



First records of the genus *Gnathochorisis* Förster (Hymenoptera, Ichneumonidae, Orthocentrinae) in the Oriental region

Andrei E. Humala¹

¹ Forest Research Institute, Karelian Research Centre, Russian Academy of Sciences, 185910, Pushkinskaya St. 11, Petrozavodsk, Russia

Corresponding author: Andrei E. Humala (humala@krc.karelia.ru)

Academic editor: V. Gokhman | Received 14 May 2021 | Accepted 24 June 2021 | Published 24 August 2021

<http://zoobank.org/E00BDBA4-27A3-4A11-BF7F-5E4EAE916BA8>

Citation: Humala AE (2021) First records of the genus *Gnathochorisis* Förster (Hymenoptera, Ichneumonidae, Orthocentrinae) in the Oriental region. In: Proshchalykin MYu, Gokhman VE (Eds) Hymenoptera studies through space and time: A collection of papers dedicated to the 75th anniversary of Arkady S. Lelej. Journal of Hymenoptera Research 84: 103–113. <https://doi.org/10.3897/jhr.84.68700>

Abstract

Oriental members of the genus *Gnathochorisis* Förster, 1869 (Ichneumonidae: Orthocentrinae) are reviewed, two species: *G. leleji* **sp. nov.** from Malaysia and *G. malaisei* **sp. nov.** from Myanmar, are described and illustrated. The genus *Gnathochorisis* is recorded from the Oriental region for the first time.

Keywords

Darwin wasps, Malaysia, Myanmar, new species, parasitoids, South East Asia, taxonomy

Introduction

Gnathochorisis Förster, 1869 is a moderately small genus of Darwin wasps of the subfamily Orthocentrinae. It was established by A. Förster with the type species *Gnathochorisis flavipes* Förster, 1871 from Germany, together with two other genera: *Blapticus* Förster, 1869 and *Laepserus* Förster, 1869 (Förster 1869). Subsequently some *Blapticus* species were transferred to the genus *Acroblapticus* Schmiedeknecht, 1911 established for *Gnathochorisis* species excluding *G. flavipes* (Schmiedeknecht 1911). Later *Acroblapticus* and *Laepserus* were synonymized with *Gnathochorisis* (Aubert 1966, 1969), and *Blapticus*

species were divided between *Gnathochorisis* and *Symplexis* Förster, 1869 (van Rossem 1981). Western Palaearctic species of *Gnathochorisis* were revised by van Rossem (1981, 1987); three more species have been described from the Eastern Palaearctic (Humala 2007; Humala et al. 2016; Watanabe 2020). In North America, this genus has been revised by Dasch (1992); he reported eight species of the genus for the Nearctic, two of them with Holarctic distribution. Seven species of this genus were described from the Neotropics (Humala 2017). This genus has also been reported from the Philippines (Baltazar 1964) and Australia (Gauld 1984), but these materials were not examined by the author of this study. At present no species have been described from these regions, as well as from the Afrotropical region, where this genus also occurs, although the species diversity there can be comparable with the Neotropics. In total, *Gnathochorisis* comprises 23 described species (Yu et al. 2016; Humala 2017; Watanabe 2020).

The biology of *Gnathochorisis* is almost unknown, scarce rearing data exist only for the Palaearctic *G. flavipes* parasitizing larvae of a fungus gnat, *Neoempheria striata* (Meigen, 1818) (Diptera: Mycetophilidae) (Humala 2003), while other published records (Dasch 1992; Yu et al. 2016) of sawfly hosts (Hymenoptera: Symphyta) seem to be doubtful.

The aim of this work is to describe two new Oriental species of *Gnathochorisis*, representing first records of the genus for this region.

Materials and methods

The specimens examined in this study are deposited in the following collections:

- MZLU** Zoological Museum, Lund University, Sweden;
NHRS Naturhistoriska Riksmuseet, Stockholm, Sweden;
ZISP Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia.

Morphological terminology follows Broad et al. (2018). Specimens were examined using a Leica MZ9.5 stereomicroscope. Photographs were taken with an Olympus OM-D digital camera attached to an Olympus SZX10 stereomicroscope at ZISP; partially focused images were combined using Helicon Focus Pro software (v. 7.6.6).

Taxonomy and results

Genus *Gnathochorisis* Förster, 1869

Gnathochorisis Förster, 1869: 152. Type species: *Gnathochorisis flavipes* Förster, 1871: 113.
Blapticus Förster, 1869: 171. Type species: *Blapticus leucostomus* Förster, 1871: 83.
Laepserus Förster, 1869: 205. Type species: *Blapticus crassulus* Thomson, 1888: 1289.
Acroblapticus Schmiedeknecht, 1911: 2173. Type species: *Blapticus dentifer* Thomson, 1888: 1288.

Description. Fore wing 2.3–5.4 mm long. Body stout; head clearly transverse, clypeus small, weakly to strongly separated from face by a groove, flattened; occipital carina complete; face polished to slightly matt, sparsely to moderately punctate; eyes large, inner orbits subparallel to slightly divergent ventrally; mandible small, not or slightly twisted inwards, sometimes tapered and sinuous; lower tooth shorter than upper tooth; malar space with subocular sulcus; antenna moderately long; scape elongate, subcylindrical, hind margin of apical truncation not membranous; male flagellum lacking tyloids. Mesosoma finely or densely punctate on mesoscutum, polished on mesopleuron. Notauli short or reaching centre of mesoscutum, moderately deep; epomia usually weak and short. Epicnemial carina complete, dorsally distant from anterior margin of mesopleuron; propodeum polished or matt, usually with complete and distinct carinae, often with developed apophyses. Fore wing with areolet present or absent, sessile or short petiolate, rectangular when present. Hind wing with nervellus (cu-a + CU) intercepted below the middle, second abscissa of CU distinct. Hind legs stout, as a rule, hind femur strongly thickened, 2.85–4.9 times as long as broad, hind claws fairly large. First metasomal segment petiolate; sternite fused to tergite and reaching 0.5–0.6 of the segment, spiracles near middle of segment; glymma lacking. Second tergite matt or polished, often with longitudinal striae. Ovipositor upcurved, its sheath nearly as long as first tergite, with a dorsal subapical notch.

Diagnosis. *Gnathochorisis* can be distinguished from other orthocentrine genera belonging to the tribe Helictini by the following combination of characters: body stout; scape subcylindrical, elongate, not inflated, and its hind margin of apical truncation not membranous; male flagellum lacking tyloids; female inner orbits subparallel or slightly divergent downwards; sternaulus short; propodeum usually with complete carinae; fore wing with sessile or shortly petiolate areolet, if areolet absent, then vein 2rs-m moderately long; hind femur stout; hind claws enlarged; first metasomal segment petiolate, its tergite and sternite fused and glymmae absent. Together with *Symplecis*, *Catastenus* Förster, 1869 and *Eusterinx* Förster, 1869, *Gnathochorisis* forms the so-called *Eusterinx*-group (Wahl 1990; Wahl and Gauld 1998). This monophyletic group can be distinguished from other orthocentrines by the fused tergite and sternite of the first segment of metasoma, absence of glymmae, and mostly complete carination of the propodeum. *Gnathochorisis* differs from *Catastenus* and *Symplecis* in having ovipositor upcurved, with a dorsal subapical notch, 0.5–1.1 times as long as hind tibia, and female inner orbits subparallel or slightly divergent downwards. *Gnathochorisis* species can be distinguished from *Eusterinx* by stout body, transverse head and nervellus intercepted in lower half.

***Gnathochorisis leleji* Humala, sp. nov.**

<http://zoobank.org/030D2238-0925-4074-9062-8070DE42C026>

Figures 1–8

Material examined. *Holotype*: MALAYSIA • ♀; N. Borneo, Sabah, Sipitang, Mendolung; [4.93°N, 115.76°E, exact locality uncertain]; T4/R; 14 Mar. 1989; S. Adebratt

leg.; MZLU. **Paratypes:** MALAYSIA; same data as for holotype, but T3/W5; • 2 ♀♀; 2 Mar. 1989; MZLU and ZISP • 1 ♂; 8 Mar. 1989; ZISP • 1 ♂; 31 Mar. 1989; MZLU.

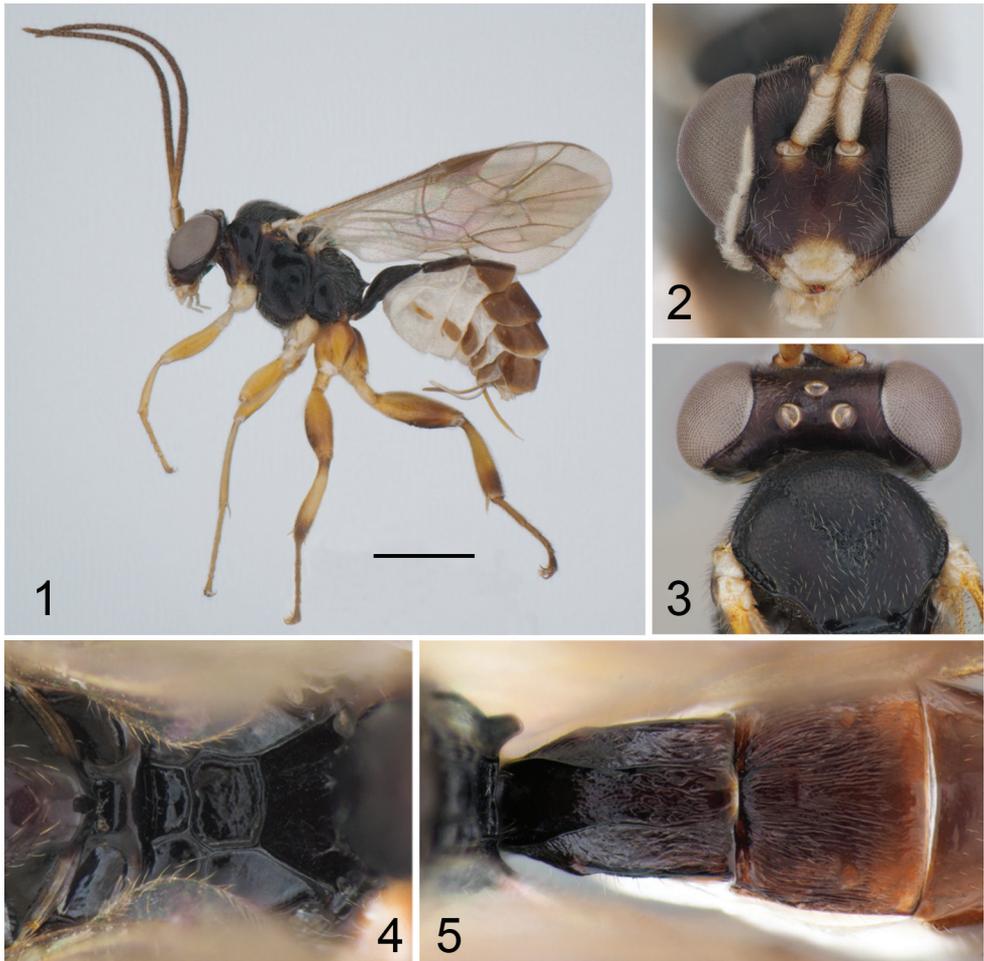
Diagnosis. *Gnathochorisis leleji* sp. nov. can be distinguished from the majority of species of the genus by the lack of closed areolet. From the other two similar known species without areolet (*G. flavipes* and *G. fuscipes* Humala & Lee, 2016), the new species differs in the strongly transverse head, and stronger apophyses on propodeum. From the East Palaearctic *G. fuscipes*, the new species differs in having a narrow face with width 0.45 times head width at the level of antennal sockets (0.51–0.53 times in *G. fuscipes*), slenderer flagellum with first flagellomere about 4.7 times as long as wide (3.9 times in *G. fuscipes*), predominantly yellow hind legs (hind coxa dark brown in *G. fuscipes*), and a shorter ovipositor – 0.8 times as long as first tergite (as long as first tergite in *G. fuscipes*). From the Palaearctic *G. flavipes* it differs in lack of yellowish posterior band on T2 (present in *G. flavipes*) and inclivous nervellus (almost vertical in *G. flavipes*). The new species is also characterized by the unique semicircular formation with reticulate microsculpture of T4 of male metasoma, not known in other congeners.

Description. Female (Figs 1–5). Body length 4.0–4.1 mm; fore wing length 3.3–3.4 mm.

Head. Head width 1.25 times its height; face width at level of antennal sockets 1.7 times its height, 0.45 times head width, subpolished and closely punctate with long sparse setae; frons, vertex and occiput matt; occipital carina present; eyes large, convex, without setae, inner orbits slightly divergent ventrally (Fig. 2); clypeus width 1.6 times its height, weakly separated from face, with posterior margin truncate; anterior tentorial pits distinct; malar space 1.8 times as long as basal width of mandible; subocular sulcus nearly straight; mandibles bidentate, tapered, lower tooth shorter than upper tooth (Fig. 2). Antenna long, with 21 flagellomeres, scape long, subcylindrical, about 2.3 times as long as wide; first flagellomere 4.4–4.7 times as long as wide apically, second flagellomere 3.5–3.6 times as long as wide apically. Head strongly transverse, temple very short; ocelli of moderate size, ocular-ocellar line 1.1 times as long as maximum diameter of lateral ocellus; postocellar line 1.3 times as long as maximum diameter of lateral ocellus (Fig. 3).

Mesosoma. Mesosoma 1.4 times as long as maximum height; epomia well developed; mesoscutum nearly polished, notauli deep, extending to centre of mesoscutum, forming rugulose area there (Fig. 3); epicnemial carina complete, ending close to upper anterior corner of mesopleuron; sternaulus short but distinct; scutellum high; propodeum polished, with complete carination, area superomedia clearly transverse, 0.7 times as long as wide (Fig. 4), apophyses well developed with rounded apices (Fig. 5). Mesopleuron and metapleuron polished. Fore wing without areolet; vein 2m-cu with two bullae; hind wing with nervellus (cu-a + CU) inclivous, intercepted in lower 0.3. Hind leg with coxa punctate; femur somewhat inflated, 3.0 times as long as maximum width; basitarsus 0.4 times as long as hind tibia, tibial spurs slender, and claws strongly curved.

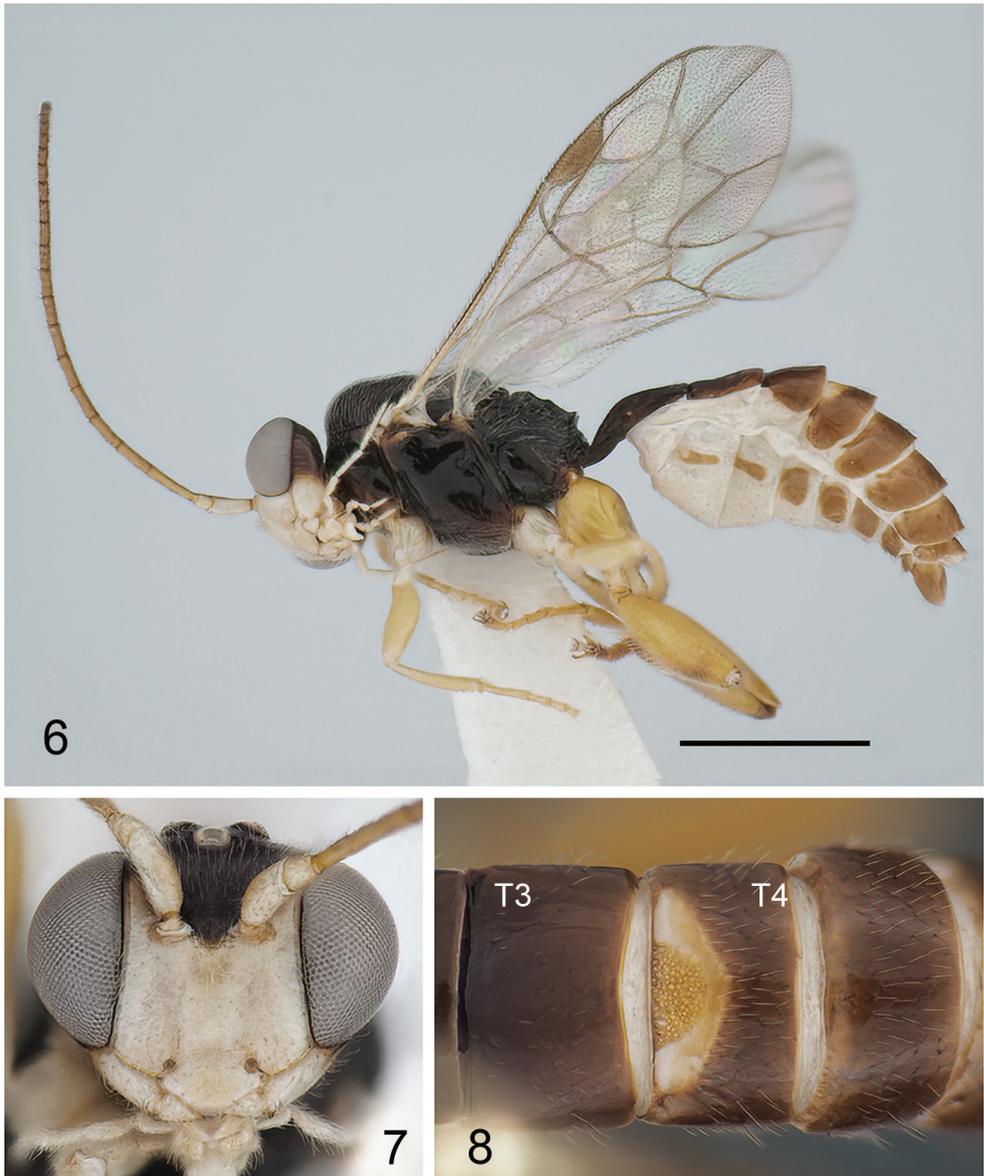
Metasoma. First metasomal segment 1.6 times as long as its maximum posterior width, postpetiole with dorsal carinae and irregular longitudinal striae; dorso-lateral



Figures 1–5. *Gnathochorisis leleji* sp. nov., holotype female **1** habitus, lateral view **2** head, anterior view **3** head and mesoscutum, dorsal view **4** propodeum, dorsal view **5** metasoma, tergites 1–2, dorsal view. Scale bar: 1.0 mm (**1**).

carina distinct, extending above spiracle; glymma absent, spiracle situated at 0.5 length of first tergite, apex of first sternite at 0.4 of segment; T2 0.8 times as long as its maximum posterior width, with small indistinct first thyridium and more conspicuous second thyridium behind the middle, longitudinally striate in anterior 3/4, subpolished in posterior 1/4 (Fig. 5). Remaining tergites subpolished; sternites membranous with sclerotized patches on S2 to S7. Ovipositor upcurved with dorsal subapical notch, ovipositor sheath 0.8 times as long as first tergite and 0.75 times as long as hind tibia.

Colour. Dark brown. Clypeus, mandibles, excluding brown teeth, palpi, mouthparts, scape and pedicel ventrally, dorso-lateral corner of pronotum, tegula, fore and mid coxae and trochanters yellowish white. Face, flagellum, lower malar space, propleuron, mesepisternum, tergites 2–7 and sclerotized patches of sternites brown. Fore



Figures 6–8. *Gnathochorisis leleji* sp. nov., paratype male **6** habitus, lateral view **7** head, anterior view **8** metasoma, tergites 3–5, dorsal view. Scale bar: 1.0 mm (**6**).

and mid femur, tibia and tarsus and hind leg yellowish, excluding dark brown hind femur posteriorly, anterior narrow band and posterior third of hind tibia. Wings hyaline, veins and pterostigma brown.

Male (Figs 6–8). Body length 4.1 mm; fore wing length 2.9 mm.

Similar to female, but slenderer. Antenna with 20–21 flagellomeres, first flagellomere 4.5 times as long as wide; T4 anteriorly with weakly sclerotized triangular area surrounding a medio-anterior semicircular formation with reticulate microsculpture (Fig. 8).

Face, clypeus, mandibles, lower frontal orbits, malar space, gena, palpi, mouth parts, scape, pedicel, upper posterior corner of pronotum, tegula, bases of wings, fore and mid coxae and trochanters yellowish white. Subtegular ridge, rest of fore and mid legs, and hind legs yellowish, excluding brown hind femur posteriorly, anterior narrow band and posterior third of hind tibia. Flagellum brownish; T1 dark brown, rest of metasoma brown, excluding yellowish anterior part of T4 and bases of T5 to T7.

Etymology. The new species is named in honour of Prof. Arkady S. Lelej – a well-known Russian entomologist, in recognition of his significant contribution to the study of Hymenoptera, and also in celebration of his 75th birthday.

Distribution. Malaysia (Sabah).

***Gnathochorisis malaisei* Humala, sp. nov.**

<http://zoobank.org/DEC1710F-576D-4963-A992-ABFE31AC2074>

Figures 9–13

Material examined. Holotype: MYANMAR • ♀; N.E. BURMA, Kambaiti; 7000 ft [2100 m]; 24 May 1934; R. Malaise leg.; NHRS.

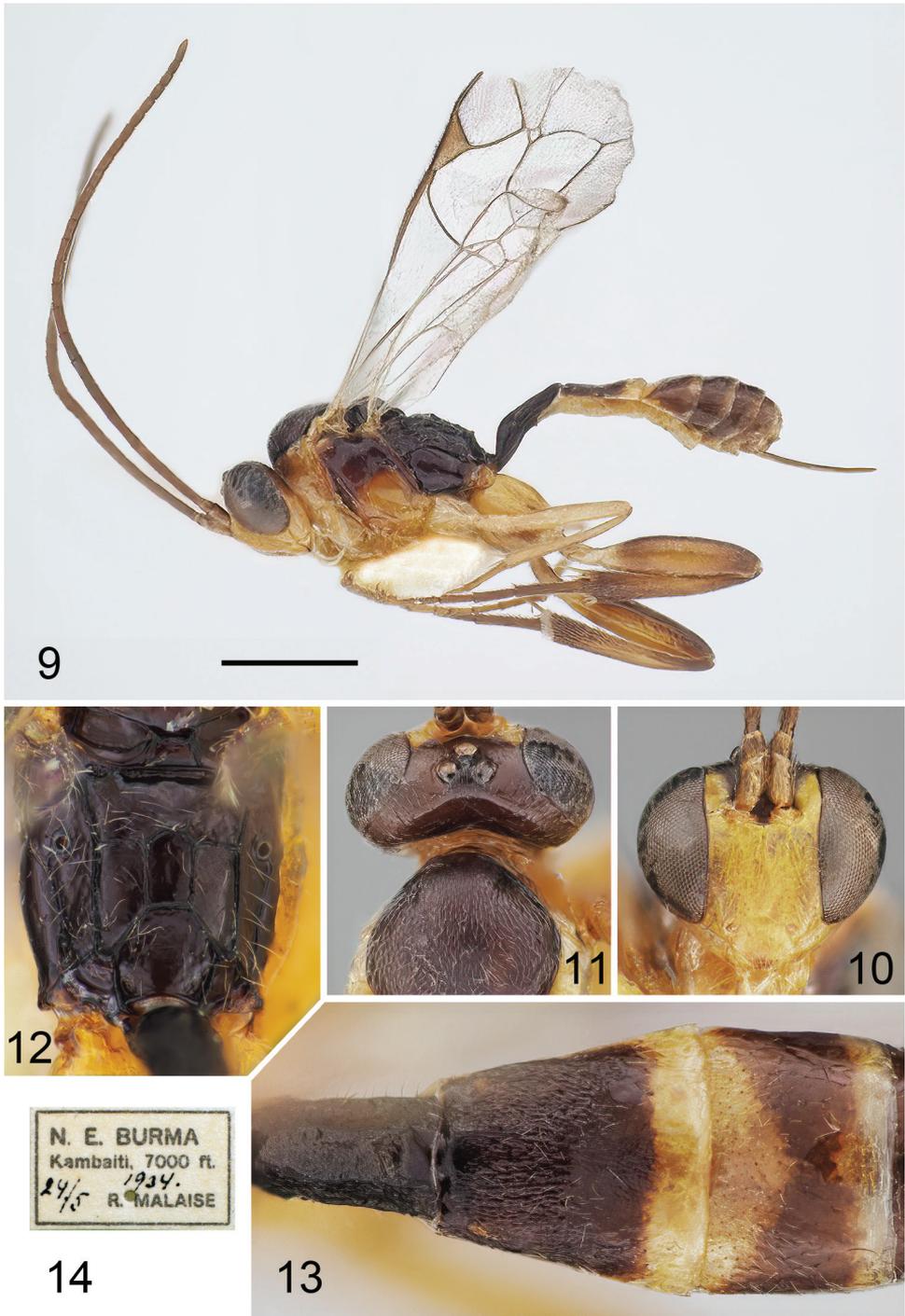
Diagnosis. *Gnathochorisis malaisei* sp. nov. differs from congeners in having an areolet in fore wing, elongate area superomedia of propodeum (1.6 times as long as wide) (Fig. 12), yellowish face and reddish brown frons, with lower frontal orbits widely yellow (Figs 10, 11), comparatively long T1 (about 2.5 times as long as wide posteriorly), and T2 transversely impressed in the middle.

This species resembles the Neotropical *G. dilleri* Humala, 2017 in the elongate area superomedia of propodeum, but it can be easily distinguished by the presence of lateral sections of anterior transverse carina, stouter hind femur (4.0 times as long as broad), yellow face and dark mesoscutum and propodeum.

Description. Female. Body length 4.2 mm; fore wing length 3.5 mm.

Head. Head width 1.7 times its height; face width at level of antennal sockets 1.35 times its height, 0.5 times head width, subpolished and closely punctate; frons, vertex and occiput polished; occiput somewhat depressed, occipital carina present; eyes large, convex, without setae, inner orbits subparallel (Fig. 10); clypeus width 1.5 times its height, weakly separated from face, posterior margin of clypeus very weakly convex; anterior tentorial pits distinct; malar space 1.2 times as long as basal width of mandible; subocular sulcus distinct, sharp and straight; mandible bidentate, strongly tapered, lower tooth small (Fig. 10). Antenna longer than body, with 23 slender flagellomeres, all flagellomeres longer than wide; scape about twice as long as wide; first flagellomere 5.3 times as long as wide apically, second flagellomere 4.4 times as long as wide apically. Ocelli of moderate size, ocular-ocellar line 1.25 times and postocellar line 0.6 times as long as maximum diameter of lateral ocellus (Fig. 11); temple moderately short, 0.35 times as long as compound eye width.

Mesosoma. Mesosoma 1.4 times as long as maximum height, polished; epomia well developed; mesoscutum subpolished with dense light setae, notauli short, developed in anterior 1/3 of mesoscutum; scutellum not particularly high, with lateral carinae anteriorly;



Figures 9–13. *Gnathochoris malaisei* sp. nov., holotype female **9** habitus, lateral view **10** head, anterior view **11** head and mesoscutum, dorsal view **12** propodeum, dorsal view **13** metasoma, tergites 2–3, dorsal view **14** original label. Scale bar: 1.0 mm (**9**).

epicnemial carina complete, ending at upper corner of mesopleuron; sternaulus short but distinct (Fig. 9); mesopleuron, metapleuron and propodeum polished, with sparse setae; propodeal carination complete, excluding reduction of anterior sections of lateromedian longitudinal carinae. Area superomedia elongate, parallel-sided, 1.6 times as long as wide; short sections of posterior transverse carina connecting with lateral longitudinal carinae form small rounded apophyses; propodeal spiracle large, round, joined by short carina with pleural carina (Fig. 12). Fore wing with small petiolate areolet; vein 2m-cu with two bullae; vein 1cu-a slightly distad of vein M&RS; hind wing with nervellus (CU + cu-a) intercepted in lower 0.4, second abscissa of CU present. Hind coxa punctate; hind femur 4.0 times as long as maximum width (Fig. 9); hind basitarsus 0.4 times as long as hind tibia, tibial spurs long and slender, claws long and thin, strongly bent.

Metasoma. First metasomal segment 2.5 times as long as maximum width posteriorly, T1 subpolished, with distinct dorsal carinae reaching posterior margin; sternite and tergite fused, glymma absent, spiracle situated at basal 0.4 length of T1, apex of first sternite at 0.55 of segment. T2 as long as maximum width posteriorly, coriaceous, with small thyridium and some irregular longitudinal striae in anterior 2/3, subpolished in posterior third (Fig. 13); in profile T2 transversely impressed in the middle behind spiracles; remaining tergites nearly impunctate. Ovipositor slightly upcurved with dorsal subapical notch, ovipositor sheath 1.2 times as long as first tergite and 0.7 times as long as hind tibia.

Colour. Dark brown. Antenna light brown. Frons, vertex, occiput and temple brown; palpi, tegula, subtegular ridge, base of wings, fore and mid legs, hind trochanters and hind coxa anteriorly pale; face, frontal orbits, clypeus, mandibles, excluding reddish-brown teeth, malar space, gena, propleuron, most of pronotum, lower mesopleuron, mesosternum and hind coxa yellowish. Hind femur light brown medially, darkened dorsally, subanteriorly and posteriorly, hind tibia light brown, infusate anteriorly and posteriorly, hind tarsus dark brown. Wings hyaline, veins and pterostigma light brown. Second tergite dark brown with thyridium and posterior margin yellowish, T3 anteriorly with yellowish band widened medially, other tergites mostly brown with posterior margins yellowish.

Male. Unknown.

Etymology. The new species is named in honor of its collector René Malaise, a Swedish hymenopterist, expert on sawflies (Hymenoptera: Symphyta), famous for his invention of the “Malaise trap”.

Distribution. Myanmar [Burma].

Acknowledgments

I am deeply grateful for the loan of materials from the collections of the Zoological Museum of Lund University (curator Roy Danielsson) and Swedish Museum of Natural History (curator Hege Vårdal). A special thanks to Andrey I. Khalaim (ZISP) for his help in taking the photographs of the type specimens. I also thank Kyohei Watanabe,

Kazuhiko Konishi, Andrew Bennett, Andrey I. Khalaim, Janko Kolarov and Vladimir Gokhman, who provided useful criticism and valuable comments, for reviewing and editing the manuscript. This work was carried out under a state order implemented by Forest Research Institute KarRC RAS.

References

- Aubert J-F (1966) Révision des travaux concernant les Ichneumonides de France et 5e supplément au catalogue de Gaulle (90 especes nouvelles pour la fauna de France). Bulletin mensuel de la Société linnéenne de Lyon 35(2): 81–90. <https://doi.org/10.3406/linly.1966.5802>
- Aubert J-F (1969) Deuxième travail sur les Ichneumonides de Corse (Hymenoptera). Veröffentlichungen der zoologischen Staatssammlung, München 13: 27–70.
- Baltazar CR (1964) The genera of parasitic Hymenoptera in the Philippines, Part 2. Pacific Insects 6(1): 15–67.
- Broad GR, Shaw MR, Fitton MG (2018) Ichneumonid Wasps (Hymenoptera: Ichneumonidae): their Classification and Biology. Royal Entomological Society and the Field Studies Council, Handbooks for the Identification of British Insects 7(12): 1–418.
- Dasch C (1992) The Ichneumon-flies of America North of Mexico. Pt.12. Subfamilies Microleptinae, Helictinae, Cylloceriinae and Oxytorinae (Hymenoptera: Ichneumonidae). Memoirs of the American Entomological Institute 52: 1–470.
- Förster A (1869) Synopsis der Familien und Gattungen der Ichneumonen. Verhandlungen des Naturhistorischen Vereins der Preussischen Rheinlande und Westfalens 25: 135–221.
- Förster A (1871) Übersicht der Gattungen und Arten der Familie der Plectiscoiden. Verhandlungen des Naturhistorischen Vereins der Preussischen Rheinlande und Westfalens 28: 71–123.
- Gauld ID (1984) An introduction to the Ichneumonidae of Australia. British Museum (Natural History), London, 895, 413 pp.
- Humala AE (2003) The ichneumonid wasps in the fauna of Russia and adjacent countries: Subfamilies Microleptinae and Oxytorinae (Hymenoptera: Ichneumonidae). Nauka, Moscow, 176 pp. [in Russian]
- Humala AE (2007) Subfamily Orthocentrinae. In: Lelej AS (Ed.) Opredelitel' nasekomykh Dal'nego Vostoka Rossii [Keys to the Insects of the Russian Far East]. Dal'nauka, Vladivostok, 4: 680–718. [in Russian]
- Humala AE (2017) New species of *Gnathochorisis* Förster (Hymenoptera, Ichneumonidae: Orthocentrinae) from the Neotropical region. Zootaxa 4250(3): 201–218. <https://doi.org/10.11646/zootaxa.4250.3.1>
- Humala AE, Choi JK, Lee JW (2016) A review of the genera *Gnathochorisis* Förster and *Symplecis* Förster of South Korea, with notes on Korean orthocentrines (Hymenoptera, Ichneumonidae, Orthocentrinae). ZooKeys 562: 85–104. <https://doi.org/10.3897/zookeys.562.7303>
- van Rossem G (1981) A revision of some Western Palaearctic Oxytorine genera, including two new genera *Phosphorus* and *Ephalmator*. Spixiana Supplement 4: 79–135.

- van Rossem G (1987) A revision of Western Palaearctic Oxytorine genera. Part VI. Tijdschrift voor Entomologie 130: 49–108.
- Schmiedeknecht O (1911) Ophioninae. Opuscula Ichneumonologica, Band IV, Blankenburg in Thüringen 2161–2271.
- Thomson CG (1888) Försök till gruppering af slägtet *Plectiscus* (Grav.). Opuscula Entomologica, Lundensis XII (38): 1266–1318.
- Wahl D (1990) A review of the mature larvae of Diplazontinae, with notes on larvae of Acaenitinae and Orthocentrinae and proposal of two new subfamilies (Insecta: Hymenoptera, Ichneumonidae). Journal of Natural History 24: 27–52. <https://doi.org/10.1080/00222939000770041>
- Wahl DB, Gauld ID (1998) The cladistics and higher classification of the Pimpliformes (Hymenoptera: Ichneumonidae). Systematic Entomology 23(3): 265–298. <https://doi.org/10.1046/j.1365-3113.1998.00057.x>
- Watanabe K (2020) Review of the genus *Gnathochorisis* Förster, 1869 (Hymenoptera: Ichneumonidae: Orthocentrinae) from Japan, with description a new species. Japanese Journal of Systematic Entomology 26(1): 48–52.
- Yu DSK, van Achterberg C, Horstmann K (2016) Taxapad 2016, Ichneumonoidea 2015. Database on flash-drive. Nepean, Ontario.