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On the taxonomy and zoogeography of some West Palaearctic *Cypha* species (Coleoptera: Staphylinidae: Aleocharinae)

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ASSING V. 2020: On the taxonomy and zoogeography of some West Palaearctic *Cypha* species (Coleoptera: Staphylinidae: Aleocharinae). *Acta Musei Moraviae, Scientiae biologicae* **105(1):** 11–26. – Three species are (re-)described and illustrated: *Cypha squamipennis* (Fauvel, 1902), *C. carinthiaca* (Scheerpeltz, 1958), and *C. bisinuata* sp. nov. (South Italy). Based on an examination of types and additional material, *C. hanseni* (Palm, 1949) is removed from synonymy with *C. seminulum* (Erichson, 1839) and synonymized with *C. pulicaria* (Erichson, 1839). A revision of material of species of the newly established *C. spathulata* group (including *C. spathulata* Assing, 2007, *C. graeca* Assing, 2004, *C. lindbergi* (Palm, 1935), and *C. bisinuata*) revealed an allopatric distribution pattern in the Mediterranean and Caucasus regions. The distributions of these species are mapped. The male primary sexual characters of *C. seminulum*, *C. pulicaria*, and of the species of the *C. spathulata* group are illustrated. *Cypha seminulum* is reported from Portugal and Georgia for the first time.

Keywords. Coleoptera, Staphylinidae, Aleocharinae, *Cypha*, taxonomy, new species, (re-)descriptions, new synonymy, new records, West Palaearctic region, zoogeography, distribution map

Introduction

Species of *Cypha* Leach, 1819 are minute insects with a body length of usually less than 2 mm. Species other than the common *C. longicornis* (Paykull, 1800) are generally found rarely and accidentally, mostly by sifting, with car-nets, and with eclectors. Their study, identification, and an understanding of their taxonomy and zoogeography are further hampered by the fact that most species are reliably identified only based on an examination of the aedeagus, but appear to be subject to an unfavourable sex ratio (for the taxonomist), with males being rarer than females. Moreover, changing interpretations and synonymies in previous synopses, keys, and revisions (PALM 1936, LOHSE 1974, DAUPHIN 2004, 2006) have obscured the identities of some species.

According to a recent contribution, the genus *Cypha* Leach, 1819 was represented in the Palaearctic region by 50 species, 39 of them distributed in the West Palaearctic (including Middle Asia) and eleven in the East Palaearctic regions (ASSING 2014). In the meantime, an additional species was described from Norway by ØDEGAARD & HANSSEN (2018).

In the first of a small series of contributions to the taxonomy of *Cypha*, DAUPHIN (2003) examined the type material of *C. seminulum* (Erichson, 1839), designated a lectotype, illustrated the aedeagus, and synonymized *C. hanseni* (Palm, 1949) with this name. This synonymy was based on the diagnostic characters provided by PALM (1936, 1949, 1966). In a more comprehensive study of several *Cypha* species recorded from West Europe, DAUPHIN (2004) illustrates the aedeagi of two *C. seminulum* males with

differently shaped internal structures. In this article, he also states that he examined a female syntype of *C. pulicaria* (Erichson, 1839) and figures the aedeagus, without specifying where the corresponding male was collected. A revision of material previously identified as *C. seminulum* and *C. pulicaria* based on Dauphin (2003, 2004) revealed considerable confusion, which is addressed in the present paper.

Staphylinidae material recently collected in South Spain included a *Cypha* male, which, based on the illustrations provided by Dauphin (2004, 2006), was at first assumed to represent an undescribed species. A subsequent comparison with type material, however, revealed that it is conspecific with *C. squamipennis* (Fauvel, 1902). This species is redescribed and illustrated below.

Moreover, previous records of three closely related species from the Mediterranean have resulted in an implausible distribution pattern. In order to clarify the zoogeography of this species group, material was re-examined and the records and distributions were revised and rectified.

Material and methods

The material treated in this study is deposited in the following collections:

IRSNB . . . . . Institut Royal des Sciences Naturelles de Belgique, Bruxelles (Y. Gérard)
MNB . . . . . Museum für Naturkunde Berlin
(incl. coll. Schülke; J. Frisch, B. Jaeger, M. Schülke)
NHMW . . . . . .Naturhistorisches Museum Wien (H. Schillhammer)
cAss . . . . . author´s private collection
cCol . . . . . private collection Martin Collier, Dereham
cFel . . . . . private collection Benedikt Feldmann, Münster
cLan . . . . . private collection Steve Lane, East Winch
cMey . . . . . private collection Heinrich Meybohm, Großhansdorf
cWun . . . . . private collection Paul Wunderle, Mönchengladbach

The morphological studies were conducted using Stemi SV 11 (Zeiss) and Discovery V12 (Zeiss) microscopes, as well as a Jenalab compound microscope (Carl Zeiss Jena). The images were created using a digital cameras (Axiocam ERc 5s, Nikon Coolpix 995), as well as Labscope and Picolay software. The map was created using MapCreator 2.0 (primap) software.

Body length was measured from the anterior margin of the labrum to the abdominal apex, the length of the forebody from the anterior margin of the labrum to the posterior margin of the elytra, elytral length at the suture from the apex of the scutellum to the posterior margin of the elytra, and the length of the aedeagus from the apex of the ventral process to the base of the aedeagal capsule. The "parameral" side (i.e., the side where the sperm duct enters) is referred to as the ventral, the opposite side as the dorsal aspect.

Results

Cypha squamipennis (Fauvel, 1902) (Figs 1–6)

Hypocyptus squamipennis Fauvel, 1902: 183.

Type material examined. Holotype ♂: "Bordj Men Aïl, Kabylie / *squamipennis* Fvl / R.I.Sc.N.B. 17.479, *Hypocyptus*, Coll. et det. A. Fauvel / Type / Holotypus *Hypocyptus squamipennis* Fauvel, rev. V. Assing 2004 / *Cypha squamipennis* (Fauvel), det. V. Assing 2004 / Holotype" (IRSNB).
Additional material examined. Spain: 1♂, Cádiz, E Facinas, Embalse de Almodóvar, 36°09′N, 5°38′W, 100 m, under stones, 25.XII.2017, leg. Forcke (cAss).

Comment. The original description is based on "Un exemplaire" from "Borj-Men Aïl" (Fauvel 1902).

Redescription. Body length 1.5 mm; length of forebody 0.85 mm; width of pronotum 0.70 mm. Habitus as in Fig. 1. Coloration: body black with the lateral margins of the pronotum diffusely and narrowly paler; legs brown with pale-yellowish tarsi; antennae dark-brown with the basal three antennomeres pale-brown.

Head strongly transverse; punctation very fine and sparse; interstices with transverse microsculpture. Antenna 0.6 mm long, with moderately distinct club formed by antennomeres VIII–X; antennomeres IV–X distinctly oblong.

Pronotum strongly transverse; punctation fine, but distinct, and moderately sparse; pubescence pale and sub-erect; interstices with shallow transverse microsculpture.

Elytra slightly longer than pronotum; punctation similar to that of pronotum; pubescence pale and sub-erect; microsculpture composed of oblique striae. Meso- and metatarsomeres I very long.

Abdomen with fine, but distinct punctation, with dark sub-erect pubescence, and with microreticulation.

♂: protarsomere I slightly dilated and distinctly elongate, much longer than the combined length of protarsomeres II and III; median lobe of aedeagus 0.42 mm long and shaped as in Figs 2–6; internal sac with two pairs of strongly sclerotized apical spines and with long dark membranous structure.

Distribution. Reliable records of this rare species are known only from Algeria and Spain.

Cypha seminulum (Erichson, 1839) (Figs 7–9, 18–20)

Hypocyptus seminulum Erichson, 1839b: 389 f.
Hypocyptus pulicarius: Palm (1936, 1966).
Cypha seminula [sic]: Dauphin (2004), partim.

Type material examined. Lectotype ♂: "5663 / *seminulum* Er., Berol. Er. / Syntype *Hypocyphtus* [sic] *seminulum* Erichson 1839, Hist. Coll. Nr. 5663, Berolin. Erichson, Museum für Naturkunde, Berlin / Hist.-Coll. (Coleoptera), Nr. 5663, *Hypocyphtus seminulum* Er, Berolin. Erichson, Zool. Mus. Berlin / Lectotype" (MNB). Paralectotype ♂: "Hist.-Coll. (Coleoptera), Nr. 5663, *Hypocyphtus seminulum* Er, Berolin. Erichson, Zool. Mus. Berlin / Syntype *Hypocyphtus* [sic] *seminulum* Erichson 1839, Hist. Coll. Nr. 5663, Berolin. Erichson, Museum für Naturkunde, Berlin / Paralectotype" (MNB).

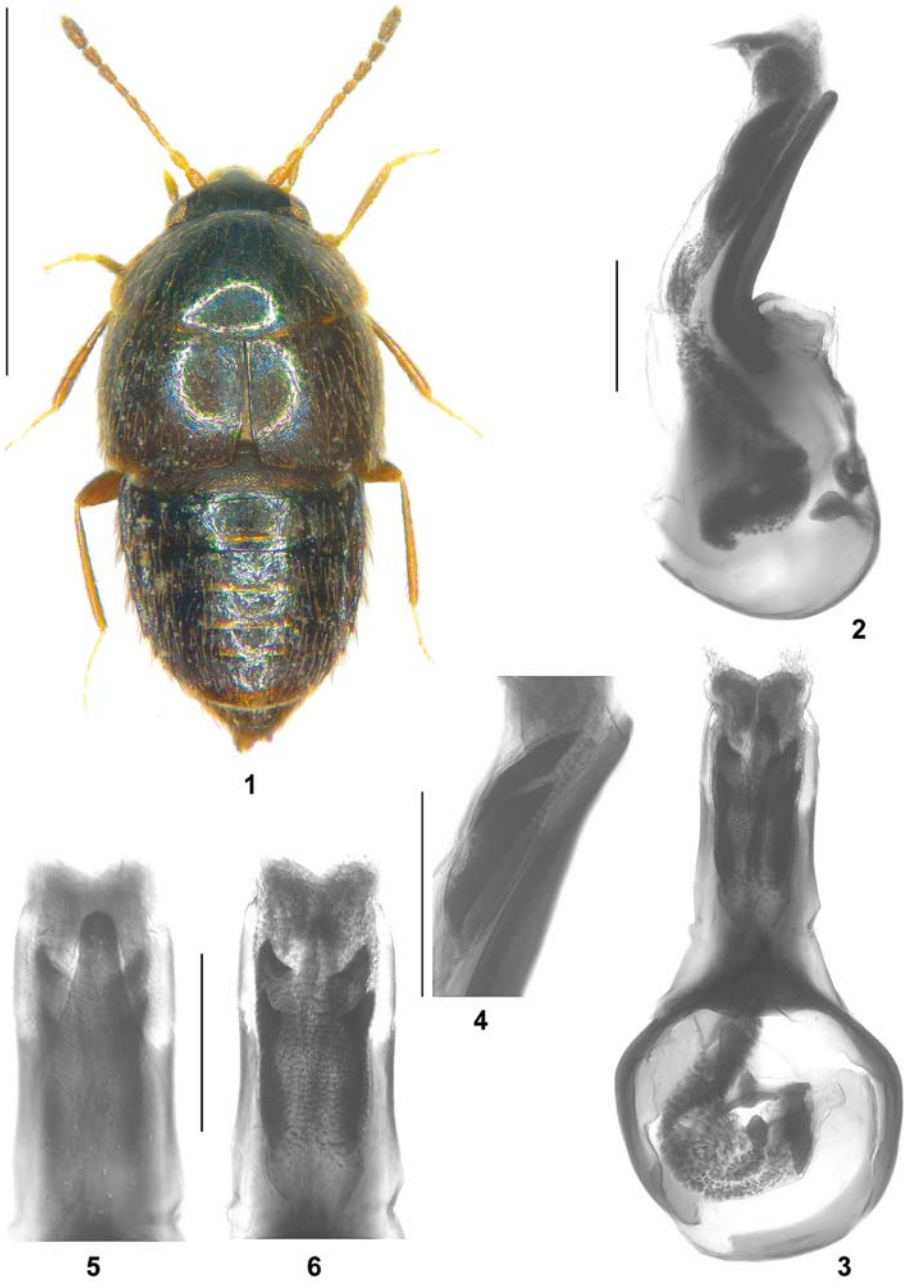
Additional material examined. Portugal: 1♂, SW Montalegre, Parafita, 41°46′N, 7°50′W, 900 m, litter near stream, 22.III.2002, leg. Meybohm (cAss).
Great Britain: Norfolk: 1♂, Hunstanton, dunes, 11.X.2017 (cLan); 1♂, Snettisham, saltmarsh, 10.V.2017 (cLan); 1♂, Brancaster, fore-dunes, 17.IV.2017 (cAss); 1♂, Warham, 3.X.2019 (cCol).
Denmark: 1♂, NW-Seeland, Nekselř, 10.IX.1996, leg. Sprick & Palm (cAss).
Germany: Schleswig-Holstein: 1♂, St. Peter-Ording, 4.XII.1999, leg. Meybohm (cMey); 1♂, Lübke Koog, car-net, 3.VII.1999, leg. Meybohm (cMey); 1♂, Fehmarn, Staberhuk, 13.VIII.2002, leg. Meybohm (cMey); 1♂, Fehmarn, 7–9.IX.1985, leg. Wunderle (Wun). **Niedersachsen:** 1♂, Lüchow-Dannenberg, Schreyahn, car-net, 5.VII.1983, leg. Meybohm (cMey); 1♂, Hameln env., Königsförde, pitfall, 23.VI.1986, leg. Sprick (cAss); 1♀, W Hannover, Bad Nenndorf, garden, 1.V.1990, leg. Assing (cAss); 1♀, Hannover, Eilenriede, beech bark, 12.VI.1991, leg. Assing (cAss); 1♀, Kreis Winsen/Luhe, Tangendorf, car-net, 3.VII.1994, leg. Meybohm (cMey); 1♀, Kreis Rotenburg/Wümme, Forst Ummel, car-net, 17.V.1997, leg. Meybohm (cMey). **Nordrhein-Westfalen:** 1♀, NW Vreden Zwillbrocker Venn, 25.IX.1992, leg. Assing (cAss); 1♂, Bliesheim, 18.VI.1988, leg. Wunderle (cWun); 2♀♀, S Sankt Augustin, Birlinghoven, field barn, 12.XII.1987, leg. Siede (cWun); 1♀, Lübbecke, 23.IX.1983, leg. Renner (cAss). **Hessen:** 1♀, Marburg env., Bracht, 30.VII.1985, leg. Wunderle (cWun); 1♀, Großen-Linden, chicken dung, 14.XII.1985, leg. Wunderle (cWun). **Rheinland-Pfalz:** 1♀, SW Bad Kreuznach, Boos, 5.VI.1987, leg. Siede (cWun).
Austria: Salzburg: 1♂, 1♀, Salzburg, Niedere Tauern, Tamsweg, 1200 m, car-net, 23.VII.1991, leg. Assing (cAss). **Steiermark:** 1♂, Bezirk Feldbach, Bad Gleichenberg, STBR. Klausen, 400 m, 1.III.2000, leg. Holzer (cAss); 1♂, Bezirk Weiz, Anger, Auersbachsiedl., 500 m, 23.IV.1995, leg. Holzer (MNB); 1♀, same data, but 30.IV.1994 (MNB); 1♂, same data, but 20.IV.1992 (cAss); 1♀, St. Johann, Herberstein, Tierpark, 400 m, 11.V.1993, leg. Holzer (MNB). **Niederösterreich:** 1♀, Stockerau, leg. Bernhauer (MNB).
Italy: 1♀, Trentino-Alto Adige, Arco env., road to Mte. Velo, car-net, 21.VI.1989, leg. Wunderle (cWun); 1♀, Sardegna, Catena d. Marghine, Mte. Palai, 1000 m, 12.X.1989, leg. Wunderle (cWun).
Georgia: 1♂, Racha, 10 km W Lentekhi, 42°47′53″N, 42°38′01″E, 1100 m, 20.V.2016, leg. Brachat & Meybohm (cAss).

Comment. This species was described in a work on the beetles of "Mark Brandenburg", based on an unspecified number of syntypes (Erichson 1839b). The two type specimens in the historical collection in MNB, both of them males, were studied by Dauphin (2003), who designated one of them as the lectotype and synonymized *C. hanseni* with *C. seminulum*.

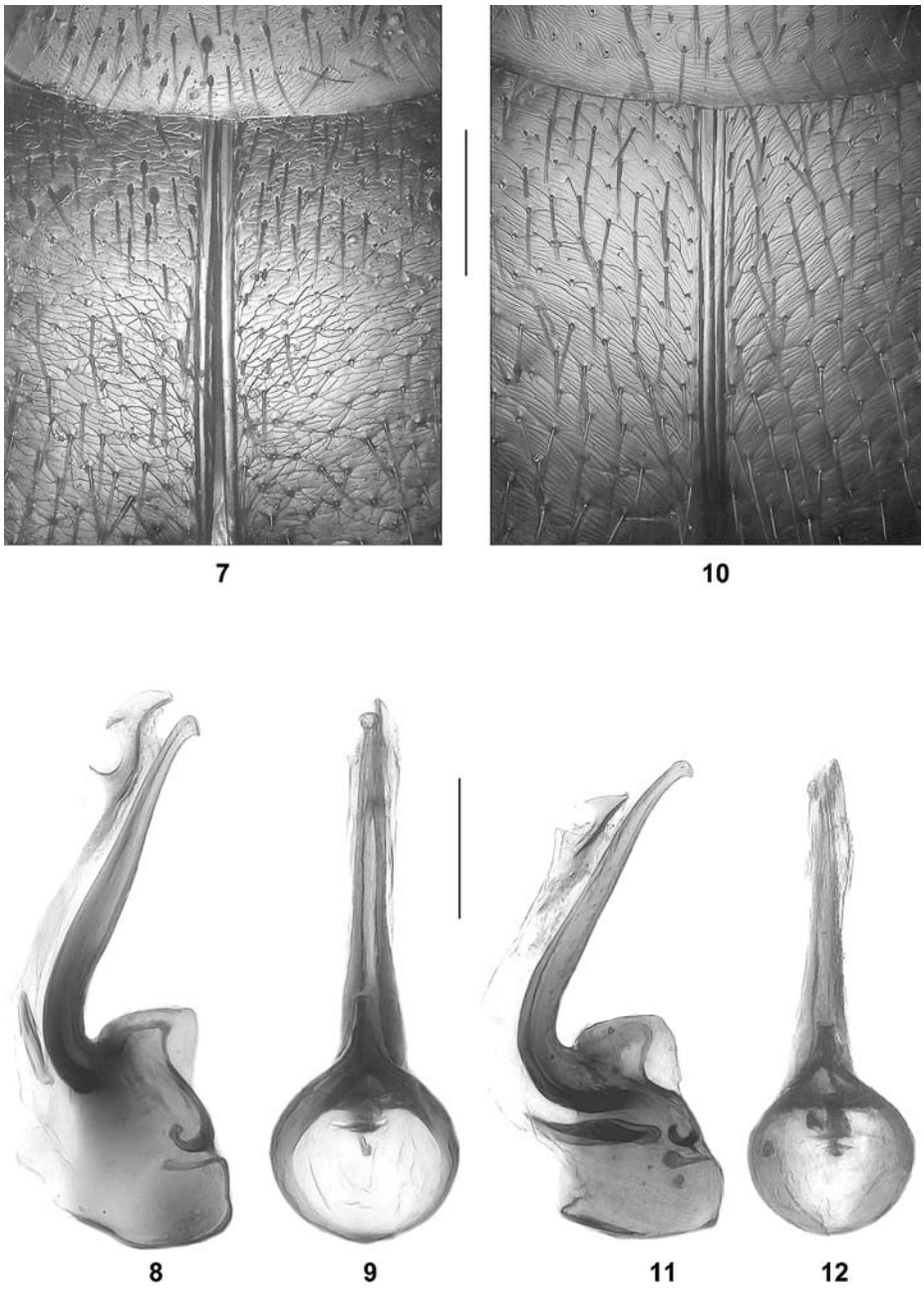
Dauphin (2004) confounded *C. seminulum* and *C. pulicaria*, as can be inferred from the aedeagus figures provided for *C. seminulum* (figure 3a). These figures refer to both *C. pulicaria* (left) and *C. seminulum* (right).

Identification. *Cypha seminulum* is reliably identified based on the morphology of the aedeagus, particularly the distinctive shape of the apical internal structure in lateral view (8–9, 18–20). Females may be distinguished from the similar *C. pulicaria* only by mostly darker legs (particularly darker femora). The elytral microsculpture (Fig. 7) may serve as an additional character, but is not very reliable.

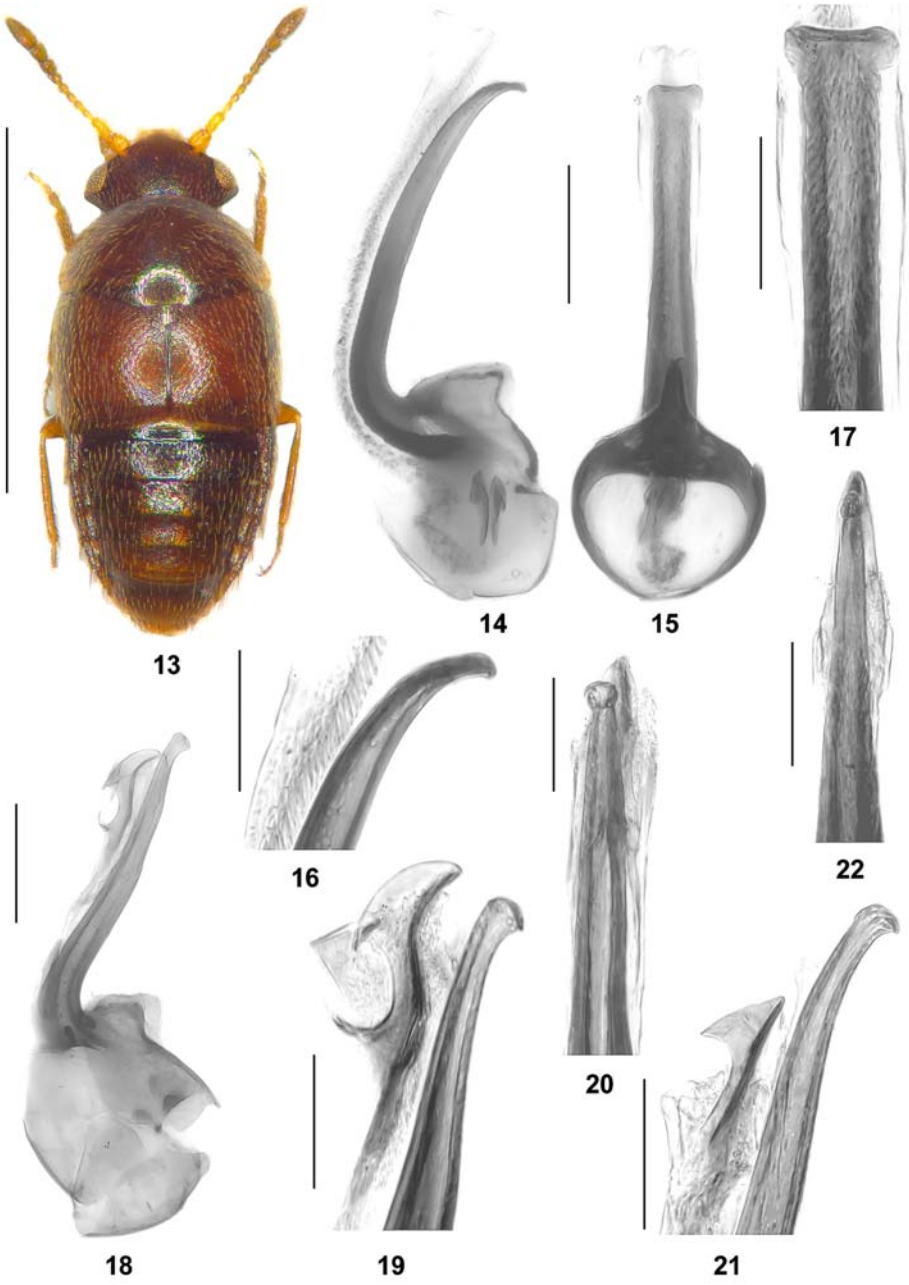
Distribution. According to Schülke & Smetana (2015), *C. seminulum* is widespread in Europe and Northwest Africa. However, it can be assumed that numerous previous records are based on external characters alone. Moreover, Dauphin (2003) erroneously synonymized and confounded this species with *C. hanseni*, so that even more recent records of *C. seminulum* may in fact refer to *C. pulicaria* (see the following section). Nevertheless, based on the revised material, the distribution of *C. seminulum* is enormous and ranges from Portugal (first record) to Georgia (first record).



Figs 1–6. *Cypha squamipennis*. 1 – habitus; 2–3 – median lobe of aedeagus in lateral and in ventral view; 4 – apical portion of median lobe in lateral view; 5–6 – apical portion of median lobe in ventral view. Scale bars: 1: 1.0 mm; 2–6: 0.1 mm.



Figs 7–12. *Cypha seminulum* (**7–9**) and *C. pulicaria* (**10–12**). 7, 10 – antero-median portion of elytra; 8–9, 11–12 – median lobe of aedeagus in lateral and in ventral view. Scale bars: 0.1 mm.



Figs 13–22. *Cypha carinthiaca* (**13–17**), *C. seminulum* (**18–20**; 18: lectotype), and *C. pulicaria* (**21–22**). 13 – habitus; 14–15, 18 – median lobe of aedeagus in lateral and in ventral view; 16, 19, 21 – apical portion of median lobe in lateral view; 17, 20, 22 – apical portion of median lobe in ventral view. Scale bars: 13: 1.0 mm; 14–15, 18: 0.1 mm; 16–17, 19–22: 0.05 mm.

Cypha pulicaria (Erichson, 1839) (Figs 10–12, 21–22)

Hypocyptus pulicarius Erichson, 1839a: 217 f.
Hypocyptus hanseni Palm, 1949: 75 f.; **syn. nov.**
Cypha seminula [sic]: Dauphin (2004), partim.
nec *Cypha pulicaria*: Dauphin (2004).

Type material examined. Syntype ♀ [dissected prior to present study; in poor condition]: "5664 / *pulicarius* Er., Berol. Schüpp. / Type" (MNB).
Additional material examined. Portugal: 1♂, Algarve, N Tavira, Alcaria do Cume, 37°15′N, 7°44′W, 440 m, 12.IV.2002, leg. Meybohm (cAss).
Spain: 1♂, 2♀♀, Castilla y León, Ayllón (SG), 41°23′N, 3°27′W, 1000 m, 21.VIII.2009, leg. González (cAss); 1♂, Andalucía, 35 km NE Vélez Malaga, Sa. di Almijara, 36°58′N, 3°56′W, 1000 m, 25.XII.2003, leg. Assing (cAss).
France: 1♂, 1♀, Provence, Vaucluse, Plateau de Vaucluse, S Sault, 500–700 m, 28.XII.1995, leg. Assing & Stüben (cAss); 1♂ [identified by B. Feldmann], Héches, 42.97954°N, 0.33063°E, 14.IX.2017, flight interception trap, leg. Bouget (cFel).
Germany: Schleswig-Holstein: 3♂♂, Kreis Lauenburg, Kasseburg, 3.XII.2000, leg. Siede (cAss); 3♂♂, Kreis Lauenburg, 1.IV.1990, leg. Meybohm (cMey); 1♂, Kreis Plön, Selenter See, 21.X.1979, leg. Meybohm (cMey); 1♂, Kreis Stormarn, Treuholz/Barnitz, 21.XI.1979, leg. Meybohm (cMey); 1♂, Kreis Stormarn, Forst Beimoor, 30.XII.1990, leg. Meybohm (cMey); 1♂, same data, but 26.IV.1992 (cMey); 1♂, same data, but 28.XI.2006 (cMey); 1♂, same data, but car-net, 10.VII.2016 (cMey); 1♂, Kreis Stormarn, Reinfeld, Fohlenkoppel, 1.V.2013, leg. Meybohm (cMey); 1♂, Kreis Ostholstein, Kasseedorf, car-net, 12.VII.1982, leg. Meybohm (cMey). **Niedersachsen:** 1♀, Nienburg, apple orchard, 17.VII.2001, leg. Sprick (cAss); 1♀, Wilhelmshafen env., Neuenburger Urwald, tree trunk eclector (oak), IX.1992, leg. Menke (cAss); 1♀, same locality, tree trunk eclector (beech), 24.VI.1996 (cAss); 1♀, same locality, dead wood eclector, 7.VIII.1995, leg. Menke (cAss); 1♂, Lüchow-Dannenberg, Gartow, Elbholz, 18.VIII.1985, leg. Meybohm (cMey); 1♂, 1 ex., Lüchow-Dannenberg, Govelin, 27.XII.2011, leg. Meybohm (cMey); 1♂, Lüchow-Dannenberg, Schnackenburg, car-net, 25.VIII.2019, leg. Meybohm (cMey); 1♂ [identified by B. Feldmann], Pevestorf env., flight interception trap (oak), 7–31.VIII.2007, leg. Buse (cFel); 1♂, Winsen/Luhe, Drage, 28.I.1990, leg. Meybohm (cMey); 1♂, Winsen/Luhe, NSG Garstedt, 24.XII.1993, leg. Meybohm (cMey). **Nordrhein-Westfalen:** 2♂♂, 1♀, Mönchengladbach-Gerkerath, swampy oak-alder forest, 22.XI.1998, leg. Wunderle (cWun, cAss) 1♀, S Euskirchen, Kirchheim, 6.III.1984, leg. Wunderle (cWun); 1♂, 1♀, Hambacher Forst, 30.III.1991, leg. Wunderle (cWun); 1♀, Kreis Steinfurt, N Hopsten, Wiechholz, 6.III.1999, leg. Assing (cAss). **Rheinland-Pfalz:** 2♂♂, 1♀, Dielkirchen, meadow, 7.VIII.1989, leg. Heibel (cAss); 1♀, same data, but 4.IX.1989 (cWun). **Baden-Württemberg:** 1♂, Freiburg-Ebringen, am Schönberg, 300 m, oak litter sifted, 15.IX.2008, leg. Wolf (MNB).
Austria: 1♂, 1♀, Salzburg, Niedere Tauern, Tamsweg, 1200 m, car-net, 23.VII.1991, leg. Assing (cAss); 1♂, Steiermark, Bezirg Feldbach, Bad Gleichenberg, STBR. Klausen, 400 m, 1.III.2000, leg. Holzer (cAss).
Italy: 1♀, Abruzzo, Parco Nazionale Pescasseroli (AQ), Funivia env., 1220 m, 2.VIII.2002, leg. Angelini (cAss); 2♀♀, Parco Nazionale d'Abruzzo, N Pescasséroli, 1300 m, 29.XII.1994, leg. Assing (cAss); 1♂, Basilicata, Abetina di Laurenzana (PZ), 1200 m, 31.V.1998, leg. Angelini (cAss); 1♂, Basilicata, Pollino, M. Caramola (PZ), 1350 m, 13.X.2002, leg. Angelini (cAss); 1♀, Basilicata, Pignola, L. Pantano (PZ), 770 m, 19.X.1996, leg. Angelini (cAss); 1♀, Basilicata, Pignola, Riserva WWF L. Pignola (PZ), 700 m, *Salix*, 27.X.1995, leg. Angelini (cAss).

Comment. The original description of *C. pulicaria* is based on an unspecified number of syntypes from "Germania: Berolini a Dom. Schüppel lectus" (Erichson 1839a). The sole syntype in the historical collection in MNB is a female and had been dissected by P. Dauphin. *Cypha hanseni* was described based on a unique male from "der Haderslev-Gegend auf Jütland" (Palm 1949). The illustration of the aedeagus provided in the description leaves no doubt regarding the specific identity of the holotype, so that an examination of the holotype was unnecessary.

While the descriptions of *C. seminulum* and *C. hanseni* are based on males, so that the interpretations of these names are without doubt, the same does not apply to *C. pulicaria*. Based on the size, coloration, and other external characters, it can be concluded that the latter name is synonymous with either *C. seminulum* or *C. hanseni*. Since the *Cypha* fauna of Central Europe is relatively well-studied, the possibility that a third, externally similar, and previously overlooked species is present in the Berlin region can be ruled out. A comparative study of material listed in this paper as *C. seminulum* and *C. pulicaria* revealed that the best (though not always absolutely reliable) external character distinguishing these species is the coloration of the legs (*C. seminulum*: yellowish with usually slightly darker femora; *C. pulicaria*: legs uniformly yellow). The microsculpture of the elytra, particularly in the antero-median portion (near the scutellum) tends to be composed of longer meshes and striae in *C. pulicaria* (Fig. 10) than in *C. seminulum* (Fig. 7), but specimens of *C. pulicaria* with a microsculpture similar to that of *C. seminulum* (similar to the condition in Fig. 7) were observed, too, so that this character is unsuitable for a reliable separation of these species. The elytral microsculpture of the syntype of *C. pulicaria* leans more towards the normal condition found in *C. hanseni* than to that of *C. seminulum*. The original coloration of the legs of the syntype of *C. pulicaria*, which was collected nearly 200 years ago, is no longer assessable. However, according to ERICHSON (1839a), *C. pulicaria* is distinguished from *C. seminulum* by "pedibus dilutioribus". It is, therefore, concluded that the syntype of *C. pulicaria* is conspecific with, and consequently the senior synonym of, *C. hanseni* and not with *C. seminulum*.

Cypha pulicaria sensu DAUPHIN (2004) refers to a species of unknown identity.

Identification. Like *C. seminulum*, *C. pulicaria* is reliably identified based on the distinctive shape of the apical internal structure in lateral view. It is additionally distinguished from the similar *C. seminulum* by uniformly pale-yellow legs (*C. seminulum*: femora mostly at least slightly darker). The elytra of a specimen with microsculpture composed almost exclusively of oblique striae are illustrated in Fig. 10.

Distribution. Owing to the previous taxonomic confusion, the distribution of *C. pulicaria* requires revision. In the course of the present study, males were seen from West and Southwest Europe (Portugal, Spain, France), Central Europe (Germany, Austria), and from Italy southwards to Basilicata.

Cypha carinthiaca (Scheerpeltz, 1985) (Figs 13–17)

Hypocyptus carinthiacus Scheerpeltz, 1958: 54 f.

Type material examined. Holotype ♂ [dissected prior to present study]: "♂ / Karnische Alpen, Zottackkopf, Hölzel det. [sic] / Mit höchster Wahrscheinlichkeit eine Art der Gattung *Hypocyptus*, für die ich den Namen *carinthiacus* vorschlage! / Typus *Hypocyptus carinthiacus* O. Scheerpeltz / ex coll. Scheerpeltz / *Cypha carinthiaca* (Scheerpeltz), det. V. Assing 2020" (NHMW).

Additional material examined. Italy. 1♂, Liguria, Garessio env., Mindino, 1700 m, 3.X.1992, leg. Assing (cAss). Paratypes; 1♂, 1♀, Piemonte (CN), Valle Vareita, Colle di Sampeyre, 2300 m, 7.X.1995, leg. Wunderle (cWun, cAss).

Comment. The original description is based on a unique male holotype sifted "am Zottachkopf in den Karnischen Alpen ... aus '*Azalea*'-Rasen" (Scheerpeltz 1958). The holotype was studied by Dauphin (2004). Since the brief diagnosis and the rough sketch of the aedeagus provided in this paper are insufficient for a reliable identification, a redescription is given below.

Redescription. Body length 1.4–1.5 mm; length of forebody 0.8–0.9 mm; width of pronotum 0.55–0.60 mm. Habitus as in Fig. 13. Coloration: head and pronotum blackish with the lateral and posterior margins of the pronotum reddish-yellow; elytra dark reddish-brown to blackish; abdomen blackish with the apex (posterior margin of tergite VII and segments VIII–X) paler brown; legs brown to dark-brown with the apical tarsomeres yellow; antennae pale-brown to dark-brown with the basal four antennomeres yellow.

Head strongly transverse; punctation very fine and moderately dense; interstices with pronounced microsculpture. Antenna approximately 0.5 mm long, with distinct club formed by antennomeres VIII–X; antennomeres III–VI oblong, X approximately as long as the combined length of VII–IX.

Pronotum strongly transverse; punctation very fine and moderately sparse; pubescence pale and more or less depressed; interstices with shallow transverse microsculpture visible only at high magnification.

Elytra slightly shorter than pronotum; punctation similar to that of pronotum; pubescence pale and more or less depressed; microsculpture more distinct than that of pronotum, predominantly composed of oblique meshes. Meso- and metatarsomeres I very long, longer than the respective terminal tarsomere.

Abdomen with fine and moderately dense punctation; interstices with microsculpture composed of rather large meshes.

♂: protarsomere I moderately dilated and distinctly elongate, much longer than the combined length of protarsomeres II and III, approximately as long as protarsomere IV; median lobe of aedeagus nearly 0.4 mm long and shaped as in Figs 14–17; ventral process apically distinctly curved in lateral view and truncate in ventral view; internal sac with a basal pair of spines and with a long membranous structure.

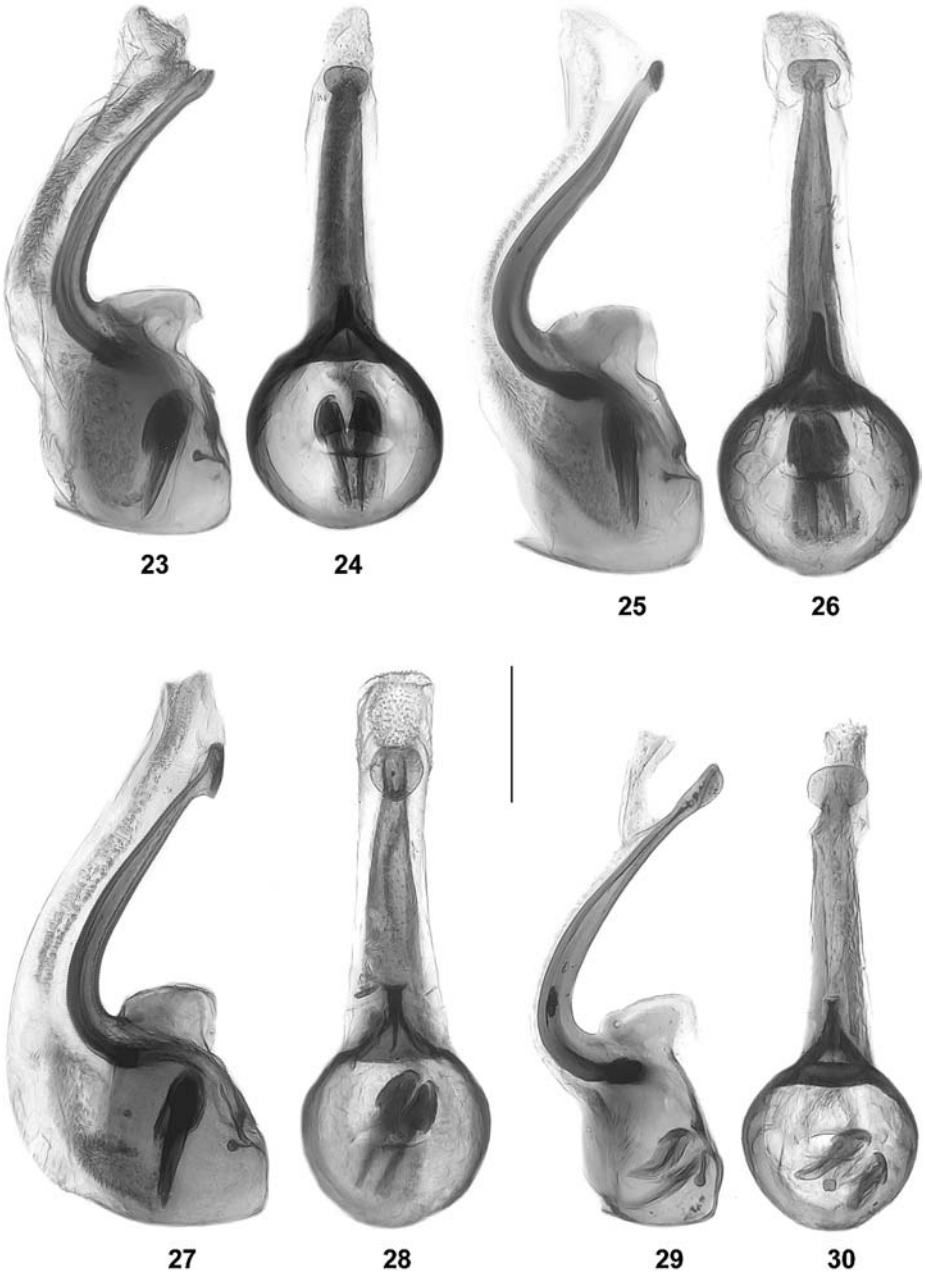
♀: protarsomere I of similar length as in male, but less distinctly dilated.

Comparative notes. This species is reliably distinguished from other *Cypha* species particularly by the distinctive shape of the aedeagus.

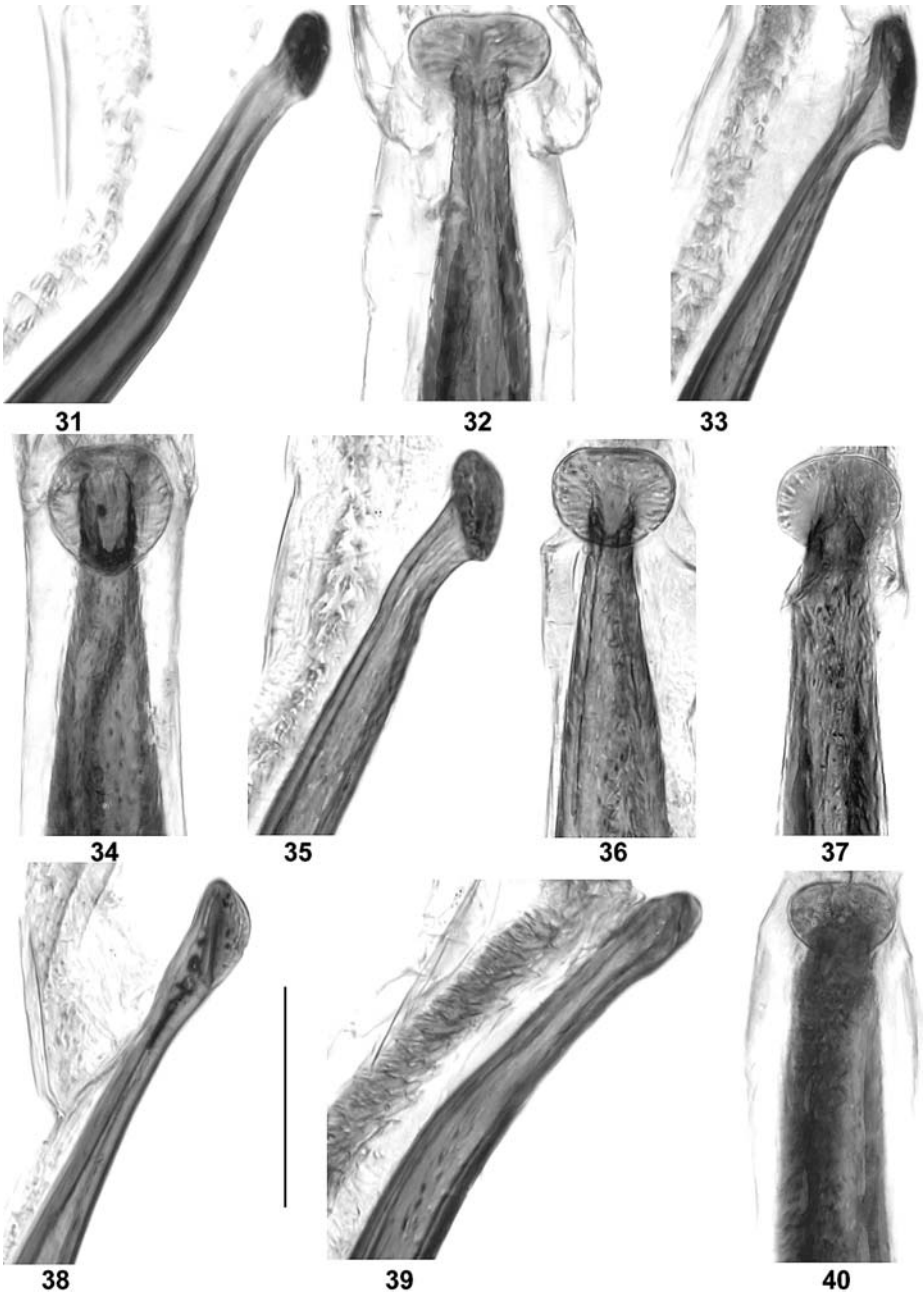
Distribution and natural history. Originally described from Kärnten, Austria, *C. carinthiaca* was subsequently reported also from Steiermark (Austria), Trentino-Alto Adige (Italy), and Slovakia (Dauphin 2004, Schülke & Smetana 2015, Zanetti 2015). The specimens listed above were sifted from litter at altitudes of 1700 and 2300 m.

On the *Cypha spathulata* group

This species group is characterized by an aedeagus with a similarly derived shape of the apex of the ventral process (more or less distinctly separated in lateral view and more or less cordiform in ventral view). Including a new species described below, this group



Figs 23–30. *Cypha spathulata* from Adana (**23–24**), *C. bisinuata* from Abruzzo (**25–26**), *C. graeca* (**27–28**) from Corfu, and *C. lindbergi* from South Spain (**29–30**). Median lobe of aedeagus in lateral and in ventral view. Scale bar: 0.1 mm.



Figs 31–40. *Cypha bisinuata* from Abruzzo (**31–32**), *C. graeca* from Corfu (**33–34**) and Lesbos (**35–36**), *C. lindbergi* from South Spain (**37–38**) and *C. spathulata* from Adana (**39–40**). Apical portion of median lobe of aedeagus in lateral and in ventral view. Scale bar: 0.05 mm.

includes four species with allopatric distributions in the Mediterranean and the Caucasus region, *C. lindbergi* (Palm, 1935) in the Iberian Peninsula, Morocco, and Sicily, *C. bisinuata* sp. nov. in mainland Italy, *C. graeca* Assing, 2004 in Greece, and *C. spathulata* Assing, 2007 in the Greek island Samothraki, Turkey, and the Caucasus region (Map 1).

Cypha spathulata Assing, 2007 (Figs 23–24, 39–40, Map 1)

The original description is based on material from several Turkish provinces (Mersin, Manisa, Kahramanmaraş, Osmaniye, Hatay) and from Spain and Portugal (Assing 2007). Subsequently, this species was reported from other Turkish localities (Assing 2009, 2010, 2011, 2013b), from Armenia, Nagorno-Karabakh (Assing & Schülke 2019), and also from Italy (Assing 2014), but never from the South Balkans, where the closely related and similar *C. graeca* is distributed. This distribution pattern appeared rather doubtful and inspired a revision of the species of *C. spathulata* group.

A re-examination of the *C. spathulata* paratypes eventually revealed that those from the Iberian Peninsula belong to *C. lindbergi*, whereas the non-type specimens reported as *C. spathulata* from Italy (Assing 2014) proved to belong to a distinct, undescribed species (see section on *C. bisinuata*) and those from Greece refer to *C. graeca*. A recent record of *C. graeca* from Samothraki (Assing 2019), by contrast, in fact refers to *C. spathulata*. The currently known distribution is illustrated in Map 1.

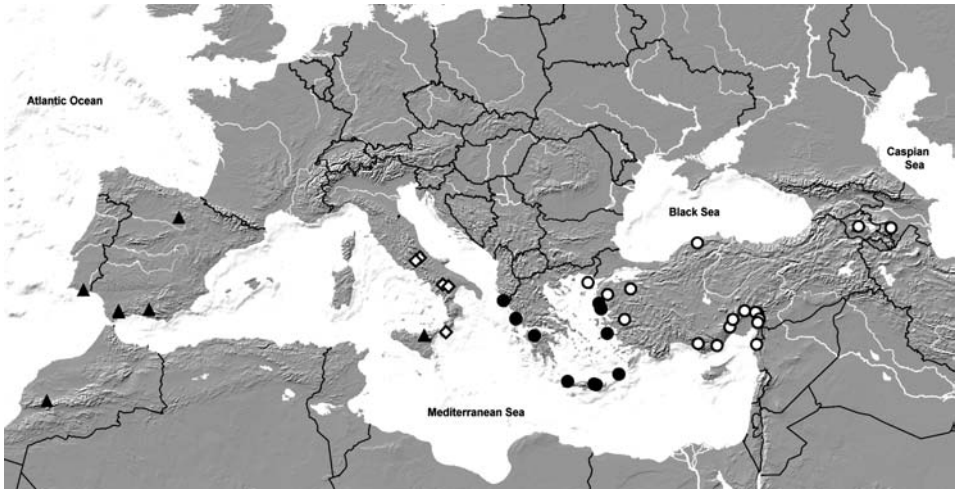
The aedeagus of *C. spathulata* (Figs 23–24, 39–40) is most similar to that of *C. lindbergi*, but distinguished by an apex of slightly different shape (lateral view) and by the crista apicalis being closer to the base of the ventral process.

Cypha lindbergi (Palm, 1935) (Figs 28–30, 37–38, Map 1)

New material examined. Spain: 1♀, Castilly y León, 60 km SE Burgos, 8 km E Neila, 42°05′N, 2°58′W, 1580 m, 16.X.2003, leg. Assing (cAss). **Italy: Sicily:** 1♂, Monti Nebrodi, E Portela Femmina Morta, 37°55′N, 14°39′E, 1560 m, 2.IV.2001, leg. Schülke (cAss); 1 ex., Monti Nebrodi, N Pizzo Muto, 37°56′N, 14°39′E, 1290 m, 12.IV.2001, leg. Schülke (MNB). For additional material see the paratypes of *C. spathulata* from Spain and Portugal.

The original description is based on a unique male holotype from "Amismiz" in the Haut Atlas range in Morocco (Palm 1935). The species was subsequently reported also from Portugal, Italy, and Corsica (Schülke & Smetana 2015). Previous records from Italy and probably also those from Corsica require revision; they may refer to *C. bisinuata*. A revision of the paratypes of *C. spathulata* revealed that those from Spain belong to *C. lindbergi*. Thus, the presently confirmed distribution includes the Iberian Peninsula (Portugal, Spain), Morocco, and Sicily (Map 1). The aedeagus of the male from Sicily is slightly larger (0.4 mm) than that of material from the Iberian Peninsula, but otherwise no convincing evidence was found suggesting that it should belong to a different species.

For illustrations of the aedeagus of Iberian specimens see Figs 28–30, 37–38.



Map 1. Distributions of the species of the *C. spathulata* group in the Mediterranean and Caucasus regions: *C. lindbergi* (black triangles); *C. bisinuata* (white diamonds); *C. graeca* (black circles); *C. spathulata* (white circles).

Cypha graeca Assing, 2004 (Figs 27–28, 33–34)

New material examined. Greece: 1♀, Pelopónnisos, Erimanthos, 3.7 km N Plaka, 900 m, 5.V.1999, leg. Wolf (MNB).

This species has been recorded from from several Greek islands (Crete, Corfu, Lefkas, Karpathos, Lesbos, Samos), partly as *C. spathulata* (Assing 2013a, 2016a, b, 2017, Assing et al. 2018). The recent record from Samothraki (Assing 2019) is based on a misidentification and refers to *C. spathulata*. The currently known distribution is illustrated in Map 1.

Among the species of the *C. spathulata* group, *C. graeca* is characterized particularly by the distinctive shape of the apex of the ventral process (Figs 27–28, 33–34).

Cypha bisinuata sp. nov. (Figs 25–26, 31–32, Map 1)

Type material. Holotype ♂: "CALABRIA Asprom., San Luca (RC), 200 m, 28.IV.2002, prato, leg. F. Angelini / Holotypus ♂ *Cypha bisinuata* sp. n., det. V. Assing 2019" (cAss). Paratypes: 1♂: "BASILICATA Pignola, Ris. WWF L. Pignola (PZ), 700 m, 27.X.1995, salix, leg. F. Angelini" (cAss); 1♂: "ABRUZZO Palena (CH), Valico Forchetta, 1270 m, 1.VIII.2002, fagus, leg. Angelini" (cAss); 1♂, 1♀: "Italien, Lazio, 50 km n Monte Cassino, Passo di Forca D'Acero, I. Wolf leg., 15.05.1998" (MNB); 1♀: "Italien, Basilicata, Region Potenza, Com. Accettura, westl. San Mauro Forte, 600–780 m, 22.X.2000, I. Wolf" (MNB).

Etymology. The specific epithet (Latin, adjective) alludes to the bisinuate ventral process of the aedeagus (lateral view).

Description. External characters as in *C. graeca* and *C. spathulata*; distinguished only by the shape of the aedeagus.

♂: median lobe of aedeagus nearly 0.4 mm long and shaped as in Figs 25–26, 31–32; ventral process slender and weakly bisinuate in lateral view, apex transverse in ventral view.

Distribution and natural history. The known distribution is confined to five localities in South Italy. The specimens were collected at altitudes of 200–1270 m, three of them in a meadow, in *Salix* litter, and in a beech forest.

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