ACTA ENTOMOLOGICA
MUSEI NATIONALIS PRAGAE
ISSN 1804-6487 (online) – 0374-1036 (print)

2024
64(1): 113–119
doi: 10.37520/aemnp.2024.009
www.aemnp.eu

RESEARCH PAPER

A new species of *Acantholyda* (Hymenoptera: Pamphiliidae) from Lebanon, associated with *Cedrus libani* (Pinaceae)

Andrew LISTON[1)] & Thierry NOBLECOURT[2)]

[1)] Senckenberg Deutsches Entomologisches Institut, Eberswalder Str. 90, 15374 Müncheberg, Germany; e-mail: aliston@senckenberg.de

[2)] Réseau Entomologie de l'Office national des Forêts, 14 rue de la Garenne, 11190 Antugnac, France; e-mail: symphyte@orange.fr

Accepted:
8th May 2024

Published online:
14th June 2024

Abstract. *Acantholyda nemeri* sp. nov. (Hymenoptera: Pamphiliidae) is described from adults of both sexes from Lebanon. Its host plant is probably *Cedrus libani*, the cedar of Lebanon (Pinaceae). The new species shows a combination of adult characters that makes placing it in one of the two widely-recognised subgenera of *Acantholyda* problematic. *Acantholyda nemeri* is only the fourth sawfly species associated with *Cedrus* as a larval host and, together with *Cephalcia tannourinensis* Chevin, 2002 (Pamphiliidae), the second from *C. libani.* A key to adults of *Acantholyda* Costa, 1894 species of the Western Palaearctic is provided.

Key words. Hymenoptera, Symphyta, Pamphiliidae, sawfly, key, new species, taxonomy, cedar of Lebanon, Western Palaearctic Region

Zoobank: http://zoobank.org/urn:lsid:zoobank.org:pub:3A48A756-7376-418A-A9C7-EF7CC4DE936F

Introduction

The sawfly genus *Acantholyda* Costa, 1894 is mainly distributed in the Holarctic, with some species occurring in the Oriental Region and in the northern parts of the Neotropics (Taeger et al. 2010). Of the 63 extant species described, 33 occur in the Palaearctic, nine of which were known from the Western Palaearctic (Taeger et al. 2010; Wu et al. 2014, 2016; Liu et al. 2022). The eight European species were keyed by Achterberg & Aartsen (1986). The larval hosts of all species are conifers of the family Pinaceae. In Europe, the known hosts for six species are *Pinus*, with one species on *Larix* (Pérez Fortea et al. 1997, Lacourt 2020). In the Eastern Palaearctic and Nearctic, some *Acantholyda* also feed on *Picea*, *Abies*, *Pseudotsuga* and *Tsuga* (Middlekauff 1958, Shinohara 2000). A few species, such as *A. posticalis* (Matsumura, 1912) in Europe, cause considerable damage to their hosts when they reach "outbreak" population levels.

In this paper we describe a new *Acantholyda* species from Lebanon associated with cedar of Lebanon and provide a key to Western Palaearctic species.

Material and methods

Morphological terminology follows Viitasaari (2002a), with some special terms for the sutures and crests on the head of Pamphiliidae after Shinohara (2002). The abbreviation SDEI is used for the collection of the Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany. HT stands for the holotype. The codes prefixed by DEI-GISHym are unique specimen identifiers. Pinned specimens carry a separate label with this code. Illustrations are from stacks of images taken at successively lower planes of focus with a Leica DFC450 camera through Leica Z6 APO and Leica M205C microscopes, and combined to single images using the software Helicon Focus 8.1.1.

Results

Acantholyda nemeri sp. nov.

(Figs 1–3)

Type material. Holotype: ♀ (DEI-GISHym81501), Lebanon: Tannourine Cedar Reserve (34.21°N 35.93°E), 31.05.2016, Steffan Kyrk leg. Deposited in SDEI. Paratypes: Lebanon, Tannourine Cedar Reserve: 1 ♀ (DEI-GISHym81502), 03.06.2016, S. Kyrk leg.; 1 ♀ (DEI-GISHym81503), 03.06.2016, Nabil Nemer leg.; 1 ♂ (DEI-GISHym81504), 31.05.2016, N. Nemer leg. All deposited in SDEI.

Description. ***Female*** (Figs 1–2). *Colour.* Head largely yellow, indistinctly brown-tinged on the median postocellar area, part of the vertex, and the outer orbits (Figs 1E, 2B–C). A black patch surrounds the ocelli (Figs 1A, E); a black fleck at top of eye (Fig. 2C); inner occiput extensively black (Fig. 1B). Tips of mandibles brownish

(Fig. 1E). Antenna black; tip of scape, more or less inner side of pedicel and base of antennomere 3 pale (Fig. 1D). Thorax black, without metallic lustre (Fig. 2D). Pale are pronotum, upper parts of propleura, tegulae and more or less interior of median mesoscutal lobe (Figs 2A, D). Legs yellowish (Figs 1A, B; 2A). Black are coxae, trochanters, more or less trochantelli (Fig. 1B), bases and larger part of upper surface of femora, extreme tip of metatibia [HT and DEI-GISHym81503], sometimes continued as narrow streak along inner face [DEI-GISHym81502], and more or less the tarsi. Wing membranes hyaline, apices darkened (Fig. 1A). Veins including fore wing stigma dark, except for pale Sc and R (Fig. 1A). Abdominal terga largely black, lateral margins pale (Figs 1A, C). Terga 4 and 5 mainly black (Fig. 1C; DEI-GISHym81502) to extensively pale (Fig. 1A) [HT and DEI-GISHym81503]. Sterna from extensively dark to mostly pale (Fig. 1B).

Structure and vestiture. Head. Without occipital carina (Fig. 2C). Punctation irregular and shallow, including clypeus; interspaces smooth and shiny (Figs 1E; 2B, C). Punctation densest around the ocelli and on the upper paraantennal fields; lowest part of paraantennal fields almost impunctate (Fig. 1E). Pubescence on upper head (above level of antennal sockets) sparse, mostly slightly shorter than width of anterior ocellus (Fig. 2B, C). Antenna (Fig. 1D): 29–32 antennomeres (HT 32); ratios of lengths of antennomeres 1–5 as 10.0 : 3.2 : 10.2 : 3.7 : 3.5.

Thorax. Setae on mesoscutum no longer than width of anterior ocellus, on mesoscutellum slightly longer. A median, longitudinal strip of punctures on lateral mesoscutal lobes; median mesoscutal lobe largely impunctate except for a few indistinct punctures on posterior edge; mesoscutellum in anterior half nearly impunctate, posterior half densely punctate (Fig. 2D). Mesepisternum shallowly punctate, with shiny interspaces; setae up to 3.5× as long as the width of anterior ocellus. Mesepimeron impunctate but finely sculptured, without setae. Protibia with 1 pre-apical spur. Fore wing cell C glabrous; cell Sc apically with very few, minute setae. Hind wing 2A without stub (Fig. 1A).

Abdomen. Terga 1–3 slightly sculptured, especially laterally, but shiny; following terga nearly without sculpture (Fig. 2E).

Body length: 9.5–10.0 [HT 10.0] mm.

Male (Fig 3). Characters as for female except for: Head (Figs 3C–E) largely black. Pale (yellow-white) are most of clypeus apart from black upper lateral margins, mouthparts (but basal and apical palpomeres partly dark; mandibles brown-tipped), narrow margins of inner and outer orbit to about 0.75× height of eye, a small spot at the top of the eye. Pubescence partly long: on upper head up to 2.5× width of anterior ocellus (Fig. 3D). 30 antennomeres. Ratios of lengths of antennomeres 1–5 as 10.0 : 3.3 : 10.1 : 4.3 : 4.0. Thorax (Figs 3A, B) entirely black except for small part of pronotum next to spiracle. Pro- and mesofemur black except for tips; metafemur extensively black dorsally, pale ventrally. All tibiae black-streaked along inner side (more strongly than in female); streak widening towards apex. Mesoscutum and mesoscutellum more extensively and strongly punctate than female; densely setose, longest setae 2.5× as long as width of anterior ocellus. Abdominal terga black; lateral margins pale (Fig. 3A). Sterna yellow with small median dark fleck on sterna 1–6 (Fig. 3B). Subgenital plate apically truncate (Fig. 3F).

Body length: 8 mm.

Differential diagnosis. The main distinguishing character between *Acantholyda* and the closely related genus *Cephalcia* Panzer, 1802 is the presence of one or two pre-apical spines on the protibia of the former and the absence of pre-apical spines in the latter. *Cephalcia tannourinensis* Chevin, 2002, which also occurs in the cedar forests of Lebanon, and was previously the only pamphiliid species recorded in the country, is readily distinguished from *A. nemeri* sp. nov. by its completely black head (in both sexes). As far as we have determined, the combination of characters consisting of 1 pre-apical spur on protibia, missing occipital carina, and hind wing 2A without stub is unique among the described *Acantholyda* species.

Etymology. The species name honours Nabil Nemer, entomologist and curator of the Tannourine Cedar Nature Reserve, who collected part of the type series.

Host plant. All the specimens were collected either "on sight" from branches of *Cedrus libani* A. Rich., or from herbaceous vegetation growing under *C. libani*. As no other tree species of the Pinaceae occur at the type locality (N. Nemer, personal communication), it is very likely that *C. libani* is the larval host.

Distribution. Lebanon (this paper).

Key to Western Palaearctic species of *Acantholyda* Costa, 1894

1 Protibia with 1 pre-apical spur. At least dorsal face of antennal scape black-marked [except for female of *A. hieroglyphica* (Christ, 1791)]. Occipital carina present or absent. 2
– Protibia with 2 pre-apical spurs. Antennal scape entirely pale. Occipital carina absent. [Fore wing stigma entirely dark. Wing membranes hyaline. Black body parts without bluish lustre. Abdominal terga black, at most laterally pale]. ... ***A. serbica*** Vasić, 1962 [Balkans, Romania, southern Italy, and Spain. Host: *Pinus nigra*]
2 (1) Occipital carina absent. Dark body parts often with bluish lustre. Fore wing stigma entirely dark. Female: upper head extensively yellow to red except at most for a contiguous black patch extending over ocellar and postocellar areas. …..... 3
– Occipital carina present. Dark body parts rarely [only *A. teunisseni* Achterberg & Aartsen, 1986] with bluish lustre. Fore wing stigma entirely dark or apically pale. Female: upper head entirely black, or black with whitish markings on vertex and along posterior orbits and postocellar sutures. 10
3 (2) Female. 4
– Male. 7
4 (3) Pronotum black; tegulae black. Hind legs completely black. Apical stub of 2A in hind wing present. 5
– Pronotum extensively pale; tegulae largely pale. Hind

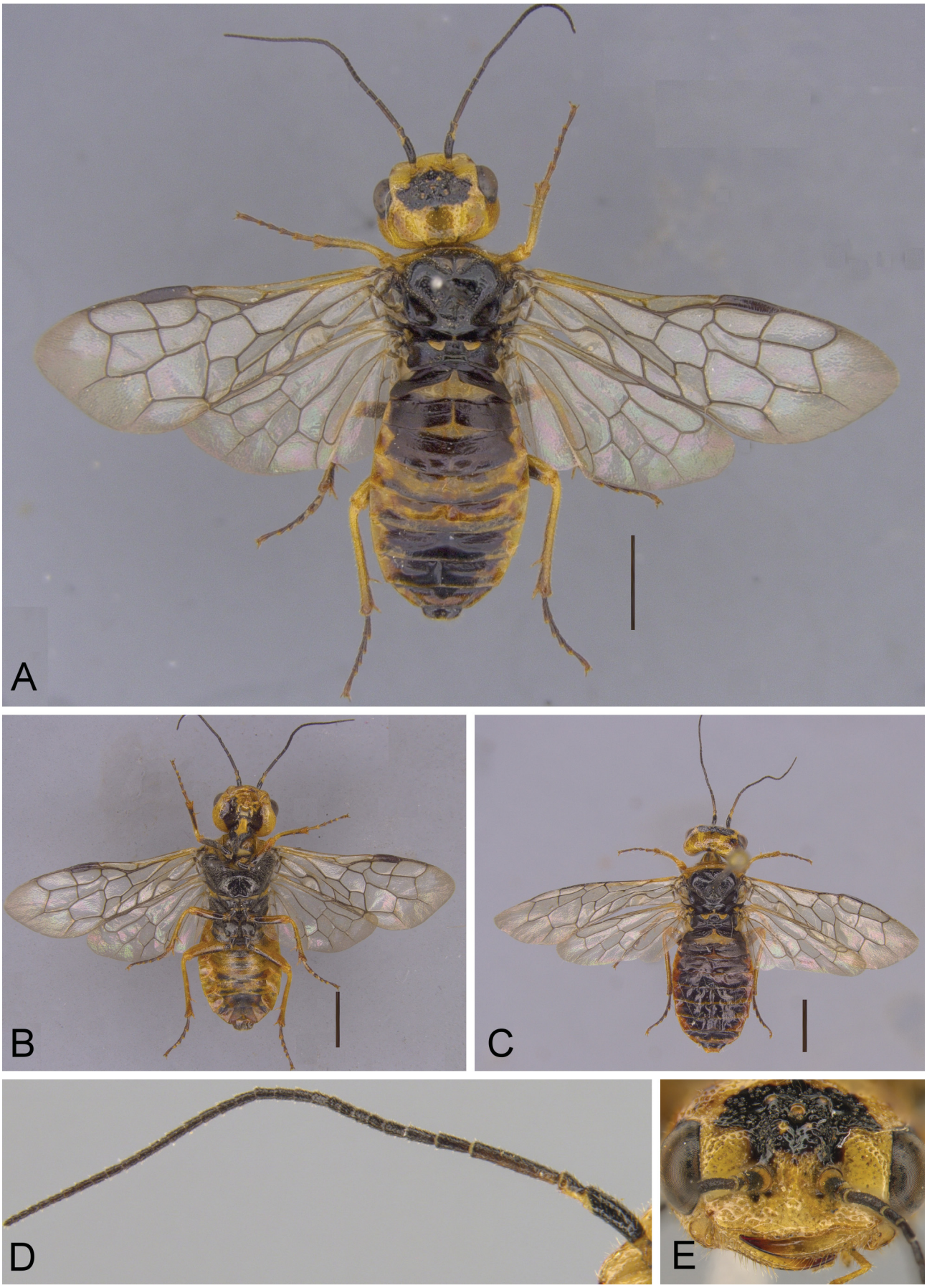

Fig. 1. *Acantholyda nemeri* sp. nov. ♀. A, B, D, E – holotype; C – paratype DEI-GISHym81502. A, C – dorsal view; B – ventral view; D – antenna; E – face. Scale bars = 2 mm.

tibia mainly pale, hind femur ventrally extensively pale. Apical stub of 2A in hind wing missing. .... ***A. nemeri* sp. nov.** [Lebanon. Host: ? *Cedrus libani*]

5 (4) Postocellar area mainly pale. 6
– Postocellar area completely black [wings hyaline apart from slightly darkened margins of fore wings]. ..... ***A. flaviceps*** (Retzius, 1783) [Central and northern Europe, east to Krasnoyarsk Territory in Siberia. Hosts: *Pinus* spp.]

6 (5) Entire wing membranes strongly smoky. Abdomen entirely black. Flagellomeres entirely black. .... ***A. erythrocephala*** (Linnaeus, 1758) [Widespread in Europe from the Balkans, Italy and Spain north into northern Fennoscandia, also in the British mainland; east to Korea; introduced to North America. Hosts: *Pinus* spp.]
– Wings hyaline apart from slightly darkened apical margins of fore wings. Tergum 1 and apex of abdomen black with some middle terga and asterna completely red. Flagellomeres partly pale. .... ***A. pumilionis*** (Giraud, 1861) [European Alps and Carpathians, mainly around the tree-line. Hosts: *Pinus mugo*, *P. cembra*]

7 (3) Abdominal terga largely black, at most laterally pale. Flagellomeres entirely black. 8
– Base and apex of abdomen black with some middle terga and sterna completely red. Flagellomeres partly pale. ..... ***A. pumilionis*** (Giraud, 1861)

8 (7) Abdominal terga completely black; sterna black at most with small pale median flecks. Hind legs completely black. 9
– Abdominal terga laterally pale; sterna pale with small dark median flecks. Hind tibiae and undersides of femora extensively pale. ..... ***A. nemeri* sp. nov.**

9 (8) Hairs on scape less than 0.25× as long as width of scape. Fore wing membrane strongly smoky at base, including entire cells C and Sc, becoming clearer towards apex. ..... ***A. erythrocephala*** (Linnaeus, 1758)
– Hairs on scape mostly longer than width of scape. Forewing membrane mostly hyaline except for smoky basal 0.15–0.20 and slightly darkened tips. .... ***A. flaviceps*** (Retzius, 1783)

10 (2) Fore wing veins extensively dark (at least Sc+R and 2A+3A); wing membranes from hyaline to more or less smoky. Abdominal segments 2 and 3 entirely orange red or more or less dark. Female: upper head with pale (whitish) markings on vertex and orbits. 11
– Fore wing veins entirely yellow, apart from base of stigma, 1r-rs and small contiguous sections of Rs; wing membranes yellow apart from small dark patch below stigma and slightly darkened wing tips. At least abdominal segments 2 and 3 entirely orange-red. Female: upper head entirely black. .... ***A. hieroglyphica*** (Christ, 1791) [Widespread in Europe from the Balkans, Italy and Spain north into northern Fennoscandia; east to eastern Siberia (Irkutsk region). Hosts: *Pinus* spp.]

11 (10) Abdomen red; black are only tergum 1 and more or less the tip of abdomen from segment 7. Fore wing stigma black. ..... ***A. fumata*** (Enslin, 1910) [Male unknown. Only known from the holotype: Turkey, Taurus Mts. Host: unknown]
– All abdominal terga mainly black, laterally more or less brown; sterna mainly black, with some brown markings. Fore wing stigma black or basally black and apically pale. 12

12 (11) Hairs on vertex of head long: equal to or longer than width of antennal socket. Vertex densely punctate; interspaces mostly about as wide as punctures. Fore wing stigma nearly entirely black; only extreme apex brownish..... ***A. teunisseni*** Achterberg & Aartsen, 1986 [Male unknown. Spain and Portugal. Host: unknown]
– Hairs on vertex of head short: no longer than 0.6× width of antennal socket. Vertex moderately punctate; interspaces mostly wider than punctures. At least apical half of fore wing stigma yellowish. 13

13 (12) Fore wing without dark band posterior of stigma; hind wing entirely hyaline. 31–36 antennomres. Female: Mesoscutellum usually pale-marked. Body length: ♀ 11.5–15.0mm, ♂ 9.0–12.0mm. .... ***A. posticalis*** (Matsumura, 1912) [Widespread in Europe from Greece, southern Italy and Iberia northwards to northern Fennoscandia, and also the British mainland; eastwards through Siberia to Japan. Represented in Europe, Siberia and China by subspecies *A. p. pinivora* Enslin, 1918, in Korea by *A. p. koreana* Shinohara, 2000 and in Japan by the nominotypical subspecies (see Shinohara 2000). Hosts: *Pinus* spp.]
– Fore wing with distinct dark band posterior of stigma; apical half of hind wing dark. 21–29 antennomeres. Female: Mesoscutellum usually entirely black. Body length: ♀ 9.0–12.0 mm, ♂ 8.5–9.0 mm. .... ***A. laricis*** (Giraud, 1861) [Central Europe south to the northern Balkans and northern Italy; east through Siberia to northern China and Japan. Hosts: *Larix* spp.]

Discussion

Several authors have followed Konow (1897) and divided *Acantholyda* species into two subgenera, based principally on the presence (*Itycorsia* Konow, 1897) or absence (*Acantholyda* s. str.) of an occipital carina. Middlekauff (1958) proposed the presence in *Acantholyda* and absence in *Itycorsia* of the apical stub 2A of the hind wing as an additional distinguishing character. But as discussed by Shinohara (2001) for the Japanese species, these two characters do not coincide in all species. He found that while the single Japanese species without a carina (and therefore placed in *Acantholyda* s. str.) always has a 2A apical stub, four of the species with a carina (and which he therefore placed in *Itycorsia*) also possess this stub. *Acantholyda nemeri* sp. nov. is noteworthy in that it lacks both the carina and the 2A apical stub. The Western Palaearctic *Acantholyda* placed in *Acantholyda* s. str. (e.g.

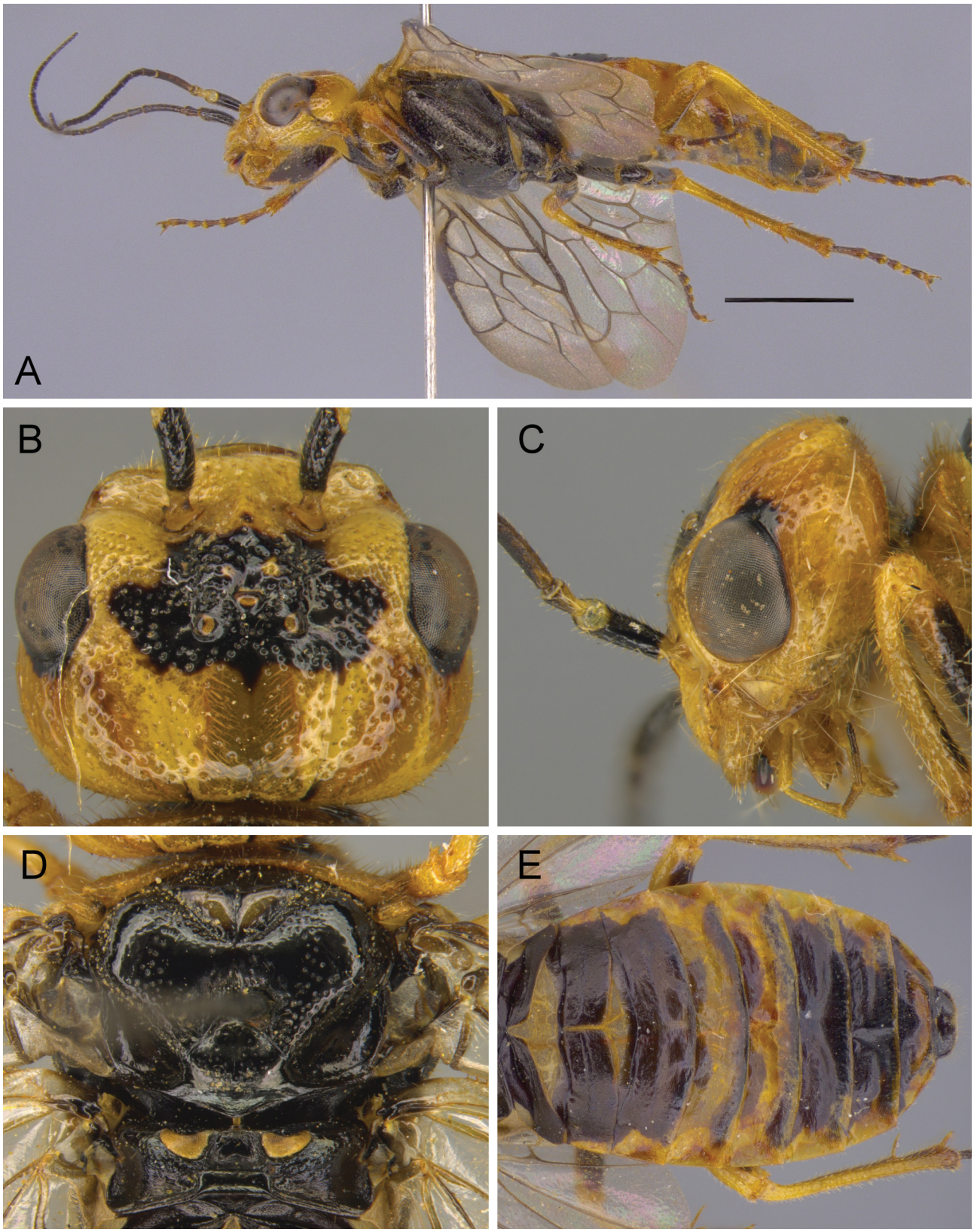

Fig. 2. *Acantholyda nemeri* sp. nov. ♀. A, B, D, E – holotype; C – paratype DEI-GISHym81503. A – lateral view; B, C – head dorsal and lateral; D – thorax dorsal; E – abdomen dorsal. Scale bar = 2 mm.

in Taeger et al. 2010) all possess this stub. Although the presence or absence of the occipital carina is useful for the identification of species, its phylogenetic significance remains doubtful. Sequence data for nuclear genes, which would probably help to clarify the phylogeny of the genus, are currently not available for a sufficient number of species. Analysis of CO1 barcoding sequences currently available for 14 species which have been identified to species level (data from BOLD Systems, retrieved 20.02.2024), does separate them into two main groups, with a deep dichotomy. However, although the larger barcoding clusters are apparently mainly congruent with the

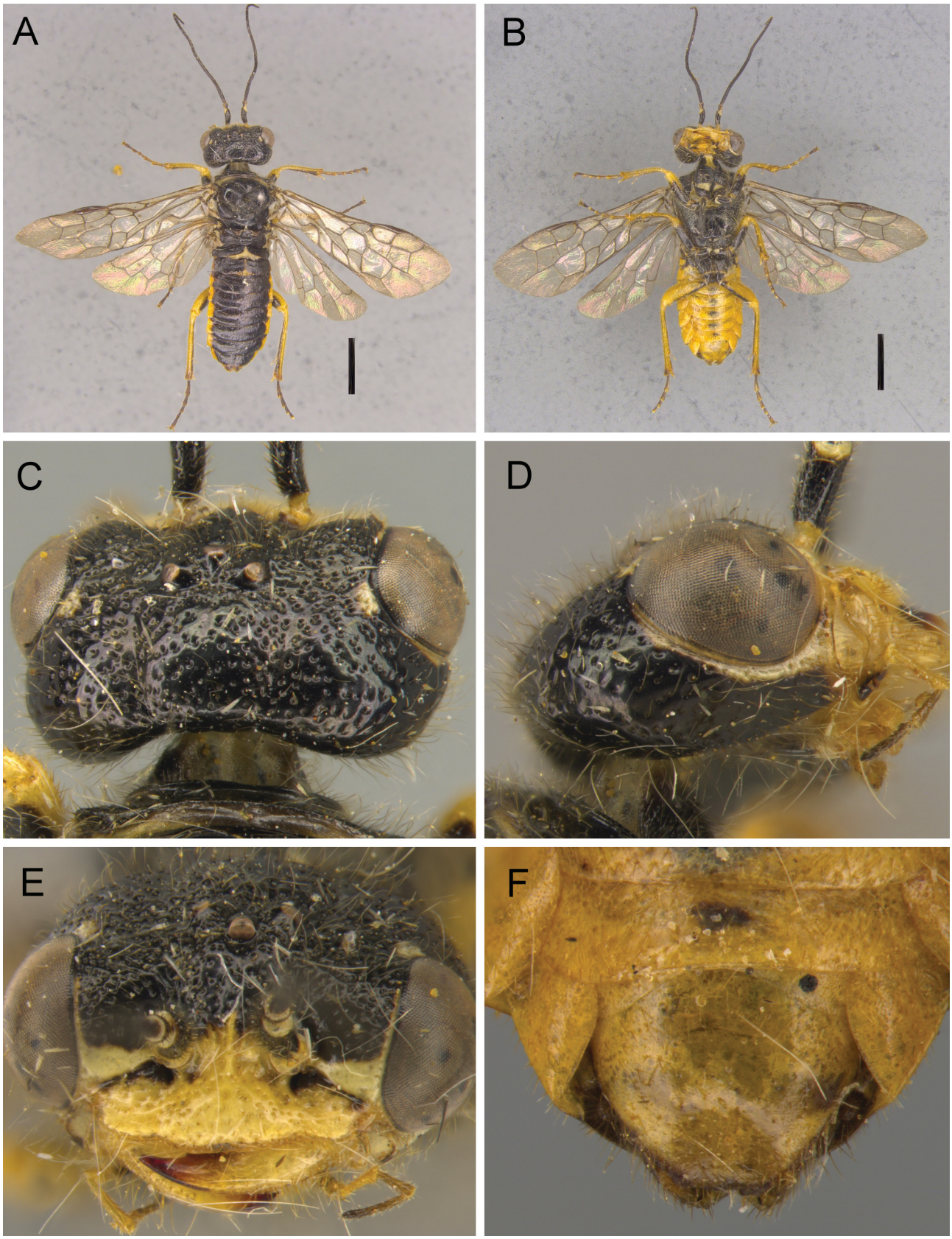

Fig. 3. *Acantholyda nemeri* sp. nov. ♂ paratype DEI-GISHym81504. A – dorsal view; B – ventral view; C, D, E – head dorsal, lateral and frontal; F – subgenital plate ventral. Scale bars = 2 mm.

two (morphological) subgenera, *A. hieroglyphica* (the type species of *Itycorsia*) is very distant from other "*Itycorsia*". The barcoding position of *A. serbica,* which lacks both a carina and an apical stub of 2A, is also ambivalent. Due to these ambiguities, we refrain from placing *Acantholyda nemeri* sp. nov. in one of the putative subgenera.

Significantly fewer species of Pamphiliidae are recorded from areas of Mediterranean climate than in more humid, northern regions. For example, only six Pamphiliidae have been recorded from Turkey (Benson 1968), only one from Lebanon (Chevin 2002), and none from Israel (Smith 1982), whereas 49 species are known from Germany (Liston et al. 2012). These numbers probably reflect a real difference, but the apparent poverty of the Mediterranean pamphiliid fauna is certainly accentuated by the lower intensity of collecting and sampling.

The single pamphiliid species previously recorded in Lebanon is *Cephalcia tannourinensis*, which has the same type locality as *Acantholyda nemeri* sp. nov. The Tannourine Forest comprises the largest surviving stand of Lebanese cedars (*Cedrus libani*) in Lebanon. *Cephalcia tannourinensis* first attracted attention when it suddenly reached an "outbreak" level and caused severe damage to these cedars (Nemer et al. 2007). Although the adults of *C. tannourinensis* are easily distinguishable from *A. nemeri*, this may not apply to their larvae. Viitasaari (2002b) suggested a single morphological character, visible only under the microscope, that could distinguish the larvae of some European *Acantholyda* from those of *Cephalcia*. Therefore, it is possible that *A. nemeri* has contributed to the severe defoliation of *C. libani* which has occurred in the Tannourine Cedar Reserve, but that this damage has so far only been attributed to *C. tannourinensis*.

Finally, we note that both *Cephalcia tannourinensis* and *Acantholyda nemeri* are currently recorded, worldwide, only in Tannourine Cedar Reserve. Efforts should be made to find out whether these species occur in other areas where *Cedrus libani* is native, particularly in its main distribution area in south-east Turkey. It is also possible that these pamphiliids, or related species, occur on *Cedrus atlantica*, which is native to North Africa. Currently, only two other sawfly species, both monophages, are known to utilise *Cedrus* as a larval host, namely the rarely collected North African *Prionomeion gaullei* (Konow, 1906) and *P. maghrebense* Hara, 2016 of the family Diprionidae (Hara 2016).

Acknowledgements

We are indebted to Nabil Nemer (Holy Spirit University of Kaslik, Lebanon) for additional information on the circumstances of the capture of the type specimens of the new species, and to Christian Cocquempot (Plougonven, France) for making the specimens available to us for study. Ladislav Roller (Slovak Academy of Sciences, Bratislava), Akihiko Shinohara (National Museum of Nature and Science, Tsukuba, Japan) and the editor Petr Kment (National Museum of the Czech Republic, Prague) made valuable suggestions, which improved the quality of the manuscript.

References

ACHTERBERG C. van & AARTSEN B. van 1986: The European Pamphiliidae (Hymenoptera: Symphyta), with special reference to the Netherlands. *Zoologische Verhandelingen* **234**: 1–98.

BENSON R. B. 1968: Hymenoptera from Turkey, Symphyta. *Bulletin of the British Museum (Natural History), Entomology Series* **22 (4)**: 111–207.

CHEVIN H. 2002: *Cephalcia tannourinensis* n. sp., nouveau ravageur du Cèdre du Liban (Hyménoptères Pamphiliidae). *Entomologiste* (Paris) **58 (5–6)**: 241–242.

HARA H. 2016: The North African sawfly genus *Prionomeion* (Hymenoptera, Diprionidae), with a key to the Palaearctic genera of the subfamily Diprioninae. *Zootaxa* **4127 (3)**: 537–552.

KONOW F. W. 1897: Systematische und kritische Bearbeitung der Blattwespen-Tribus Lydini. *Annalen des Kaiserlich-Königlichen Naturhistorischen Hofmuseums* **12 (1)**: 1–32.

LACOURT J. 2020: *Sawflies of Europe. Hymenoptera of Europe 2*. N. A. P. Editions, Verrières-le-Buisson, 876 pp. [Translated from the original French by Anna Hallewell].

LISTON A. D., JANSEN E., BLANK S. M., KRAUS M. & TAEGER A. 2012: Rote Liste und Gesamtartenliste der Pflanzenwespen (Hymenoptera: Symphyta) Deutschlands. Stand März 2011. *Naturschutz und Biologische Vielfalt* **70 (3)**: 489–556.

LIU M.-M., LI Z.-J. & WEI M.-C. 2022: Descriptions of four new species of Pamphiliidae (Hymenoptera) from Zhejiang, China. *Entomotaxonomia* **44 (3)**: 203–214.

MIDDLEKAUFF W. W. 1958: The North American sawflies of the genera *Acantholyda*, *Cephalcia* and *Neurotoma* (Hymenoptera, Pamphiliidae). *University of California Publications in Entomology* **14 (2)**: 51–174.

NEMER N., KAWAR N. S., KFOURY L. & FREROT B. 2007: Evidence of sexual attraction by pheromone in the cedar web-spinning sawfly. *Canadian Entomologist* **139**: 713–721.

PÉREZ FORTEA V., HERNÁNDEZ ALONSO R. & MARTÍN BERNAL E. 1997: Nota sobre *Acantholyda serbica* Vasic en *Pinus nigra salzmannii* (Dunal) Franco, en Teruel. *Boletín de Sanidad Vegetal Plagas* **23**: 133–137.

SHINOHARA A. 2000: Pine-feeding Webspinning Sawflies of the *Acantholyda posticalis* Group (Hymenoptera, Pamphiliidae). *Bulletin of the National Science Museum, Series A, Zoology* **26 (2)**: 57–98.

SHINOHARA A. 2001: Conifer-feeding Webspinning Sawflies of the Genus *Acantholyda* (Hymenoptera, Pamphiliidae) of Japan. *Species Diversity* **6**: 23–63.

SHINOHARA A. 2002: Systematics of the leaf-rolling or web-spinning sawfly subfamily Pamphiliinae (Hymenoptera): a preliminary overview. Pp. 359–438. In: VIITASAARI M. (ed.): *Sawflies (Hymenoptera, Symphyta) I. A review of the suborder, the Western Palaearctic taxa of Xyeloidea and Pamphilioidea*. Tremex, Helsinki, 516 pp.

SMITH D. R. 1982: List of the Symphyta (Hymenoptera) of Israel, with description of four new species. *Israel Journal of Entomology* **16**: 1–25.

TAEGER A., BLANK S. M. & LISTON A. D. 2010: World Catalog of Symphyta (Hymenoptera). *Zootaxa* **2580**: 1–1064.

VIITASAARI M. 2002a: The Suborder Symphyta of the Hymenoptera. Pp. 11–174. In: VIITASAARI M. (ed.): *Sawflies (Hymenoptera, Symphyta) I. A review of the suborder, the Western Palaearctic taxa of Xyeloidea and Pamphilioidea*. Tremex, Helsinki, 516 pp.

VIITASAARI M. 2002b: The Northern European Taxa of Pamphiliidae. Pp. 235–358. In: VIITASAARI M. (ed.): *Sawflies (Hymenoptera, Symphyta) I. A review of the suborder, the Western Palaearctic taxa of Xyeloidea and Pamphilioidea*. Tremex, Helsinki, 516 pp.

WU X., XIN H., LIU H., YANG Q. & WEI M. 2016: A new species of *Acantholyda* Costa (Hymenoptera, Pamphiliidae) damaging *Picea crassifolia* from China. *Scientia Silvae Sinicae* **52 (9)**: 103–106 (in Chinese, English abstract).

WU X., XIN H. & YANG Q. 2014: A new species of *Acantholyda* Costa (Hymenoptera, Pamphiliidae) from China. *Forest Research* 27 (3): 400–402 (in Chinese, English abstract).