

Two new species of campoplegine ichneumonid wasps (Hymenoptera, Ichneumonidae, Campopleginae) from Germany

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Cymodusa germanica sp. n. and *Eriborus elpis* sp. n. are described from Germany. *Meloboris miae* Haraldseide, 2021 is reported from Germany for the first time.

Key words: Hymenoptera, Ichneumonidae, Campopleginae, *Cymodusa*, *Eriborus*, *Meloboris*, new species, Germany, Europe.

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Introduction

Campopleginae is a species rich subfamily in the hymenopteran family Ichneumonidae. Historically the subfamily has been poorly studied, but in recent years there have been increased efforts to better understand the diversity in the group (Klopfstein *et al.* (2022)), and several genera have received special attention (e.g. Galsworthy *et al.* (2023), Haraldseide (2021), Riedel (2017, 2018), Vas (2019, 2022)). The current study is a contribution to the knowledge of the diversity of Campopleginae with the description of two new species from Germany. The recently described *Meloboris miae* Haraldseide, 2021 is reported from Germany for the first time, hitherto known only from Norway and Sweden (Haraldseide (2021), Klopfstein *et al.* (2022)).

Material and methods

The author was given the opportunity to study ichneumonid wasps from Germany, collected in Malaise traps in 2011 and 2015 by Dieter Doczkal,

Johannes Voith, and Axel Ssymank on behalf of the Zoologische Staatssammlung Munich (Munich, Germany). The material included several interesting specimens and new records for Germany, some of which were discussed in Haraldseide (2023). The DNA barcode for the new *Cymodusa* Holmgren, 1859 described below is available in the Barcode of Life Database (Ratnasingham & Hebert (2007, 2013)). The BOLD Sample ID is included under the respective record. The new *Cymodusa* have been compared to photographs of the *Cymodusa kasparyani* Dbar, 1984 holotype. Terminology follows Broad *et al.* (2018).

Cymodusa Holmgren, 1859

Cymodusa is a moderately sized genus known from the Holarctic, Oriental and Afrotropical regions, with highest diversity in the Holarctic realm. Females are usually easily recognized by the strongly converging and hairy eyes. The exception being *Cymodusa (Diverdusa) combinator* (Aubert, 1974) which is a morphologically intermediate

species, lacking the strongly converging eyes. Males are less distinct. Dbar (1984, 1985) revised the Palearctic species and provided a key (note that *C. cruentata* (Gravenhorst, 1829) is missing from the English translation). Two European species have later been described from Turkey (Kolarov & Çoruh (2008), Kolarov & Yurtcan (2008)), and Riedel (2022) described a new species from Norway. Vas (2022) proposed two new synonyms, described one species from Turkmenistan and provided notes on biogeography of several species. Sanborne (1986, 1990) revised the Nearctic species and Watanabe (2020) revised the Japanese species. Li *et. al.* (2021) provides a key to the species of China and the Oriental Region.

***Cymodusa germanica* sp. n.** (Figures 1A, 2A, B)

Material: Holotype: GERMANY: Baden-Wuerttemberg, Grenzach Mal.-F.4, Rotelstein, Steinbruch (47.556N, 7.679E). 435 m. 22. July – 12. August 2011, 1♀. Leg. D. Doczkal & A. Ssymank. Coll. Zoologische Staatssammlung Munich (Munich, Germany).

Etymology: The specific epithet is in reference to the country of origin of the holotype.

Diagnostic characters: Areolet open, costulae missing, genal carina incomplete, hind tibia light basally and eyes strongly converging ventrad. The new species keys to *Cymodusa kasparyani* Dbar, 1984 in Dbar (1985), in this species the eyes are less converging, and the colours are lighter.

Description: *Female:* Antennae with 30 flagellomeres, first segment 3.9 times as long as wide, preapical flagellomeres slightly longer than wide. Head finely coriaceous. Temples 0.4 as wide as eye in lateral view. Genal carina disappearing well above level of lower eye margin. Posterior interocellar distance and posterior ocellus to eye distance 1.3 times as long as diameter of ocellus. Eyes strongly converging, shortest distance 0.5 times width of frons. Clypeus slightly convex. Mandibles with upper tooth slightly longer than lower.

Mesosoma coriaceous. Epomia moderately strong. Propleuron somewhat shiny with strong longitudinal striae. Mesopleuron with punctures disappearing against coriaceous background.

Speculum large, shining. Epicnemial carina strong, but unmodified. Posterior transverse carina complete. Mesoscutum impunctate, notauli indicated in the form of faint striae. Scuto-scutellar groove matte. Spiracles small, circular. Propodeal carinae moderately strong, costulae missing, area superomedia open posteriorly. Combined area superomedia and area petiolaris with transverse striae.

Forewing 3 mm. Wings hyaline. Nervulus (vein 1cu-a) interstitial. Vein 2rs-m about twice as long as 2+3M. Nervellus (1Cu and cu-a) vertical, discoidella (2Cu) indiscernible (probably present as a crease). Claws with 1-2 observable teeth.

Petiole basally and laterally shiny almost smooth. Postpetiole coriaceous dorsally, glabrous in apical 0.2. Metasoma coriaceous but somewhat shiny. Thyridia large. Tergite I 3 times, and tergite II 2 as long as apically wide. Last tergite incised. Ovipositor sheaths approximately 0.6 times as long as hind tibia.

Colour: Antennae brownish-black, scape basally, pedicel apically and annellus brownish. Mandibles except for teeth and palps yellowish. Mesosoma black, tegulae yellowish. Coxa I reddish brown, trochanter and trochantellus yellowish. Femur and tibia I and II red, lighter basally and medially. Coxa II dark brown, trochanter brownish, apically yellowish. Coxa III black, trochanter almost completely black, trochantellus yellowish. Femur III reddish brown. Tibia III yellowish red with a clear light basal mark, darkened sub basally and apically. All tarsi darkened. Tibial spurs yellowish, darkened in apical half. Metasomal tergite I black. Tergite II with apical 0.15 reddish brown with a dark posterior rim. Thyridia red. Tergite III and IV dark brown and slightly lighter in apical 0.4. Tergite V - VII brown. Ovipositor sheaths brown. Sternites light brown.

Male: Unknown

***Eriborus* Förster, 1869**

In a Western Palearctic context *Eriborus* is a small genus of only nine known species, including the species described here. The genus is more diverse

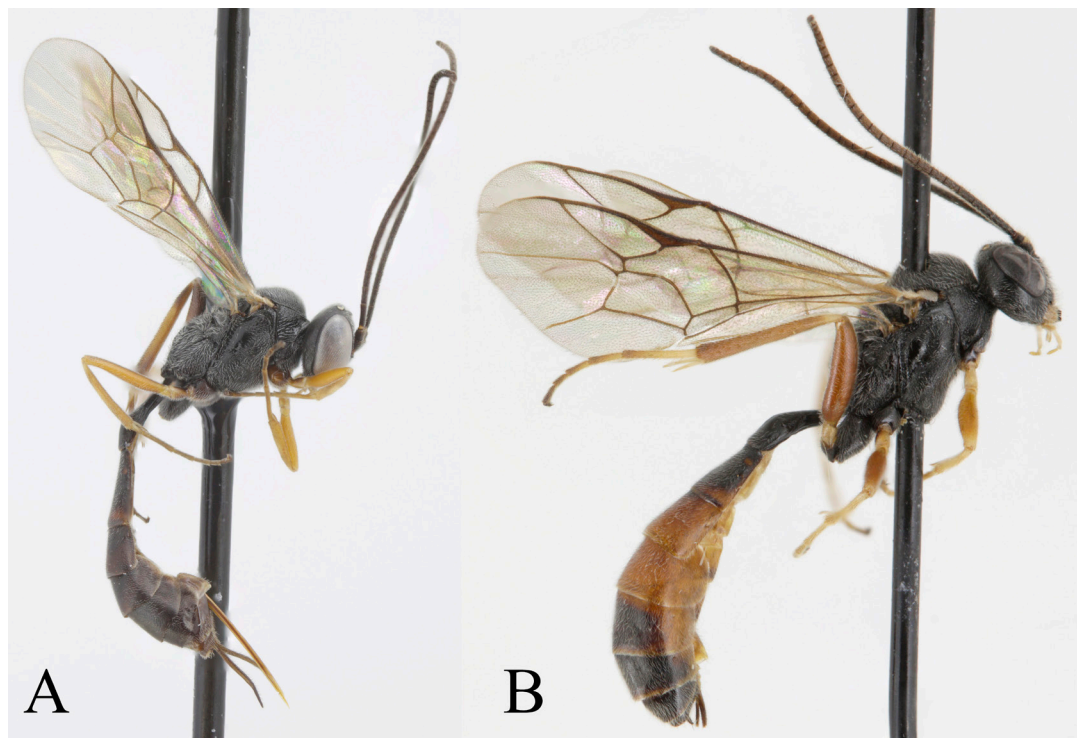


FIGURE 1. Habitus. **A.** *Cymodusa germanica* sp. n. **B.** *Eriborus elpis* sp. n.

in the (sub-)tropics, especially in the Eastern and Oriental Regions. Worldwide there are 56 described species (Vas (2019)). Recognition of the genus can be tricky as they share some characters with other genera: *Diadegma* Förster, 1869 (species with an open areolet), *Enytus* Cameron, 1905 (especially outside the Western Palearctic) and *Breviterebra* Kusigemati, 1982 (where 1Cu and cu-a (the nervellus) is intercepted, but 2Cu is in the form of a faint crease). Consult Klopstein *et al.* (2022) and Haraldseide (2023) for discussions on characters. Horstmann (1987) provided a key to European species, a revision of Eastern Palearctic and tropical species is lacking.

***Eriborus elpis* sp. n.** (Figures 1B, 2C, D)

Material: Holotype: GERMANY: Bavaria: Ammergebirge: Saegertal: Schluchtwald (47.572N, 10.881E). 1430 m. 26. June – 22. July 2015, 1♀. Leg. D. Doczkal & J. Voith. Coll. Zoologische Staatssammlung Munich (Munich, Germany)

Etymology: The species is named after Elpis,

the Greek spirit of hope. The name is to be treated as a noun in apposition.

Diagnostic characters: Genal carina complete, mid and hind coxae black and hind femur red. In Horstmann (1987) the new species keys to *Eriborus rufopictus* Horstmann, 1987 which is a more slender and lighter coloured species with the most striking difference in the width of the temples.

Description: *Female:* Antennae with 25 flagellomeres, first segment 3.9 times as long as wide, preapical flagellomeres slightly longer than wide. Head coriaceous, face with rougher sculpture. Temples as wide as eye in lateral view, with a glabrous, shining strip behind eyes. Genal carina joining the hypostomal carina some distance from mandibular base, neither much raised. Posterior interocellar distance just above 1 time and posterior ocellus to eye distance 1.3 times as long as diameter of ocellus. Clypeus wide, about 0.8 times as wide as frons. Apical margin with a shallow median depression, almost straight. Mandibles with ventral carina, teeth of

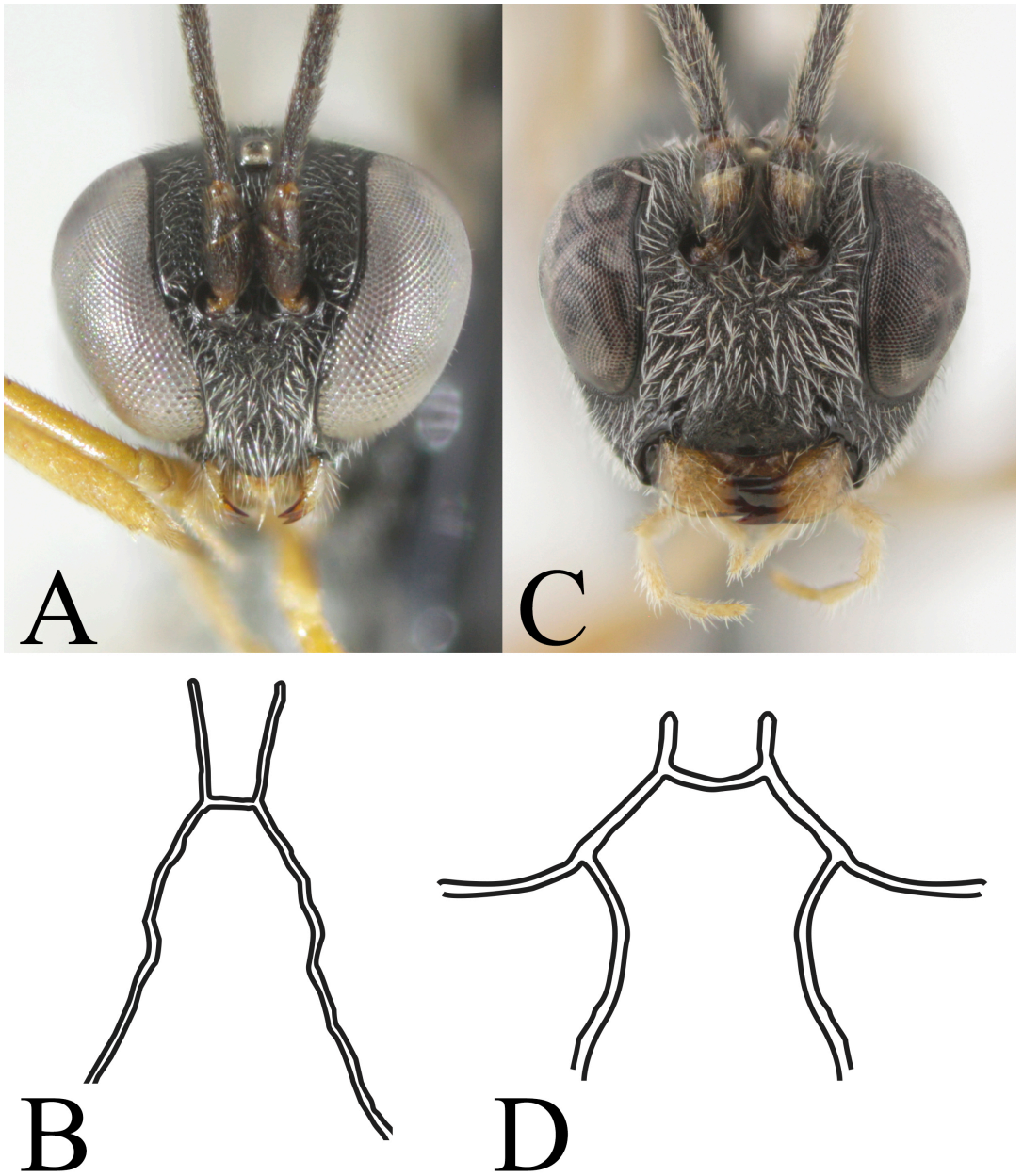


FIGURE 2. A, B. *Cymodusa germanica* sp. n. A. Head frontal view, B. Carinae of propodeum. C, D. *Eriborus elpis* sp. n. C. Head frontal view, D. Carinae of propodeum.

equal length.

Mesosoma coriaceous without strong rugosity. Epomia weak. Mesopleuron with punctures disappearing against coriaceous background. Some rugosity (antero-)medially. Speculum shining. Epicnemial carina strong, but unmodified.

Posterior transverse carina complete. Mesoscutum impunctate, notauli indiscernible. Scuto-scutellar groove shiny. Propodeum somewhat shiny. Spiracles small, circular. Propodeal carinae complete, costulae present, area superomedia open posteriorly. Area petiolaris with reticulate

rugosity.

Forewing 5 mm. Wings hyaline. Nervulus (vein 1cu-a) postfurcal by the width of vein 1cu-a. Hind femur 4.5 times as long as wide. Claws with 1-2 observable high teeth.

Petiole laterally shiny with irregular longitudinal grooves anterior to small and shallow glymmae. Postpetiole coriaceous dorsally. Metasoma coriaceous but somewhat shiny. Thyridia large. Tergite I 2.5 times as long as apically wide. Ovipositor sheaths approximately 0.2 times as long as hind tibia.

Colour: Antennae brownish, black in basal 0.3, scape and pedicel black, each with a yellowish-brown mark ventrally. Mandibles except for teeth and palps yellowish. Mesosoma black, tegulae white. Coxa I black basally, yellowish in apical 0.5, trochanter and trochantellus yellowish. Femur and tibia I red. Coxa II black with a small apical yellowish mark, trochanter with a brown mark, trochantellus yellowish. Femur and tibia II red. Coxa III black, trochanter almost completely black, trochantellus yellowish. Femur III red. Tibia III red with a clear light basal mark. All tarsi yellowish with last segment darkened. Tarsus III with each tarsomere slightly darkened distally. Tibial spurs yellowish. Metasomal tergite I black. Tergite II with apical 0.2 red and black stripe posterior to this. Thyridia red. Tergite III and IV red. Tergite V red with a large black dorsal saddle. Tergite VI largely black with a red apical rim. Tergite VII and ovipositor sheaths black. Sternites yellowish.

Male: Unknown

***Meloboris* Holmgren, 1859**

European *Meloboris* of the *Nepiera*-group was treated by Haraldseide (2021). Horstmann (2004) treated *Meloboris* s. str.

***Meloboris miae* Haraldseide, 2021**

Material: GERMANY: Bayern, Garmisch-Partenkirchen. Gsteigstrasse 43, 47.48857N 11.12600E, 816m, 2–20. September 2018, 1♀, leg. D. Doczkal & V. Voith.

Discussion

Both species described here agree well with current understanding of generic boundaries. *Cymodusa* is generally clearly defined (but see notes on *Diverdusa* above). In a wider scope *Eriborus* is more problematic, the genus is most diverse outside the Western Palearctic and the generic boundaries are not yet fully understood. Chimeno *et. al.* (2022) demonstrated that there is a substantial number of undiscovered taxa in Europe, exemplified by selected families of Diptera, and there is little reason to believe that their results does not also apply, to a larger or lesser degree, to other groups. With the application of efficient modern methods in combination with traditional taxonomy we will see a rise in taxa, even in well-studied Central Europe.

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