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Research article

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New *Pristaulacus* Kieffer, 1900 (Hymenoptera, Evanioidea, Aulacidae) from India and Malaysia with a key to species and a revised checklist

Giuseppe Fabrizio TURRISI^{1,*} & Vittorio NOBILE^{†2}

¹Museum of Natural History La Specola, Entomology, University of Florence,
Via Romana 17, 50125, Florence, Italy.

²Via Psaumida, 17, lotto 25, 97100 Ragusa, Italy.

*Corresponding author: giuseppfabrizio.turrisi@unifi.it

²Email: giuseppfabrizio.turrisi@unifi.it

¹[urn:lsid:zoobank.org/author:E8D5E4D3-93EF-405D-9099-B6625CFBB3E4](https://zoobank.org/author:E8D5E4D3-93EF-405D-9099-B6625CFBB3E4)

²[urn:lsid:zoobank.org/author:DDB4B0D1-21C6-4A60-B101-C0F7B8C5BD7C](https://zoobank.org/author:DDB4B0D1-21C6-4A60-B101-C0F7B8C5BD7C)

Abstract. Two new species of aulacid wasps, *Pristaulacus iuliae* Turrisi & Nobile sp. nov. from South India (Karnataka) and *Pristaulacus ninae* sp. nov. from Peninsular Malaysia (Pahang), are described, figured and compared with most related species. Based on the present addition, the Indomalayan area currently includes 27 species of *Pristaulacus* Kieffer out of 61 known from the whole Oriental Region, which is however a largely underestimated number. An identification key to species and an updated checklist of *Pristaulacus* occurring in the Indomalayan area are provided.

Keywords. Taxonomy, new species, checklist, Aulacidae, *Pristaulacus*.

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Introduction

Aulacidae Hedicke, 1939 represent a remarkable group of koinobiont endoparasitoids of wood-boring larvae of Coleoptera Linnaeus, 1758 and other Hymenoptera Linnaeus, 1758 (Skinner & Thompson 1960; Jennings & Austin 2004) with a peculiar appearance having a subglobose head, the mesosoma more or less coarsely sculptured, the metasoma more or less compressed laterally attached high on a pyramidal propodeum, the hind coxal foramina far below the propodeal foramen and forewing with vein 2m-cu present (Turrisi *et al.* 2009; Turrisi 2023). Aulacids' hosts are mostly larval Cerambycidae Latreille, 1802, less frequently larval Xiphydriidae Leach, 1819 and Buprestidae Leach, 1815 (Smith 2001; Jennings & Austin 2004; Turrisi & Vilhelmsen 2010). Aulacidae currently comprises 315 extant species belonging to two genera, *Aulacus* Jurine, 1807, with 124 species, and *Pristaulacus* Kieffer, 1900 (including the former *Panaulix* Benoit, 1984), with 191 species (Smith 2001; Turrisi *et al.* 2009; Turrisi 2017, and recent additions, e.g., Smith *et al.* 2023 for a summary), although the expected real number of species should exceed 500 (Smith 2017; Turrisi 2017). Both genera are represented in all zoogeographic

regions, except Antarctica, and *Aulacus* is not known from the Afrotropics (Kieffer 1912; Hedicke 1939; Smith 2001; Turrisi *et al.* 2009; Turrisi 2017).

As recently outlined (Turrisi 2017), the highest number of aulacid species occurs in tropical areas. The Oriental Region hosts a very diverse and rich fauna, although a significant part of the species occurring there still remains undescribed (Turrisi & Smith 2011; Smith 2017a; Turrisi 2017). The Oriental aulacids are poorly known, and there is no modern comprehensive treatment. The early taxonomic exploration by Shuckard (1841), Westwood (1868), Cameron (1887, 1899, 1900, 1905, 1906, 1907), Enderlein (1912) and Turner (1919a, 1919b, 1922) only provided single species descriptions. The only worldwide treatments of the family by Kieffer (1912) and Hedicke (1939) are significant but largely outdated and of little help to-date. Only in recent time, the growing taxonomic interest in this family has resulted in the publication of many additions, especially from poorly known areas (Smith 1997, 2016, 2017a, 2017b; He *et al.* 2002; Sun & Sheng 2007; Turrisi & Watanabe 2011; Turrisi 2013, 2014; Turrisi & Madl 2013; Turrisi & Nobile 2016; Chen *et al.* 2016; Smith & Turrisi 2020; Turrisi & Smith 2020), sometimes with a wide revisionary approach (Turrisi & Smith 2001) which increased significantly the number of described species, reaching a total of 66 (7 *Aulacus* and 59 *Pristaulacus*).

In the present contribution, we add two new species of *Pristaulacus* from India and Malaysia, respectively, and provide an updated checklist and a key to species of the Indomalayan area.

Material and methods

Specimens examination

This study is based primarily on the examination of museum material of The Natural History Museum, London, United Kingdom (NHMUK), including many type specimens. Other material served as comparison for taxonomic analyses of species involved in the ‘key to species’ (see below), belonging to the Naturhistorisches Museum, Vienna, Austria (NMW) and the Biologiezentrum, Oberösterreichische Landes-Kultur, Linz, Austria (OLML).

Specimens were studied using a Wild M5A stereo microscope and measurements were taken with the aid of an ocular scale. Photographs were taken through an Olympus Stylus TG-6 Tough 12.0 megapixel digital camera under “microscope mode”, using the “internal focus stacking” option according to Mertens *et al.* (2017), and lighting was achieved through a white styrofoam light-chamber with two led light-spots 6.5W/6500K and an opaque paper filter around the sample. Final images were post-processed to improve contrast and light levels and crop the subject using PhotoScape X[®] software for Mac. The photographic plates were assembled using Draw Drawing (Libre Office)[®] for Mac.

Terminology and abbreviations

Morphological nomenclature follows Crosskey (1951), Huber & Sharkey (1993), and Gauld & Bolton (1996). Terminology for surface sculpture follows Harris (1979). For wing venation and cells, we refer to Turrisi (2007) and Turrisi & Smith (2011: figs 1–2). The format for descriptions follows mostly Turrisi & Smith (2011), expanded with some additional characters according to Smith (2008). Regarding the number of tooth-like processes on the inner margin of the claw, the apex is not included, since it represents the tip of the claw (Turrisi 2007).

Abbreviations for morphological structures

- A = antennomere
- B = basal cell
- D = discal cell
- M = marginal cell

OOL = distance between posterior ocellus and eye
PO = distance between posterior ocelli
S = sternite
SB = subbasal cell
SD = subdiscal cell
SM = submarginal cell
T = tergite

See Turrisi *et al.* (2009) for taxonomic history. A detailed catalogue of World species is provided by Smith (2001), checklist of species is provided by Turrisi *et al.* (2009) updated by Turrisi (2017).

Results

Taxonomy

Class Insecta Linnaeus, 1758
Order Hymenoptera Linnaeus, 1758
Suborder Apocrita Gerstaecker, 1867
Superfamily Evanioidea Latreille, 1802
Family Aulacidae Shuckard, 1841
Subfamily Aulacinae Shuckard, 1841
Tribe Aulacini Shuckard, 1841
Genus *Pristaulacus* Kieffer, 1900

Pristaulacus iuliae sp. nov.

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Figs 1–3, Table 1

Diagnosis

Small-sized species, body length: 8.3 mm; antenna length: 4.8 mm; forewing length: 6.3 mm; ovipositor length: 6.7 mm (Fig. 1). Colour mostly black, legs partly dark reddish or brownish to orange, wings hyaline, forewing with a moderately wide subquadrate substigmal light brown spot, basal part of metasoma dark brown (Fig. 1); setae almost entirely whitish, long to very long, obscuring partly the cuticle beneath; gena from above, moderately developed, $0.7 \times$ eye length, sharply convex behind eye, moderately convergent posteriorly; anterior margin of mesonotum regularly rounded, pronotum with one straight, tooth-process on each lateroventral margin; ovipositor subequal to forewing length.

Etymology

The specific epithet is a special dedication to V. Nobile's grand-daughter, Giulia Nobile, a noun in the genitive case.

Type material

Holotype

INDIA • ♀; "S. INDIA, Mysore State Balehonnur, 1956, Coffee Research Inst. N°. 7/Pres. By Com Inst Ent BM 1958-174/COM. INST. ENT. COLL. NO 14733/*Aulacostethus* sp. ♀, det. J.F. Perkins. 1956/*Pristaulacus* sp. D.R. Smith"/*Pristaulacus iuliae* sp.n. ♀ Turrisi G.F. & Nobile V. Holotypus [red label]"; NHMUK.

Description

Female

MEASUREMENTS. Body length: 8.3 mm; antenna length: 4.8 mm; forewing length: 6.3 mm; ovipositor length: 6.7 mm.

COLOUR. Black, except: mandible and ventral of A1 extensively dark orange; legs mostly dark reddish to dark brown, tegula, fore and mid tibiae and tarsi orange; wings hyaline, forewing with moderately wide subquadrate substigmal light brown spot; metasomal segments 1+2 extensively dark brown; setae: goldish on mandible, whitish otherwise (Figs 1, 3A, E).

HEAD. Cuticle dull; vertex with fine, superficial and moderately dense punctures (distance between punctures $2.0\text{--}3.0\times$ puncture diameter); frons with fine, deep and dense punctures (distance between punctures $2.0\times$ puncture diameter); clypeus with fine, deep and dense punctures (distance between punctures $1.5\text{--}2.0\times$ puncture diameter); gena with fine, superficial and scattered punctures (distance between punctures $3.0\text{--}4.0\times$ puncture diameter), punctures coarse and denser behind eye margin; malar area with coarse, deep and very dense punctures (distance between punctures $0.2\text{--}0.5\times$ puncture diameter); head width/length: 1.3; malar distance/eye height: 0.3; gena from above, moderately developed (gena length/eye length: 0.7), sharply convex behind eye, moderately convergent posteriorly (Fig. 2A); lower interocular distance/ eye height: 1.1 (Fig. 2B); inner margin of eyes weakly convergent below; eye height/eye width: 1.3 (Fig. 2C); POL/OOL: 1.4; ocellar area width/length: 2.4; occipital margin straight; occipital carina moderately broad, lamelliform $0.4\times$ diameter of anterior ocellus; antenna length/forewing length: 0.8; length/width A3 5.0; length/width A4: 8.0; length/width A5: 7.2; A3/A4: 0.5; A3/A5: 0.7; A4/A5: 1.3; length/width A14: 1.9; setae: erect and dense on vertex and upper



Fig. 1. *Pristaulacus iuliae* sp. nov., holotype, ♀ (NHMUK), habitus, lateral view.

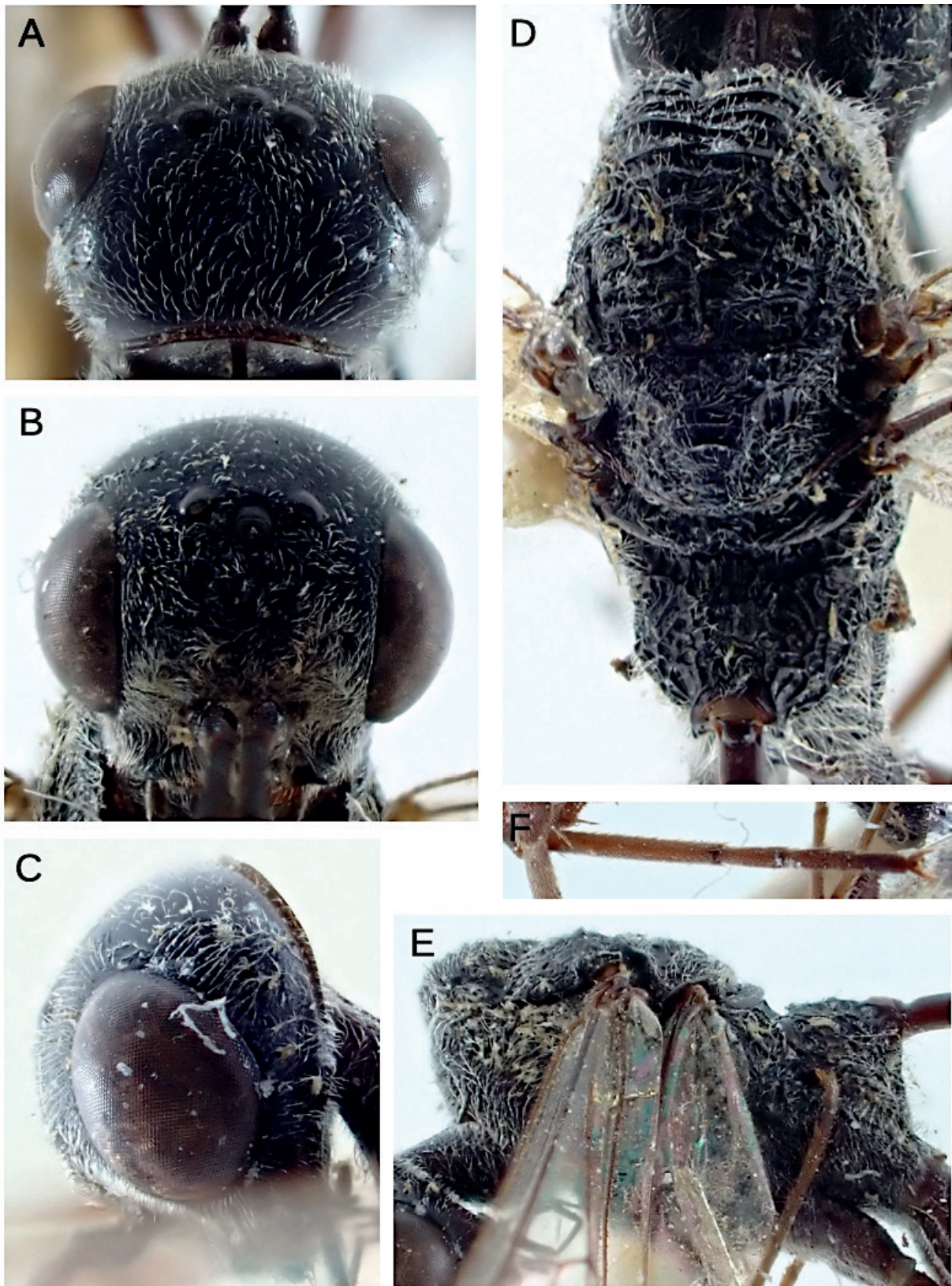


Fig. 2. *Pristaulacus iuliae* sp. nov., holotype, ♀ (NHMUK). **A.** Head, dorsal view. **B.** Head, frontal view. **C.** Head, lateral view. **D.** Mesosoma, dorsal view. **E.** Mesosoma, lateral view. **F.** Hind tarsus.

frons; recumbent and very dense on lower frons and clypeus; semierect, dense and long on gena (length of setae $1.0 \times$ diameter of anterior ocellus); recumbent and very dense on malar area.

MESOSOMA. Moderately elongate, mesosoma length/mesosoma height: 1.9, coarsely sculptured, shiny (Fig. 2D–E); pronotum areolate rugose, anterior margin straight, without tooth-like processes, with one moderately developed, forward and straight tooth-like process on each lateroventral margin (Figs 2E, 3B), posterior margin widely rounded, without process; propleuron polished and shiny with coarse, deep and very dense punctures on dorsal surface (distance between punctures $0.5\text{--}1.0 \times$ puncture diameter), and fine, superficial and moderately dense punctures on ventral surface (distance between punctures $2.0\text{--}3.0 \times$ puncture diameter); prescutum triangular, well defined by raised carinae, with moderately wide base, not concave, transverse-carinate; mesoscutum almost entirely transverse-carinate, parascutal area areolate-rugose; dorsally not prominent, anterior margin (lateral view) rounded, not overhanging pronotum; notauli well defined, moderately deep and wide, meeting each other quite before transscutal articulation; mesoscutellum not prominent, weakly convex, transverse-carinate on disc, areolate-rugose otherwise; mesopleuron areolate-rugose, with subalar area polished and very densely punctate-foveolate; metanotum confuse-rugose in middle, areolate-rugose otherwise; propodeum areolate-rugose, anterior margin longitudinally carinate; ventral parts of mesosoma confused carinate to areolate-rugose; vein 2-rs+m moderately long (Fig. 3A); coxa I polished with poorly defined, irregular and scattered punctures; coxa II transverse-carinate-punctate; coxa III transverse-carinate on dorsal surface, carinae dense and variously interrupted, and polished-punctate on ventral surface, punctures coarse, superficial and moderately dense (distance between punctures $2.0\text{--}2.5 \times$ puncture diameter); hind coxa elongate subcylindrical, length/width: 2.5 (Fig. 3C); hind coxal guide transverse, narrow, notch subterminal (Fig. 3C–D); inner and outer spurs of mid and hind tibia subequal; hind basitarsus slender, length/width: 10.3; hind basitarsus length $1.1 \times$ tarsomeres 2–5 length (Fig. 2F); tarsal claw with four tooth-like processes, basal process very weak; setae: erect, short and moderately dense dorsally; semi erect to recumbent, moderately long and dense on sides; semi erect, short and moderately dense on ventral surface; erect moderately long and moderately dense on hind surface of propodeum; erect, long and dense on propleuron (length of setae $0.5 \times$ fore pretarsus).

METASOMA. Pyriform (lateral view), moderately compressed laterally (Fig. 3E); metasoma $1.3 \times$ mesosoma length; petiole elongate, length/width: 3.0; metasomal segments 1+2 weakly shiny, micropunctate with sparse coarser punctures; remaining segments weakly shiny with fine, superficial and very dense punctures; S7 shiny with coarse, elongate, deep and dense punctures; ovipositor length about forewing length [inferred, ovipositor tip missing]; setae: metasomal segments 1+2 almost glabrous, very few sparse short setae on the medial part of T2; remaining tergites with recumbent, short and moderately dense setae; remaining sternites with semi erect short and moderately dense setae.

Male

Unknown.

Distribution

South India (Karnataka), known from type locality only.

Remarks

Pristaulacus iuliae sp. nov. could be placed near to *P. intermedius* Uchida, 1932 (see redescriptions in Konishi 1990 and Turrisi 2007) for the general appearance, but it is easily recognizable for the smaller size, around 8 mm (more than 10 mm in *P. intermedius*); shape of the head, with gena (dorsal view) moderately developed, $0.7 \times$ eye length, sharply convex behind eye, moderately convergent posteriorly (gena well developed, $1.1 \times$ eye length, widely rounded behind eye, gradually convergent posteriorly in *P. intermedius*; Turrisi 2007: fig. 14); POL/OOL: 1.4 and ocellar area width/length: 2.4 (POL/OOL: 0.9

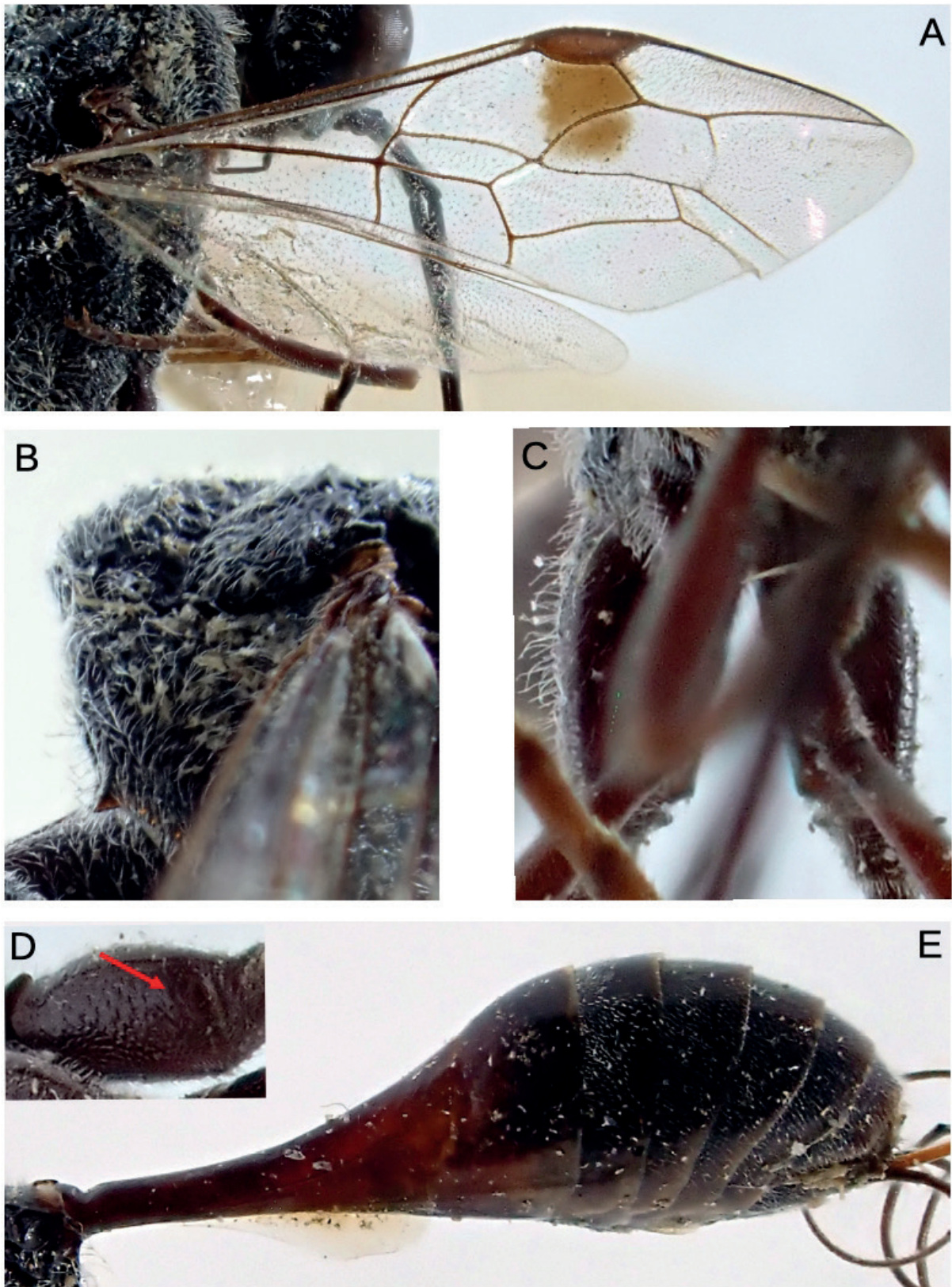


Fig. 3. *Pristaulacus iuliae* sp. nov., holotype, ♀ (NHMUK). **A.** Wings. **B.** Pronotum, lateral view. **C.** Hind coxae, ventral view. **D.** Hind coxa, inner lateral view (arrow indicates hind coxal groove). **E.** Metasoma, lateral view.

and ocellar area width/length: 2.0 in *P. intermedius*; Turrisi 2007: 49); setae on head and especially on mesosoma dense, cuticle not visible beneath on lateral part of mesosoma (setae on head and mesosoma moderately dense, cuticle well visible beneath on lateral part of mesosoma in *P. intermedius*, Turrisi 2007: 49); hind basitarsus length subequal tarsomeres 2–5 length (hind basitarsus length $1.2 \times$ tarsomeres 2–5 length in *P. intermedius*; Turrisi 2007: 49); ovipositor subequal to forewing length (distinctly longer in *P. intermedius*, about $1.2 \times$ forewing length).

***Pristaulacus ninae* sp. nov.**

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Figs 4–6, Table 1

Type material

Diagnosis

Medium sized species, body length: 10.7 mm; forewing length: 8.0 mm; ovipositor length: 9.3 mm (Fig. 4). Colour mostly black (Fig. 4), legs partly dark reddish to orange, wings hyaline, forewing slightly infuscate at extreme apex, with a small basal mark and a very wide subquadrate substigmal light brown, basal part of metasoma dark reddish brown; setae almost entirely whitish; head $1.3 \times$ as wide as long; gena, from above, well developed $0.9 \times$ eye length), almost straight, not convergent and rounded posteriorly; anterior margin of mesonotum regularly rounded, pronotum with one stout, tooth-process on each lateroventral margin; ovipositor $1.2 \times$ forewing length.

Etymology

The specific epithet is a special dedication to V. Nobile's late wife, Nina Spampinato, a noun in the genitive case.

Holotype

MALAYSIA • ♀; “PAHANG F.M.S., Cameron Highlands. Ginting Kial 5000 ft: 23.5.1989 [perhaps 1899]/Ex F.M.S. Museum, B.M., 1955-354.”/*Pristaulacus ninae* sp.n. ♀ Turrisi G.F. & Nobile V. Holotypus [red label]”; NHMUK.

Description

Female

MEASUREMENTS. Body length: 10.7 mm; [antennae partly missing]; forewing length: 8.0 mm; ovipositor length: 9.3 mm.

COLOUR. Black, except: clypeus and mandible extensively dark reddish; maxillo-labial complex and A1–2 dark reddish brown; fore and mid trochanters and femurs, hind tibia and tarsus dark orange; fore and mid tibiae and tarsi (pretarsus darker) orange; coxae, hind trochanter and femur dark reddish; wings hyaline, forewing slightly infuscate at extreme apex, with weak irregular dark marks on basal cell and between subbasal and subdiscal 1 cells, and very wide subquadrate substigmal light brown spot; S1–3 and sides of T2 dark reddish brown; valvula 3 of ovipositor dark brown; setae: goldish on mandible, whitish otherwise (Figs 4, 6A, E).

HEAD. Cuticle shiny; vertex with mixed fine to coarse, deep and dense punctures (distance between punctures $2.0 \times$ puncture diameter); frons with coarse, deep and very dense punctures (distance between punctures $0.2–0.5 \times$ puncture diameter), punctures moderately coarse on upper frons; clypeus with moderately coarse to coarse, deep and very dense punctures (distance between punctures $0.5 \times$ puncture diameter); gena with fine to moderately coarse, deep and dense punctures (distance between punctures $2.0–2.5 \times$ puncture diameter); malar area coarse, deep and very dense punctures (distance

between punctures $0.2\text{--}0.5 \times$ puncture diameter); head width/length: 1.3 (Fig. 5A); malar distance/eye height: 0.3; gena, from above, well developed (gena length/eye length: 0.9), almost straight, not convergent and rounded posteriorly; lower interocular distance/eye height: 1.2 (Fig. 5B); inner margin of eyes subparallel; eye height/eye width: 1.3 (Fig. 5C); POL:OOL: 0.7; ocellar area width/length: 1.9; occipital margin almost straight; occipital carina moderately broad, lamelliform $0.40 \times$ diameter of anterior ocellus; length/width A3: 7.0; length/width A4: 11.7; length/width A5: 10.3; A3/A4: 0.6; A3/A5: 0.7; A4/A5: 1.1; [A14 missing]; setae: erect and scattered on vertex; erect and dense on upper frons; recumbent and dense on lower frons and clypeus; semierect, moderately dense and moderately long on gena (length of setae $0.8 \times$ diameter of anterior ocellus); recumbent and dense on malar area.

MESOSOMA. Elongate, mesosoma length/mesosoma height: 2.1, coarsely sculptured, shiny (Fig. 5D); pronotum areolate rugose, anterior margin straight, without tooth-like processes, with one moderately developed, stout, straight, laterally forward and tooth-like process on each lateroventral margin, posterior margin sharply angulate without process (Figs 5E, 6B); propleuron polished and shiny with coarse, deep and very dense punctures (distance between punctures $0.5 \times$ puncture diameter), punctures coarser dorsally; prescutum triangular, well defined by raised carinae, with narrow base, very weakly concave, transverse-carinate; mesoscutum transverse-carinate; dorsally not prominent, weakly convex, anterior margin (lateral view) widely rounded, not overhanging pronotum; notauli well defined, moderately deep and wide, meeting each other at transscutal articulation; mesoscutellum not prominent, weakly convex, transverse-carinate, carinae strongly curved; mesopleuron areolate-rugose, a narrow part of the anterior subalar area foveolate; metanotum areolate-rugose; propodeum areolate-rugose, anterior margin longitudinally carinate; ventral parts of mesosoma transverse-carinate on anterior third, confused-carinate otherwise; vein 2-rs+m very long (Fig. 6A); coxa I polished-punctate, with coarse, deep and very dense punctures (distance between punctures $0.5 \times$ puncture diameters); coxa II transverse-carinate on dorsal surface, transverse-carinate-punctate on ventral surface, punctures moderately coarse to coarse, deep and moderately dense (distance between punctures $2.0\text{--}3.0 \times$ puncture diameter); hind coxa elongate subcylindrical, length/width: 2.9 (Fig. 6D); hind coxal guide transverse, narrow, notch subterminal, narrow; inner and outer spurs of mid and hind tibiae subequal; hind basitarsus moderately slender, length/width: 9.6; hind basitarsus length $1.2 \times$ tarsomeres 2–5 length (Fig. 6C); tarsal claw with three tooth-like processes; setae: erect, short and scattered to moderately dense dorsally; semi erect to recumbent, moderately long to long and moderately dense to dense (pronotum) on sides and ventral



Fig. 4. *Pristaulacus ninae* sp. nov., holotype, ♀ (NHMUK), habitus, lateral view.

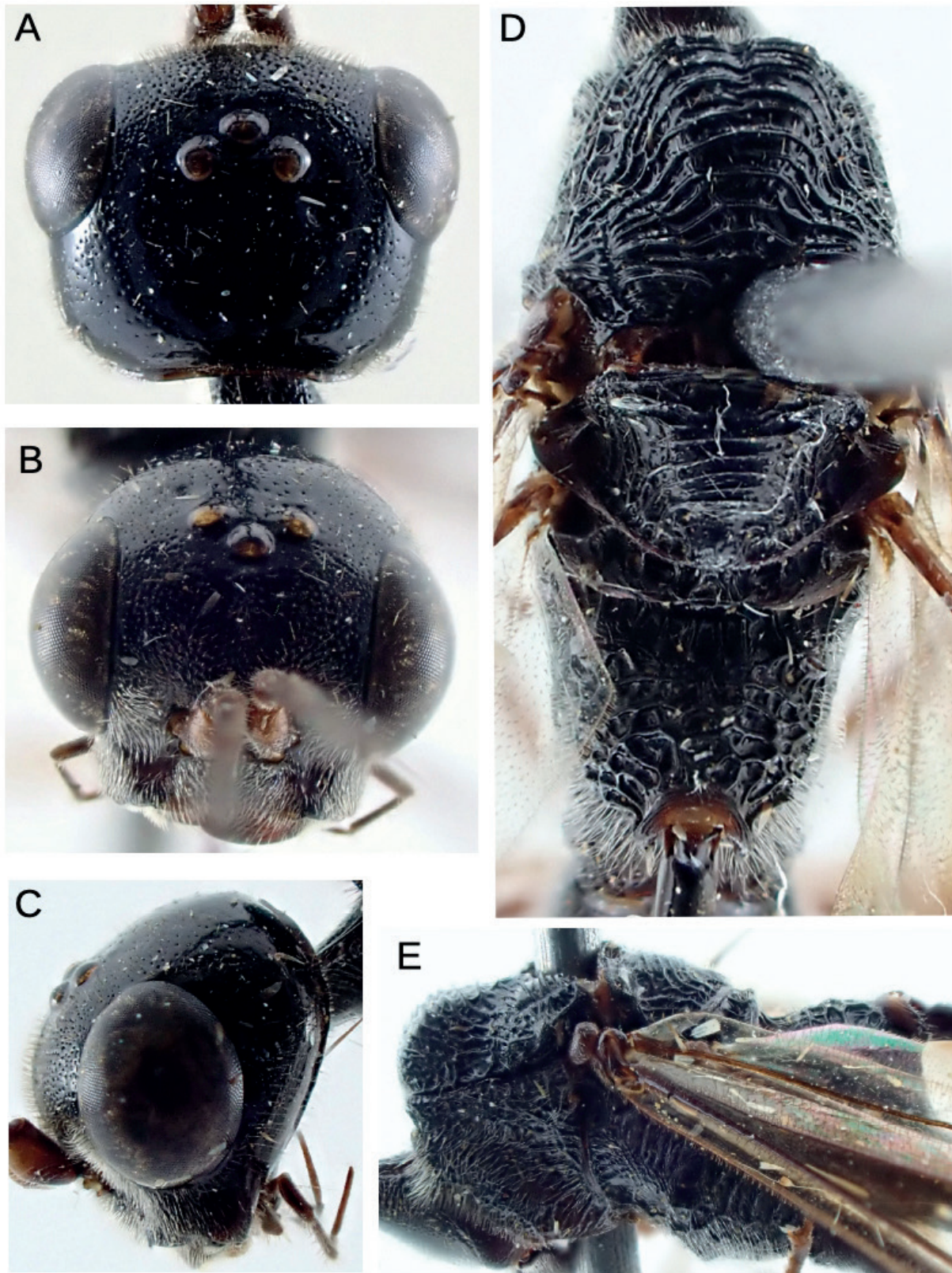


Fig. 5. *Pristaulacus ninae* sp. nov., holotype, ♀ (NHMUK). **A.** Head, dorsal view. **B.** Head, frontal view. **C.** Head, lateral view. **D.** Mesosoma, dorsal view. **E.** Mesosoma, lateral view.

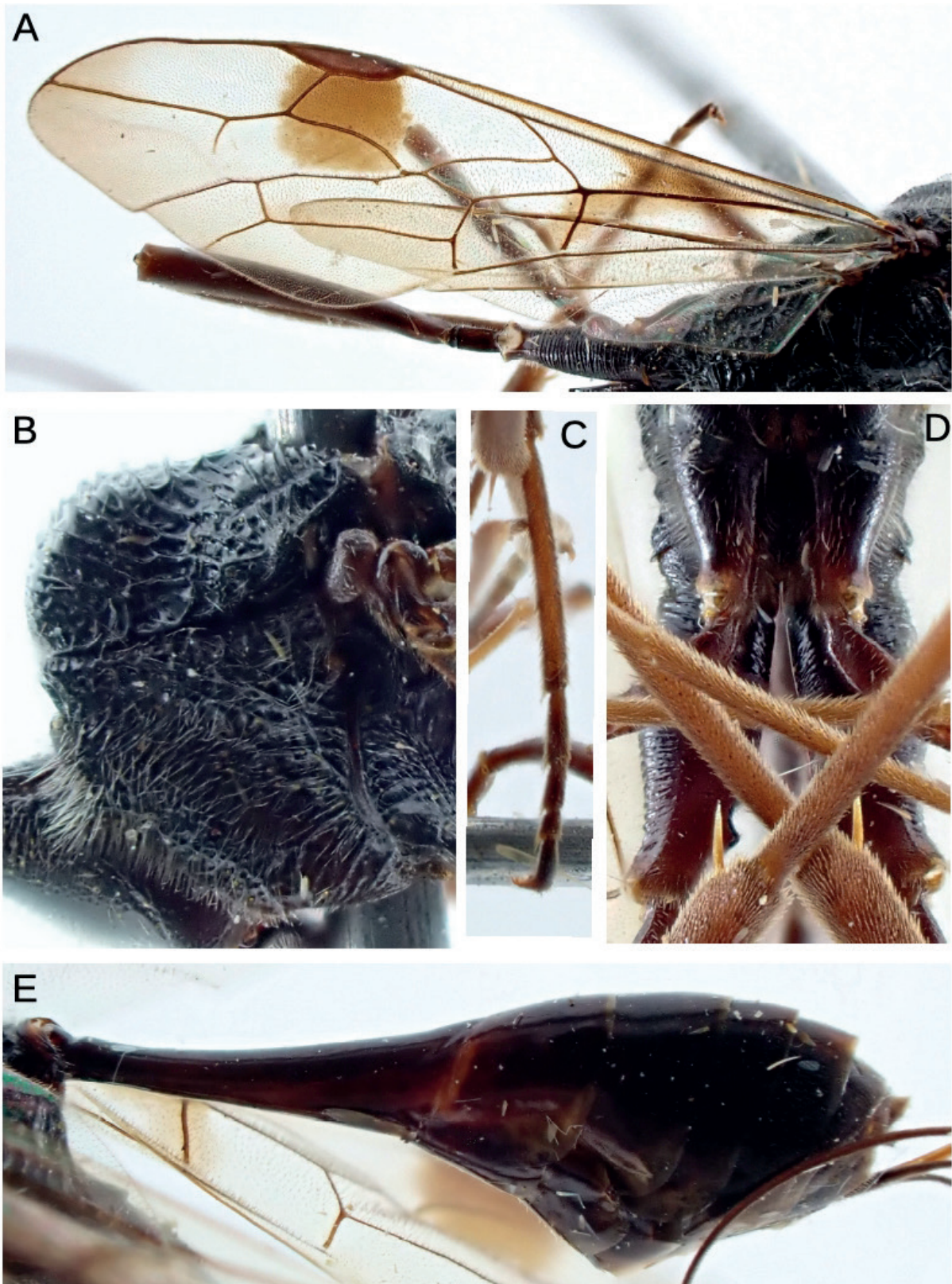


Fig. 6. *Pristaulacus ninae* sp. nov., holotype, ♀ (NHMUK). **A.** Wings. **B.** Pronotum, lateral view. **C.** Hind tarsus. **D.** Hind coxae, ventral view. **E.** Metasoma, lateral view.

surface; erect, long and moderately dense on hind surface of propodeum; erect, long and dense on propleuron (length of setae $0.7 \times$ fore pretarsus).

METASOMA. Pyriform (lateral view), sharply compressed laterally (Fig. 6E); metasoma $1.4 \times$ mesosoma length; petiole elongate, length/width: 3.3; metasoma very finely microsculptured; metasomal segments 1+2 shiny, with very few, sparse, fine, superficial punctures; remaining segments shiny with fine, deep and moderately dense punctures on middle of tergites; S7 shiny with very coarse, elongate, deep and dense punctures; ovipositor $1.2 \times$ forewing length; setae: metasomal segments 1+2 almost glabrous; remaining tergites with recumbent, short and moderately dense setae on the medial part, sides with sparse setae; remaining sternites with semi erect short and moderately dense setae on the medial part, sides with sparse setae.

Male

Unknown.

Distribution

Peninsular Malaysia (Pahang), known from type locality only.

Remarks

Pristaulacus ninae sp. nov. could be placed near to *P. rufobalteatus* Cameron, 1907 (see redescription in Chen *et al.* 2016) for the general appearance, the size and the rounded anterior lobe of the mesoscutum in lateral view. It is easily recognizable for the legs less extensively orange and darker (extensively orange and lighter in *P. rufobalteatus*); shape of the head, with gena straight and weakly convergent posteriorly (regularly rounded and distinctly convergent posteriorly in *P. rufobalteatus*); head with coarse and dense punctures, distance of punctures on frons $0.2\text{--}0.5 \times$ puncture diameter (punctures fine to moderately coarse, distance of punctures on frons $1.0\text{--}1.5 \times$ puncture diameter in *P. rufobalteatus*); POL:OOL: 0.7 and ocellar area width/length: 1.9 (respectively 1.2 and 2.1 in *P. rufobalteatus*); occipital margin almost straight (occipital margin distinctly concave in *P. rufobalteatus*); hind coxa elongate subcylindrical, length/width about 2.9 (hind coxa moderately elongate, length/width about 2.5); tarsal claw with three tooth-like processes (four in *P. rufobalteatus*); ovipositor less than $1.2 \times$ forewing length ($1.3\text{--}1.4 \times$ in *P. rufobalteatus*).

Pristaulacus leviceps Kieffer, 1912 was described as a subspecies of *P. rufobalteatus* but the type material was not found and its taxonomic status is currently uncertain. It is possibly a synonym of *P. rufobalteatus* Cameron, 1907. According to the very poor description by Kieffer (1912), *P. leviceps* and *P. ninae* sp. nov. are clearly separated due to the impunctate head of the former species, whereas the head has coarse and dense to very dense punctures in the latter.

Key to *Pristaulacus* Kieffer, 1900 of Indomalayan area

1. Occipital margin of head without a medial groove at most regularly concave 7
– Occipital margin of head with a more or less developed and shaped medial groove 2
2. Substigmal spot of fore wing small, mainly restricted to anterior third of cell SM1, occasionally overlapping slightly into adjacent cells; base of fore wing hyaline 6
– Substigmal spot of fore wing wide, extending into adjacent cells (M, SM2 and D2), sometimes appearing as a stripe across most of all of fore wing; base of fore wing hyaline or with some dark spots or extensively infuscate 3
3. Metasoma extensively reddish orange
– Metasoma entirely blackish 4

4. Hind tarsus yellowish orange *P. vietnamensis* Turrisi & Smith, 2011
 – Hind tarsus black *P. thailandensis* Turrisi & Smith, 2011
5. Pronotum with setae long and very dense (cuticle not clearly visible beneath)
 *P. gusenleitneri* Turrisi & Smith, 2011
 – Pronotum with setae long and moderately dense (cuticle clearly visible beneath)
 *P. watanabei* Turrisi & Smith, 2011
6. Ovipositor very long, $2.7 \times$ forewing length *P. konishii* Turrisi & Smith, 2011
 – Ovipositor short, $1.1 \times$ forewing length *P. sharkeyi* Turrisi & Smith, 2011
7. Head and mesosoma blackish; mesosoma at least with mesoscutum transverse-carinate 11
 – Head and most or entirely mesosoma reddish or light orange; mesosoma almost entirely areolate-rugose 8
8. Mesosoma entirely light orange 10
 – Mesosoma bicoloured, light orange with propodeum blackish 9
9. Wings uniformly darkly infusate; ovipositor length $1.2-1.4 \times$ forewing length
 *P. erythrocephalus* Cameron, 1905
 – Wings yellowish pigmented with several irregular dark marks basally, under stigma and distally; ovipositor length $1.0 \times$ forewing length *P. exuberans* Turrisi & Smith, 2020
10. Forewing with fasciate blackish-brown pattern: very broad substigmal spot and apex widely infusate (♀); hind legs orange with tarsus blackish (♀); head with gena length less than eye length (gena length/eye length: 0.8) (♀; ♂); ovipositor length $1.4 \times$ forewing length
 *P. luteus* Smith & Turrisi, 2020
 – Forewing without fasciate blackish-brown pattern: only moderately broad substigmal spot (at most also apicoventral margin blackish) (♀); hind legs almost entirely blackish hind legs orange with tarsus blackish (♀); head with gena well developed, length more than eye length (gena length/eye length: 1.1) (♀; ♂); ovipositor length $1.2 \times$ forewing length *P. flavipennis* (Cameron, 1887)
11. Mesonotum (lateral view) sharply acute, overhanging pronotum 22
 – Mesonotum (lateral view) regularly rounded, not overhanging pronotum 12
12. Metasoma blackish, at most basal segments blackish brown 19
 – Metasoma extensively reddish orange 13
13. Mesosoma with long and dense setae obscuring sculpture beneath; head sharply transverse in dorsal view (length/width: 1.4) *P. stigmaticus* (Westwood, 1868)
 – Mesosoma with short and scattered to moderately dense setae, sculpture well visible beneath; head moderately transverse in dorsal view (length/width: 1.2) 14
14. Lateroventral margin of pronotum with two anterior and posterior tooth-like processes on each side, fore wing with basal half extensively infusate and a very broad substigmal dark brown spot *P. leleji* Turrisi & Nobile, 2016
 – Lateroventral margin of pronotum with one anterior tooth-like processes on each side, fore wing with basal half not infusate and a moderately to weak substigmal dark brown spot 15
15. Setae of the body golden throughout; wings yellowish; ovipositor shorter than forewing (ovipositor length / forewing length: 0.9) *P. takakuwai* Turrisi & Watanabe, 2011
 – Setae of the body almost entirely whitish; wings hyaline; ovipositor longer than forewing (ovipositor length /forewing length: 1.1–1.4) 16

16. Ovipositor $1.1 \times$ forewing length *P. matteinii* Turrisi & Smith, 2020
 – Ovipositor $1.3\text{--}1.4 \times$ forewing length 17
17. Occipital carina narrow, rim-like, $0.3 \times$ diameter of an ocellus; metasoma blackish with side of tergites and sternites dark brown *P. perfidus* Turrisi & Smith, 2020
 – Occipital carina moderately broad, lamelliform, $0.5 \times$ diameter of an ocellus; metasoma extensively reddish orange 18
18. Head distinctly narrowing behind eyes; ovipositor $1.3\text{--}1.4 \times$ forewing length
 *P. rufobalteatus* (Cameron, 1907)
 – Head paralleling behind eyes; ovipositor $1.0 \times$ forewing length *P. karinulus* Smith, 2001
19. Pronotum with lateroventral margin bearing two anterior forwarded tooth-like processes on each side; forewing with a fasciate pattern: basally extensively infusate, with brownish spot on cells B (except extreme apex), SB and SD1, a wide subrectangular dark brown substigmal spot and apex widely infusate *P. fasciatipennis* Cameron, 1906
 – Pronotum with lateroventral margin bearing one anterior forwarded tooth-like processes on each side; forewing without a fasciate pattern, only a more or less wide dark brown substigmal spot
 20
20. Hind coxa elongate (length/width: 2.9); hind basitarsus longer than tarsomeres 2–5 combined (length basitarsus/length tarsomeres 2–5: 1.2); tarsal claws with three tooth-like processes *P. ninae* sp. nov.
 – Hind coxa moderately elongate (length/width: 2.0–2.5); hind basitarsus as long as tarsomeres 2–5 combined; tarsal claws with four tooth-like processes 21
21. Antenna length $0.8 \times$ forewing length; legs mostly dark reddish to dark brown, fore and mid tibiae and tarsi reddish orange *P. iuliae* sp. nov.
 – Antenna length $0.6 \times$ forewing length; legs except coxae, hind trochanter, and hind femur dark reddish brown *P. nilgira* Smith & Turrisi, 2020
22. Forewing infusate on proximal half, distal half nearly hyaline; mesonotum with anterolateral lobes weakly projecting forward, projecting upward in lateral view; mesosoma with relatively sparse setae which do not obscure sculpture *P. krombeini* Smith, 1997
 – Forewing almost entirely hyaline with a more or less broad substigmal dark spot; mesonotum with anterolateral lobes sharply projecting forward, not projecting upward in lateral view; mesosoma with dense setae partly obscuring sculpture 23
23. Head widely rounded behind eyes; A1 blackish; pronotum with high, sharp carina close to and paralleling anterior margin; anterolateral lobes of mesonotum prominent, depression in-between very deep; ovipositor longer than forewing *P. singara* Smith & Turrisi, 2020
 – Head more or less strongly narrowing behind eyes; A1 reddish orange; pronotum with high, sharp carina close to and paralleling anterior margin; anterolateral lobes of mesonotum moderately developed, depression in-between shallow: ovipositor length subequal forewing length 24
24. Head width/length: 1.6; mesosoma middle lobe with 10–11 complete cross carinae; substigmal spot very small, about $0.5 \times$ as broad as stigma length, reaching the anterior margin of cell SM2; fore and mid legs reddish orange *P. signatus* (Shuckard, 1841)
 – Head width/length: at most 1.4; mesosoma middle lobe with 5–6 complete cross carinae; substigmal spot very broad, more than or equal stigma length, reaching the posterior margin of cell SM2; fore and mid legs dark brown to blackish 25
25. Head weakly narrowing behind eyes; fore and mid legs blackish *P. nigripes* Kieffer, 1911
 – Head strongly narrowing behind eyes; fore and mid legs dark brownish
 *P. iridipennis* (Cameron, 1900)

Table 1. Checklist of species of *Pristaulacus* Kieffer, 1900 of the Indomalayan area.

species	distribution	references
<i>Pristaulacus erythrocephalus</i> Cameron, 1905	Philippines, Malaysia (Sarawak, Sabah, Pahang)	Cameron (1905); Smith (2001, 2017b); Turrisi (2017)
<i>Pristaulacus exuberans</i> Turrisi & Smith, 2020	Thailand	Turrisi & Smith (2020)
<i>Pristaulacus fasciati pennis</i> Cameron, 1906	Malaysia (Sarawak, Sabah)	Cameron (1906); Smith (2001, 2017b); Turrisi (2017)
<i>Pristaulacus flavipennis</i> (Cameron, 1887)	Sri Lanka	Cameron (1887); Turner (1919b); Smith (1997, 2001, 2017b); Turrisi (2017); Turrisi & Smith (2020)
<i>Pristaulacus gusenleitneri</i> Turrisi & Smith, 2011	Thailand	Turrisi & Smith (2011, 2020)
<i>Pristaulacus iridipennis</i> (Cameron, 1900)	India (Meghalaya), Malaysia (Sabah)	Cameron (1900); Smith (1997, 2001, 2017b); Turrisi (2017)
<i>Pristaulacus iuliae</i> sp. nov.	India (Karnataka)	this paper
<i>Pristaulacus karinulus</i> Smith, 2001	China, Taiwan, India (Sikkim)	Enderlein (1912); Smith (2001); Turrisi (2017); Smith & Turrisi (2020)
<i>Pristaulacus konishii</i> Turrisi & Smith, 2011	Thailand	Turrisi & Smith (2011, 2020)
<i>Pristaulacus krombeini</i> Smith, 1997	Sri Lanka	Smith (1997); Turrisi (2017); Smith & Turrisi (2020)
<i>Pristaulacus leleji</i> Turrisi & Nobile, 2016	Thailand	Turrisi & Nobile (2016) Turrisi & Smith (2020)
<i>Pristaulacus leviceps</i> (Kieffer, 1912)	India (West Bengal)	Kieffer (1912); Smith (2001); Turrisi (2017)
<i>Pristaulacus matteinii</i> Turrisi & Smith, 2020	Thailand	Turrisi & Smith (2020)
<i>Pristaulacus luteus</i> Smith & Turrisi, 2020	India (Tamil Nadu, Kerala)	Smith & Turrisi (2020)
<i>Pristaulacus nigripes</i> Kieffer, 1911	India (Sikkim), Thailand	Kieffer (1911, 1921); Smith (2001); Turrisi (2017); Smith & Turrisi (2020); Turrisi & Smith (2020)
<i>Pristaulacus nilgira</i> Smith & Turrisi, 2020	India (Tamil Nadu)	Smith & Turrisi (2020)
<i>Pristaulacus ninae</i> sp. nov.	Malaysia (Pahang)	this paper
<i>Pristaulacus perfidus</i> Turrisi & Smith, 2020	Thailand	Turrisi & Smith (2020)
<i>Pristaulacus rufobalteatus</i> Cameron, 1907	China, India (Sikkim, Assam), Thailand	Cameron (1907); Smith (2001); Smith & Turrisi (2020); Turrisi & Smith (2020)
<i>Pristaulacus sharkeyi</i> Turrisi & Smith, 2011	Thailand	Turrisi & Smith (2011, 2020)
<i>Pristaulacus signatus</i> (Shuckard, 1841)	Sri Lanka	Shuckard (1841); Smith (1997, 2001); Turrisi (2017); Smith & Turrisi (2020)
<i>Pristaulacus singara</i> Smith & Turrisi, 2020	India (Tamil Nadu)	Smith & Turrisi (2020)
<i>Pristaulacus stigmaticus</i> (Westwood, 1868)	Singapore	Westwood (1868), Smith (2001); Turrisi (2017); Smith & Turrisi (2020)
<i>Pristaulacus takakuwai</i> Turrisi & Watanabe, 2011	Thailand	Turrisi & Watanabe (2011); Turrisi & Smith (2020)
<i>Pristaulacus thailandensis</i> Turrisi & Smith, 2011	Thailand	Turrisi & Smith (2011, 2020)
<i>Pristaulacus vietnamensis</i> Turrisi & Smith, 2011	Thailand	Turrisi & Smith (2011, 2020)
<i>Pristaulacus watanabei</i> Turrisi & Smith, 2011	Thailand	Turrisi & Smith (2011, 2020)

Discussion

The Oriental species of the aulacid genus *Pristaulacus* have not yet been treated in a comprehensive paper, and based on recent catalogues and subsequent additions, it is possible to count a total of 61 species (Turrisi *et al.* 2009; Chen *et al.* 2016; Smith 2017b; Turrisi 2017; Smith & Turrisi 2020; Turrisi & Smith 2020; present study). The Indomalayan area includes 27 species of *Pristaulacus*, which however is largely underestimated based on the high number of undescribed species already recognized (Turrisi, unpubl.). Here, we recognize five species from Malaysia (including Singapore) and twelve from India (including Sri Lanka) (Table 1). The Indomalayan *Pristaulacus* can be separated with the key (*P. leviceps* Kieffer, 1912 is excluded, its status is uncertain, possibly synonym of *P. rufobalteatus* Cameron, 1907).

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