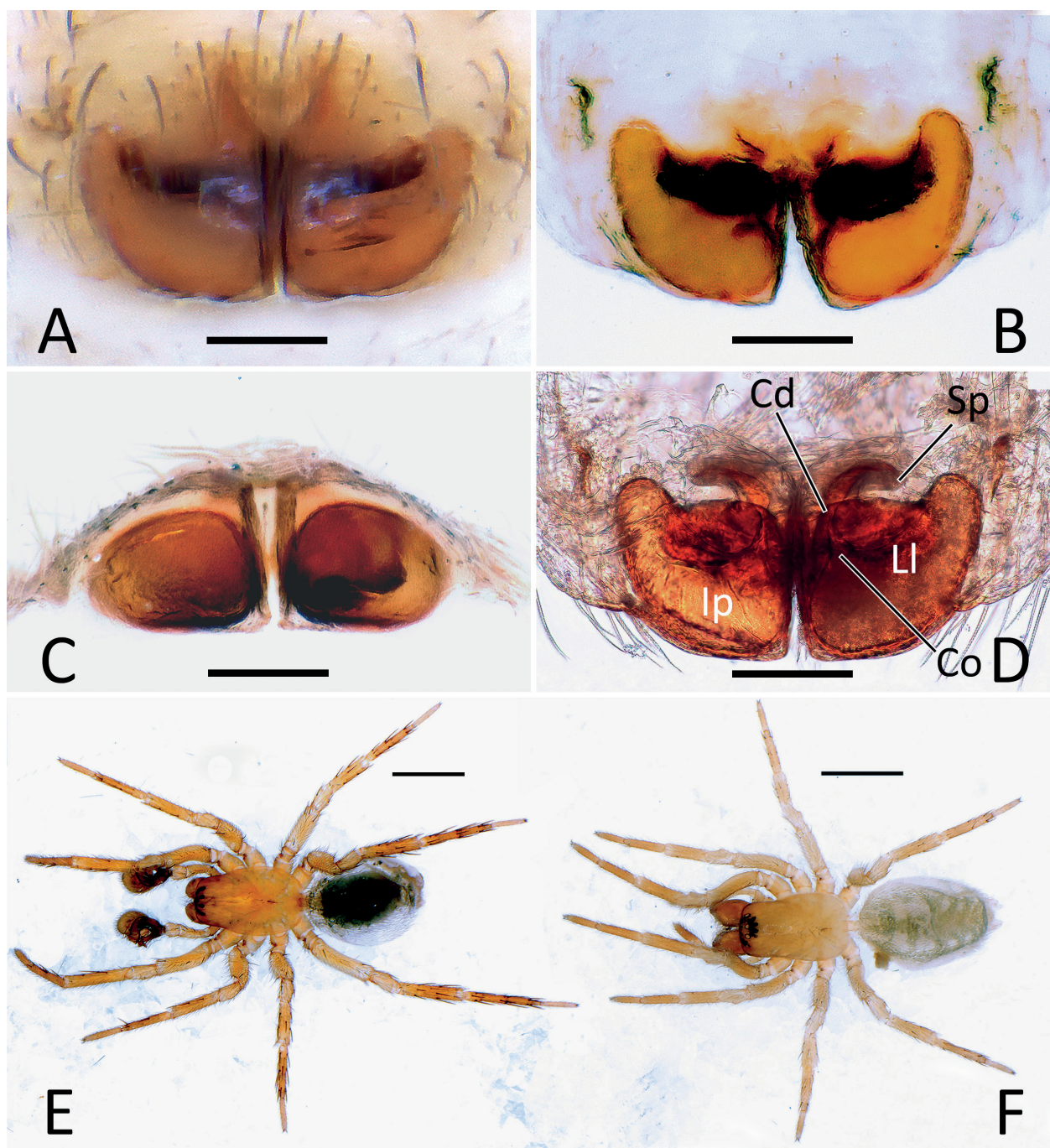


Figure 2. *Cybaeopsis lodovicii* sp. nov., male and female. **A** epigyne, ventral view; **B** ditto, ventral view after maceration; **C** ditto, posterior view; **D** vulva, dorsal view; **E** male habitus, dorsal view; **F** female habitus, dorsal view. Abbreviations: Cd = copulatory duct; Co = copulatory opening; Ip = internal pocket; Ll = lateral lobe; Sp = spermatheca. Scale bars: 0.1 mm (A–D); 1 mm (E, F).

length: 3.25. Carapace 1.55 long, 0.95 wide. Carapace brownish with dorsal slightly darker radiating strips, fovea clearly visible. Cephalic area as in Fig. 3D, darker than thoracic part. Chelicerae dark brown, frontally swollen with 3 posterior and 6 anterior teeth. Eyes sizes and their interdistances: AME = 0.07, ALE = 0.1, PME = 0.06, PLE = 0.1, AME–ALE = 0.01, PME–PLE = 0.08. Legs uniformly brownish. Length of legs segments (for legs II–IV only femora are available for the measurements): I (0.96, 0.44, 0.88, 0.83, 0.61), II (0.95, -), III (0.93, -), IV (1.13, -). Leg formula: IV, I, II, III. Spination as in Table 1. Opisthosoma brown-greyish with lighter

chevrons marks on the dorsal side. Palp as in Figs 1A–H, 3A, B. Palpal femur and patella light brown-yellowish, tibia and tarsus dark brown. Femur approx. 1 and half the length of tibia. Tibia with several long retrolateral setae and 4 dorsal apophyses (Da1–4, Figs 1E, F, 3A). Da1 long and curved heading first retrolaterally and then frontally, proximal part wider and flatter, distal part thin and sharp. Da2 long and thin, headed frontal-retrolaterally and curving ventrally toward the RTA, tip enlarged and with a small notch ending sharply (Fig. 1G). Da3 thin and sharp, headed frontally with an S-shaped course, Da4 short and sharp, headed frontally. RTA elongated and sturdy,

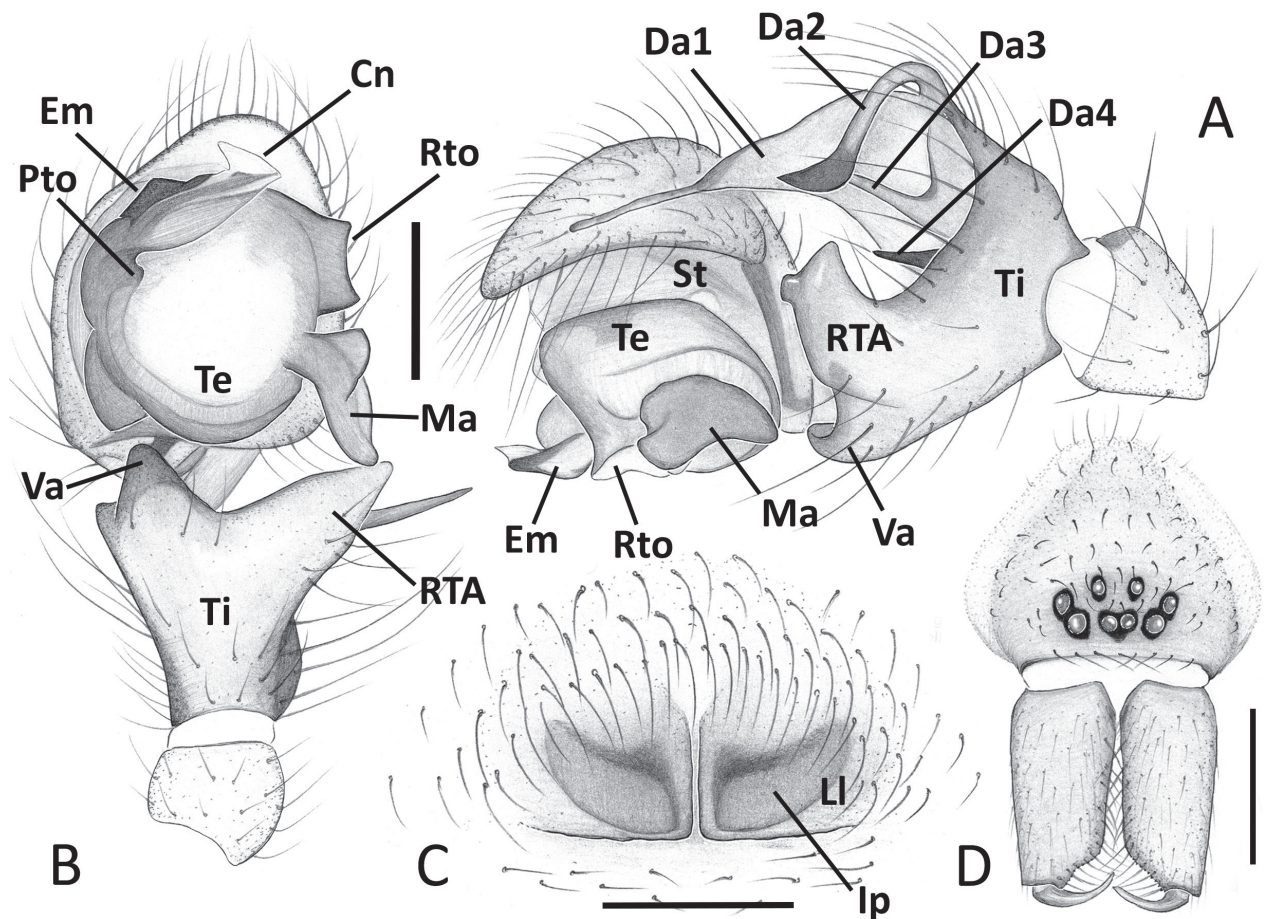


Figure 3. *Cybaeopsis lodovicii* sp. nov., male and female. **A** male palp, retrolateral view; **B** ditto, ventral view; **C** epigyne, ventral view; **D** cephalic area of female, frontal view. Abbreviations: Cn = conductor; Da 1–4 = dorsal apophyses of Tibia; Em = embolus; Ip = internal pocket; L1 = lateral lobe; Ma = median apophysis; Pto = prolateral tegular outgrowth; RTA = retrolateral tibial apophysis; Rto = retrolateral tegular outgrowth; St = subtegulum; Te = tegulum; Ti = tibia; Va = ventral apophysis. Scale bars: 0.2 mm (**A–C**); 0.5 mm (**D**).

approx. as long as tibia, bent dorsally, slightly forked at the tip. Ventral tibial apophysis (Va) short and blunt. Cymbium as long as tibia. Bulb round and dorsoventrally flattened. Median apophysis (Ma) of bulb trapezoid and sturdy with 2 blunt subdivisions headed posteriorly and retrolaterally. Prolateral tegular outgrowth (Pto) inconspicuous. Retrolateral tegular outgrowth (Rto) wide and flat. Both tegular outgrowths only slightly protruding from tegulum. Conductor (Co) wide. Embolus (Em) short and sturdy, ribbon-like, approx. as long as the conductor, distal part with a slightly S-shaped course (Fig. 3A, B).

Female. Habitus as in Fig. 2F. Total length: 3.04. Carapace 1.35 long, 0.83 wide. Coloration as in male, chevrons on the opisthosoma more visible than in the male. Chelicera with 3 posterior and 5 anterior teeth. Eyes sizes and their interdistances: AME = 0.04, ALE = 0.1, PME = 0.07, PLE = 0.12, AME-ALE = 0.02, PME-PLA = 0.13. Length of legs segments (leg III missing): I 2.94 (0.86, 0.4, 0.65, 0.57, 0.46), II 2.68 (0.96, 0.25, 0.57, 0.53, 0.37), III (-), IV 3.04 (0.85, 0.4, 0.67, 0.72, 0.4).

Leg spination as in Table 1. Calamistrum clearly visible, about 2/3 of metatarsus length. Other characters as in male. Epigyne as in Figs 2A–D, 3C. Epigynal plate divided into two lateral lobes (L1) and a septum. Copulatory

openings (Co) located in the antero-median inner part of lateral lobes. Internal pockets (Ip) of lateral lobes wide, comma-like, narrowing laterally, visible by transparency through tegument of epigyne. Copulatory ducts (Cd) short, comma-like, proximal traits parallel to each other in medial part of vulva and then diverging laterally. Spermathecae (Sp) small, separated from each other more than 4 times their diameter, located in anterior side of vulva.

Distribution. Endemic to Northern Apennines, Italy.

Table 1. Leg spination of male and female *C. lodovicii* sp. nov. Variability in number of spines among right and left legs is reported in parentheses. Abbreviations: d = dorsal spines, p = prolateral spines, r = retrolateral spines; v = ventral spines.

Male	Femur	Tibia	Metatarsus
I	d1(2) r1	d2 p2 r2 V2-2	d2 p3 r3 v2-2-3
II	d1 p1	p1(2) v2-2	p2 v2-2-3
III	d2 p1 r1	d1 p2 r2 v1-2-2	d2 p3 r3 v2-2-3
IV	d1(2) r1	d2 p2 r2 v1-2-2	d3 p3 r3 v2-2-3
Female	Femur	Tibia	Metatarsus
I	d1 p1	p1 v1-2-1	p1 v2-1-1
II	d1 p1	p1 v1	v1-3
III	d1(2) p1 r1	d1 p2 r2 v1-(1)	d1 p3 r3 v2-3
IV	d1(2)	d1 p1 r2 v1-2-2	p3 r3 v2-1-3

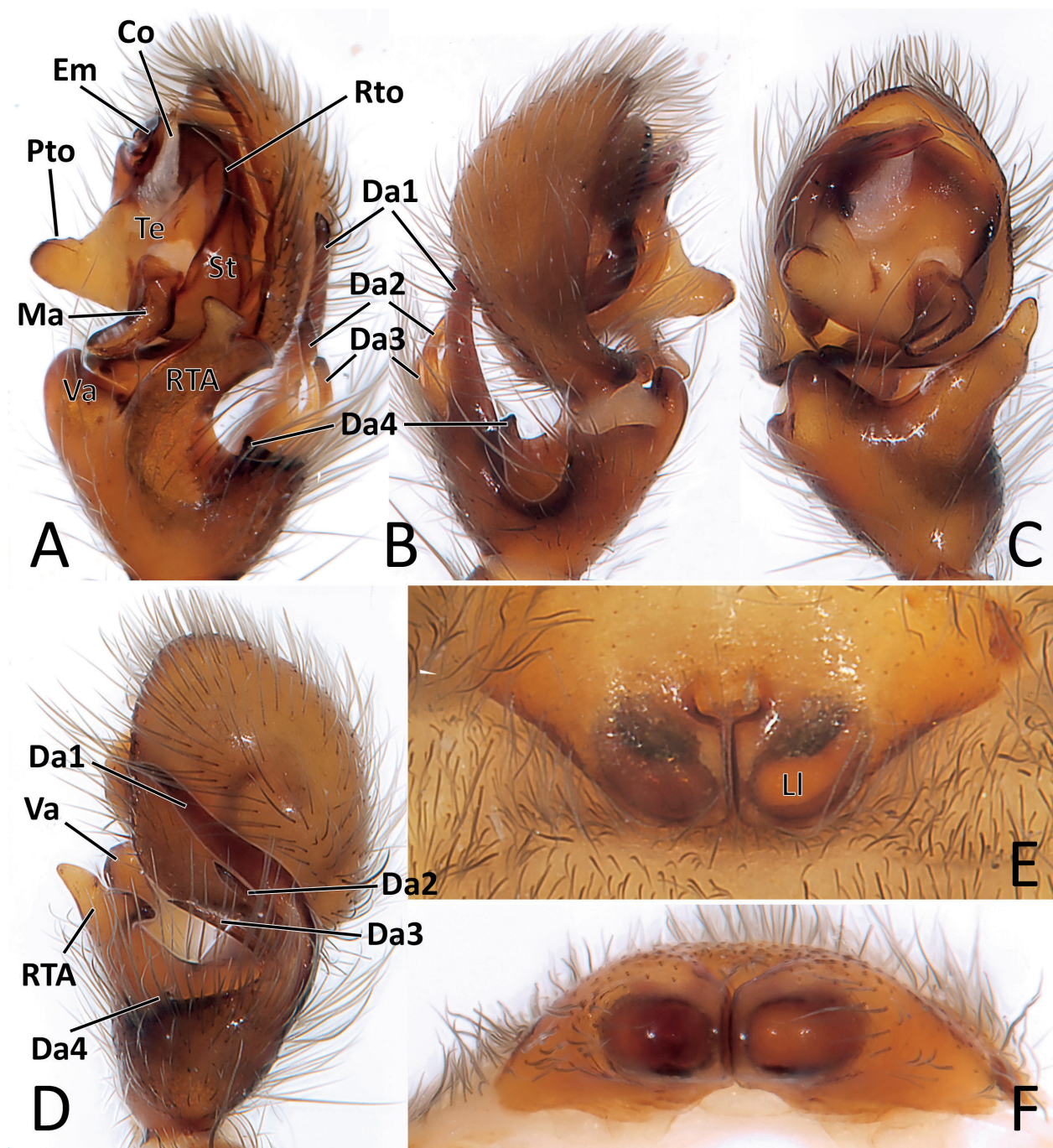


Figure 4. *Cybaeopsis typicus*, male and female from Kunashir Island. **A** male palp, retrolateral view; **B** ditto, prolateral view; **C** ditto, ventral view; **D** ditto, dorsal view; **E** epigyne, ventral view; **F** ditto, posterior view. Photos by Y.M. Marusik Abbreviations: Co = conductor; Da 1–4 = dorsal apophyses of tibia; Em = embolus; Ll = lateral lobe; Ma = median apophysis; Pto = prolateral tegular outgrowth; RTA = retrolateral tibial apophysis; Rto = retrolateral tegular outgrowth; St = subtegulum; Te = tegulum; Va = ventral apophysis.

Habitat. Litter of mountain beechwoods at mid-elevation (~800 m).

***Cybaeopsis theoblicki* (Bosmans, 2021) comb. nov.**

Callobius theoblicki Bosmans, 2021: 879, 32–41 (♂♀).

Diagnosis. See Bosmans 2021 and diagnosis of *C. lodovicii* sp. nov.

Description. See Bosmans 2021.

Distribution. Portugal.

Habitat. Litter of *Pinus* and *Quercus* forests at low and middle mountain range (from 160 to 890 m, see Bosmans 2021)

Remarks. *Cybaeopsis theoblicki* shows the typical morphological characters of *Cybaeopsis*, in particular: a retrolateral tibial apophysis ending bifurcated, three dorsal apophyses in the male palpal tibia two of which elongated and sharp, epigyne lacking a median lobe, and lateral lobes of epigyne extended laterally with a flat posterior margin. All these characters can be easily observed in the

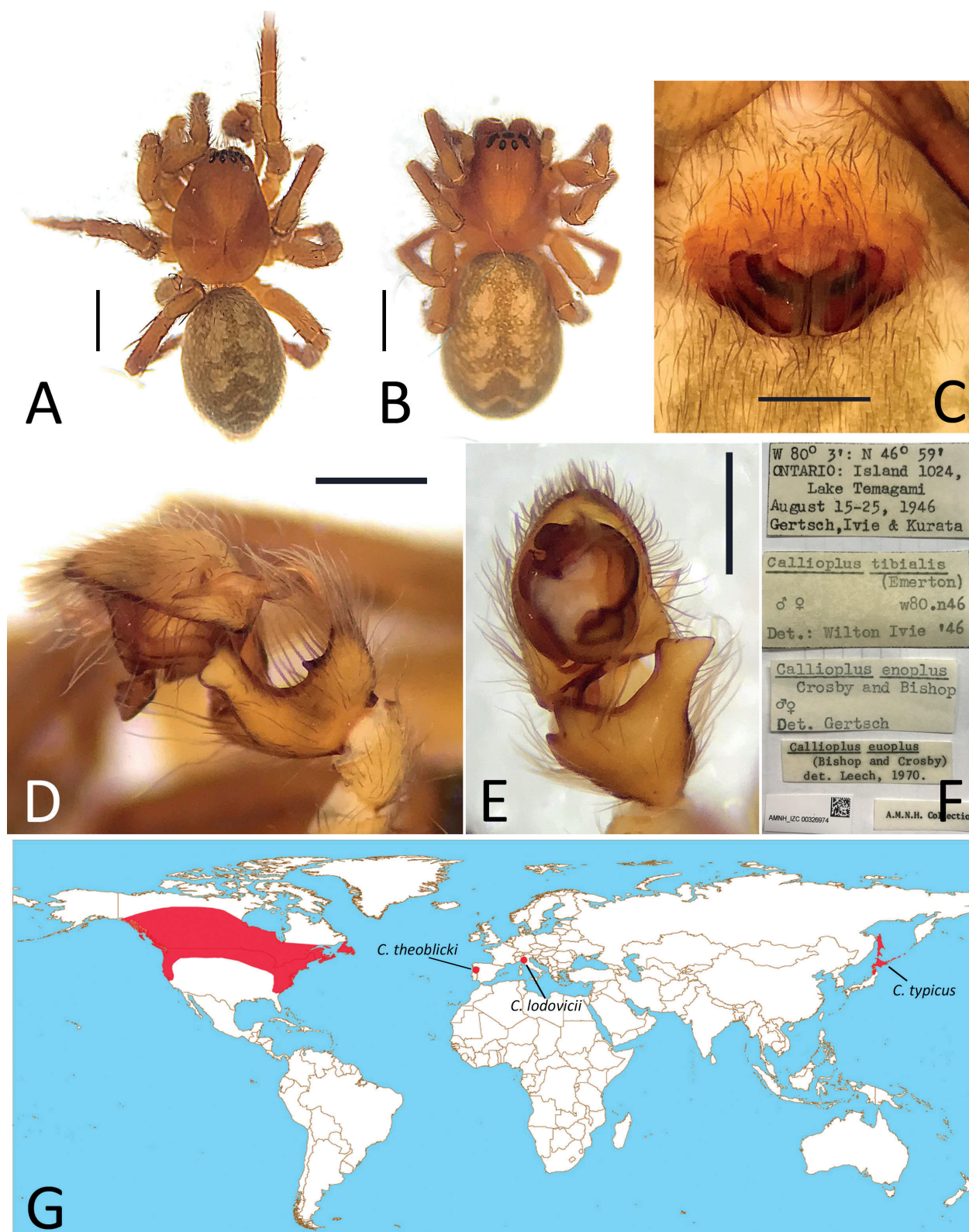


Figure 5. *Cybaeopsis euopla*, male and female from Ontario. **A** male habitus, dorsal view; **B** female habitus, dorsal view; **C** epigyne, ventral view; **D** male palp, retrolateral view; **E** ditto, ventral view; **F** original sample labels; **G** distribution of the genus *Cybaeopsis*. Scale bars: 1 mm (**A**, **B**); 0.5 mm (**C**–**E**).

photos illustrated in Bosmans (2021). The size range reported for the species (3.8–4.5 mm) further supports its affinity with the genus *Cybaeopsis* rather than *Callobius*. Based on these characters, the transfer of *C. theoblicki* to the genus *Cybaeopsis* is herein proposed.

Discussion and conclusions

Several new species belonging to the family Amaurobiidae have been described in Europe in recent years, from Northern Apennines in Italy (*Amaurobius pesarinii*

Ballarin & Pantini, 2017), Minorca (*A. minorca* Barrientos & Febrer, 2018), the Caucasus mountains (*A. caucasicus* Marusik, Otto & Japoshvili, 2020), and Portugal (*Cybaeopsis theoblicki* (Bosmans, 2021)) (Nentwig et al. 2022). The majority of the known and newly described species are from Southern Europe and, in particular, from the Mediterranean region. This area represents a hotspot of spider diversity which is still scarcely explored. With this work we add one more genus and species to the European amaurobiid fauna, further increasing the diversity of this family in the Western Palaearctic. Currently, Amaurobiidae in Europe consists of 44 species belonging to 5 genera: *Amaurobius* C. L. Koch, 1837 (38 species), *Arctobius* Lehtinen, 1967 (1 species), *Callobius* Chamberlin, 1947 (2 species), *Cybaeopsis* Strand, 1907 (2 species), and *Ovtchinnikovia* Marusik, Kovblyuk & Ponomarev, 2010 (1 species) (Nentwig et al. 2022 and the present paper). The finding of *Cybaeopsis* in Southern Europe was unexpected, as the new localities are far from the previously known range of the genus and in an unforeseen environment. The updated distribution of *Cybaeopsis* indicates that the area of distribution of this genus is fragmented between three strongly disjunct areas: North America, North-Eastern Asia and South Europe (see Fig. 5G). This opens the door for new and challenging hypotheses about the origin and historical biogeography of these spiders, which warrant further exploration in the future. The rather uniform general morphology of copulatory organs and the disjunct distribution may suggest that this is a potential relict group once distributed in a wider area. A similar distribution is also shared by other genera of Amaurobiidae (e.g. *Callobius*, *Amaurobius*) or even other families (Y.M. Marusik & Z. Zhao, in litteris). Such results may suggest a common evolutionary history as a consequence of long-range dispersions or fragmentations of wider distributions related to ancient climatic and geological events. In addition, *Cybaeopsis* species have previously been considered to have rather frigidophilic preferences, being often associated with shadowed, cool and humid environments (Paquin and Dupérré 2003). In this regard, regions at higher latitudes and localized habitats with relatively cool and uniform conditions throughout the year (e.g. vegetated narrow valleys) may have acted as a refuge for these spiders. Nevertheless, the new records in Portugal and Italy, in areas which are relatively warm and dry during the summer season, challenge this hypothesis. Such findings imply that our knowledge of the habitat preferences of *Cybaeopsis* is still incomplete and that this genus may have broader environmental tolerance than previously thought. Additional collections and studies on the European *Cybaeopsis* fauna and the comparison of these species with the North American and Eastern Asia congeners in the future may help to better define the ecology, distribution, evolutionary history and microhabitat preference of these spiders.

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