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New species of Oriental Tersilochinae (Hymenoptera: Ichneumonidae), with remarks on sexual dimorphism in the genus *Allophrys* Förster, 1869

Новые виды ориентальных терзилохин (Hymenoptera: Ichneumonidae: Tersilochinae) с замечаниями о половом диморфизме в роде *Allophrys* Förster, 1869

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KEY WORDS: India, Indonesia, new species, taxonomy, parasitoids, sexual dimorphism.
КЛЮЧЕВЫЕ СЛОВА: Индия, Индонезия, новый вид, таксономия, паразитоиды, половой диморфизм.

ABSTRACT. Material of Oriental Tersilochinae (Ichneumonidae) from the insect collection of the Matsuyama University, Japan, was examined. From this material, two species are described as new to science: *Probles* (*Probles*) *lompobattanga* Khalaim, **sp.n.** from North India and *Diaparsis* (*Diaparsis*) *bengalensis* Khalaim, **sp.n.** from Indonesia. *Allophrys miklouhomaclayi* Khalaim et Villemant, 2019 is newly recorded from Indonesia and its ♂ is described for the first time. Unlike other species of *Allophrys* Förster whose ♂♂ have weakly to strongly enlarged compound eyes, the ♂ of *A. miklouhomaclayi* possesses unspecialized (not enlarged) eyes. Colour photographs of the Oriental species *Diaparsis niphadoctona* He, 1995 are given for the first time.

РЕЗЮМЕ. Изучен материал ориентальных терзилохин (Ichneumonidae: Tersilochinae) энтомологической коллекции университета Матсуямы (Япония). На основе этого материала описаны два новых для науки вида: *Probles* (*Probles*) *lompobattanga* **sp.n.** из Северной Индии и *Diaparsis* (*Diaparsis*) *bengalensis* Khalaim, **sp.n.** из Индонезии. Впервые отмечен из Индонезии *Allophrys miklouhomaclayi* Khalaim et Villemant, 2019; также впервые описан самец этого вида. В отличие от других видов *Allophrys* Förster, у самцов которых увеличенные сложные глаза, у самца *A. miklouhomaclayi* глаза неспециализированные, т.е. не увеличенные. Впервые представлены цветные фотографии ориентального вида *Diaparsis niphadoctona* He, 1995.

Introduction

Tersilochinae is a moderately large worldwide subfamily of Darwin wasps (Ichneumonidae) comprising about 600 species in 27 genera [Yu et al., 2016; Khalaim, pers. data]. Townes in his catalogue of the Indo-Australian Ichneumonidae [Townes et al., 1961: 259] recorded only three tersilochine genera with five species. The Oriental species of Tersilochinae were partly reviewed by Khalaim [2011] who described one new genus and 26 species from South, Southeast and East Asia, provided extensive faunistic data and gave keys to genera and species. In the past decade, many new species in the genera *Allophrys* Förster, 1869, *Aneuclis* Förster, 1869, *Barycnemis* Förster, 1869, *Diaparsis* Förster, 1869 and *Probles* Förster, 1869 were described from the Oriental part of China [Sheng et al., 2013; Yue et al., 2017], Vietnam [Khalaim, 2017b, 2018a, b, 2019], Indonesia [Khalaim, 2017a] and Papua New Guinea [Khalaim, Villemant, 2019, 2020, 2021]. Nevertheless, much of the Oriental fauna of Tersilochinae remains understudied and contains many undescribed taxa.

The aim of this work is to describe two new species from the Oriental region, and provide remarks on sexual dimorphism in the genus *Allophrys*.

Material and Methods

Material of Oriental Tersilochinae from the insect collection of Matsuyama University, Ehime Pref., Shikoku,

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Japan (further EUM) was examined. From this material, two undescribed species of the genera *Diaparsis* and *Probles* were recognized, and additional material of two previously known species was found. One paratype is preserved in the Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (further ZISP).

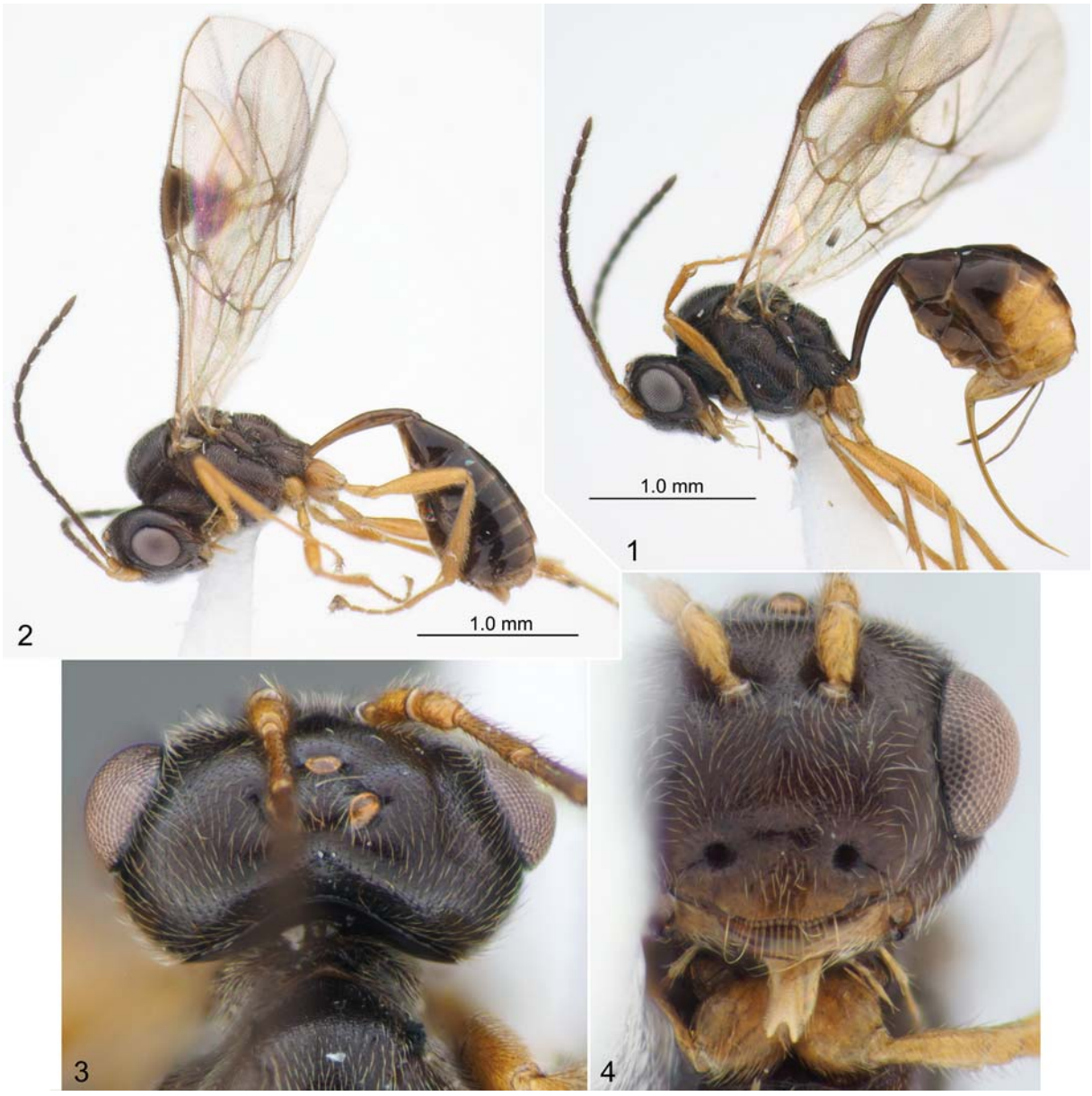
Morphological terminology mainly follows that of Townes [1971] with changes according to Khalaim [2011]. Colour photographs were taken in ZISP with an Olympus OM-D E-M1 digital camera attached to an Olympus SZX10 stereomicroscope, and partially focused images were combined using Helicon Focus Pro (v. 7.6.6) software.

Results

Allophrys miklouhomaclayi Khalaim et Villemant, 2019
Figs 1–6.

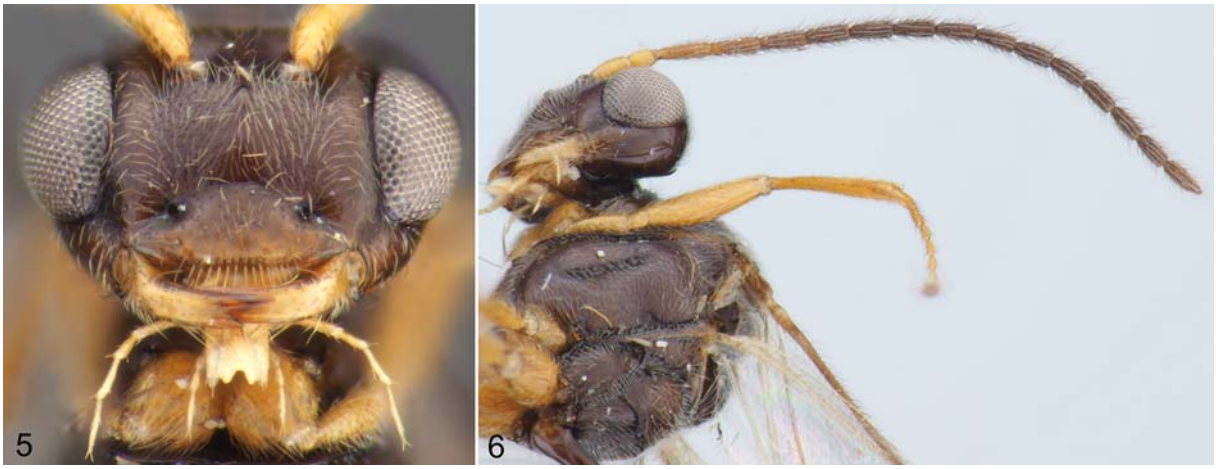
MATERIAL EXAMINED. Indonesia, South Sulawesi, Gowa Prov. [Regency], "Mt. (Gunung) Lompobattang", 5°23′26″S, 119°56′01″E, 2000 m, "5 Malaise traps", 16.I–27.II.2012, coll. K. Takasuka, 4 ♀♀, 1 ♂ (3 ♀♀, 1 ♂ in EUM; 1 ♀ in ZISP).

COMPARISON. *Allophrys miklouhomaclayi* is similar to *A. davichia* Khalaim, 2018 as both have a slender mandible with the upper tooth about 2.5 times longer than the lower tooth (Fig. 5), slender antennal flagellum (Fig. 6), strong foveate groove on the mesopleuron (Fig. 6), and antefurcal second recurrent vein (2*m-cu*) in the fore wing, but distinct in



Figs 1–4. *Allophrys miklouhomaclayi* (Indonesia), ♀ (1) and ♂ (2–4): 1, 2 — habitus, lateral view; 3 — head, dorsal view; 4 — head, front view.

Рис. 1–4. *Allophrys miklouhomaclayi* (Индонезия), ♀ (1) и ♂ (2–4): 1, 2 — габитус, сбоку; 3 — голова, сверху; 4 — голова, спереди.



Figs 5–6. *Allophrys miklouhomaclayi* (Indonesia), ♀: 5 — head, anteroventral view; 6 — head with antenna and mesosoma, posterolateral view.

Рис. 5–6. *Allophrys miklouhomaclayi* (Индонезия), ♀: 5 — голова, спереди и снизу; 6 — голова с антенной и мезосома, сзади и сбоку.

having a longer gena (Fig. 3), occipital carina dorsally complete, narrower foveate groove of the mesopleuron, and long and narrow basal area of the propodeum.

DESCRIPTION. ♂ (first record). Eyes not enlarged (Figs 2–4). Clypeal pits large and deep (Fig. 4). Vertex mediodorsally impressed (Fig. 3). Malar space almost 1.3 times as long as basal mandibular width (longer than in ♀). Metasoma brown (Fig. 2). Otherwise as in ♀.

REMARKS. Unlike known ♂♂ of other *Allophrys* species, which have characteristically distinctly enlarged compound eyes (always much larger than the eyes of ♀♀), and thus with considerable sexual dimorphism in the genus, *A. miklouhomaclayi* possesses unspecialized (i.e. not enlarged) eyes of the ♂. This fact is evidence that this important generic feature of *Allophrys* (enlarged eyes of ♂♂) does not work well in all species, and therefore must be used with caution in generic and species diagnoses. Nevertheless, species of *Allophrys* can be distinguished from those of the close genus *Phradis* Förster, 1869 by the presence of hypostomal carina and usually strongly reclivous nervellus in the hind wing.

VARIATION. One pale ♀ is almost entirely brownish orange.

DISTRIBUTION. Papua New Guinea, Indonesia. First record from Indonesia.

Diaparsis (*Diaparsis*) *niphadoctona* He, 1995
Figs 7–11.

MATERIAL EXAMINED. Laos, Xieng Khouang [Xiangkhouang] Prov., Phou Samsoum, 19°08.663′N, 103°48.083′E, 2157 m, 27.V.2013, coll. T. Mita, 1 ♀ (EUM).

DIAGNOSIS. Head and mesosoma distinctly punctate over smooth or finely granulate background. Head, in dorsal view, strongly rounded posterior to eyes (Fig. 8); gena almost 0.7 times as long as eye width. Antennal flagellum unusually short, with 23–24 flagellomeres (Fig. 10). Clypeus ventrally expanded into a blunt tooth (Figs 9–10). Malar space about as long as basal mandibular width. Notaulus with strong irregular wrinkles on anterolateral side (Fig. 8). Foveate groove of mesopleuron extending from epicnemial carina to base of mid coxa, deep and broad, anteriorly upcurved, with strong transverse wrinkles. Dorsolateral areas of propodeum with irregular wrinkles. Fore wing with second recurrent vein (2*m*-*cu*) postfurcal. First tergite of metasoma slender, smooth, with distinct glymma in posterior 0.5–0.6; petiole round in cross-section centrally. Ovipositor very long (Fig. 7), distinctly sinuate apically (Fig. 11).

DISTRIBUTION. North China (Gansu), Laos.

BIOLOGY. Reared from *Niphades castanea* Chao (Coleoptera: Curculionidae) on Chinese chestnut *Castanea mollissima* Blume (Fagaceae) in China [He, Li, 1995].

Diaparsis (*Diaparsis*) *lompobattanga* Khalaim, **sp.n.**
Figs 12–20.

MATERIAL EXAMINED. Holotype: ♀ (EUM), Indonesia, South Sulawesi, Gowa Prov. [Regency], “Mt. (Gunung) Lompobattang”, 5°23′26″S, 119°56′01″E, 2000 m, “5 Malaise traps”, 16.I–27.II.2012, coll. K. Takasuka. Paratypes. Same data as holotype, 3 ♀♀ (2 in EUM, 1 in ZISP).

COMPARISON. The new species differs from its Oriental and Oceanic congeners by the combination of the clavate antennal flagellum with transverse subapical flagellomeres (Fig. 18), propodeum with long basal keel and broad apical area (Fig. 16), and a long ovipositor with sheath 4.0 times longer than the first tergite (Fig. 12). *Diaparsis lompobattanga* **sp.n.** also possesses subapical finger-shaped structures on the outer surface of flagellomeres 1–5 (Fig. 18), while in most other *Diaparsis* species the two proximal flagellomeres lack finger-shaped structures.

DESCRIPTION. **Female.** Body length 4.0 mm. Fore wing length 3.1 mm.

Head, in dorsal view, roundly constricted posterior to eyes (Fig. 14); gena 0.7 times as long as eye width. Eyes glabrous. Clypeus 2.3 times as broad as long, in front view lenticular (Fig. 13), very weakly convex, separated from face by weak impression, polished and impunctate in lower 0.2–0.3, finely and sparsely punctate on slightly scabrous, nearly smooth background in upper 0.7–0.8. Mandible moderately robust, tapered in basal half; upper tooth almost twice as long as lower. Malar space as long as basal mandibular width. Antennal flagellum clavate apically, with 17 flagellomeres; subbasal flagellomeres 1.2–1.3 times as long as broad, subapical flagellomeres distinctly transverse (Fig. 18); flagellomeres 1–5 with distinct subapical finger-shaped structures on outer surface (Fig. 18). Face with weak, slightly elongate median prominence, and with a small smooth tubercle in upper part of this prominence (Fig. 13). Face, frons and

vertex distinctly granulate, dull, densely punctate (punctures mostly indistinct because of granulation). Gena finely punctate on nearly smooth background. Occipital carina complete. Hypostomal carina absent; lower part of postgena with strong longitudinal striae.

Mesoscutum punctate on distinctly granulate background, dull; punctures on propodeum and periphery of mesopleuron mostly indistinct because of granulation. Notaulus with moderately strong wrinkle on anterolateral side of mesoscutum. Scutellum with lateral longitudinal carinae present at its anterior 0.3. Epicnemial carina with upper end abruptly curved to reach front margin of mesopleuron at level of lower 0.25 of pronotum. Foveate groove very broad, moderately deep, oblique, extending over anterior 0.7 of mesopleuron, with long transverse wrinkles (Fig. 15). Propodeal spiracle separated from pleural carina by 2.0–2.5 times diameter of spiracle (Fig. 15). Propodeum with basal keel present in posterior 0.2–0.3 and missing anteriorly (Fig. 16); basal part of propodeum about 0.9 times as long as apical area; apical area flat, broad, anteriorly widely rounded; apical longitudinal carinae complete, reaching transverse carina anteriorly (Fig. 16).

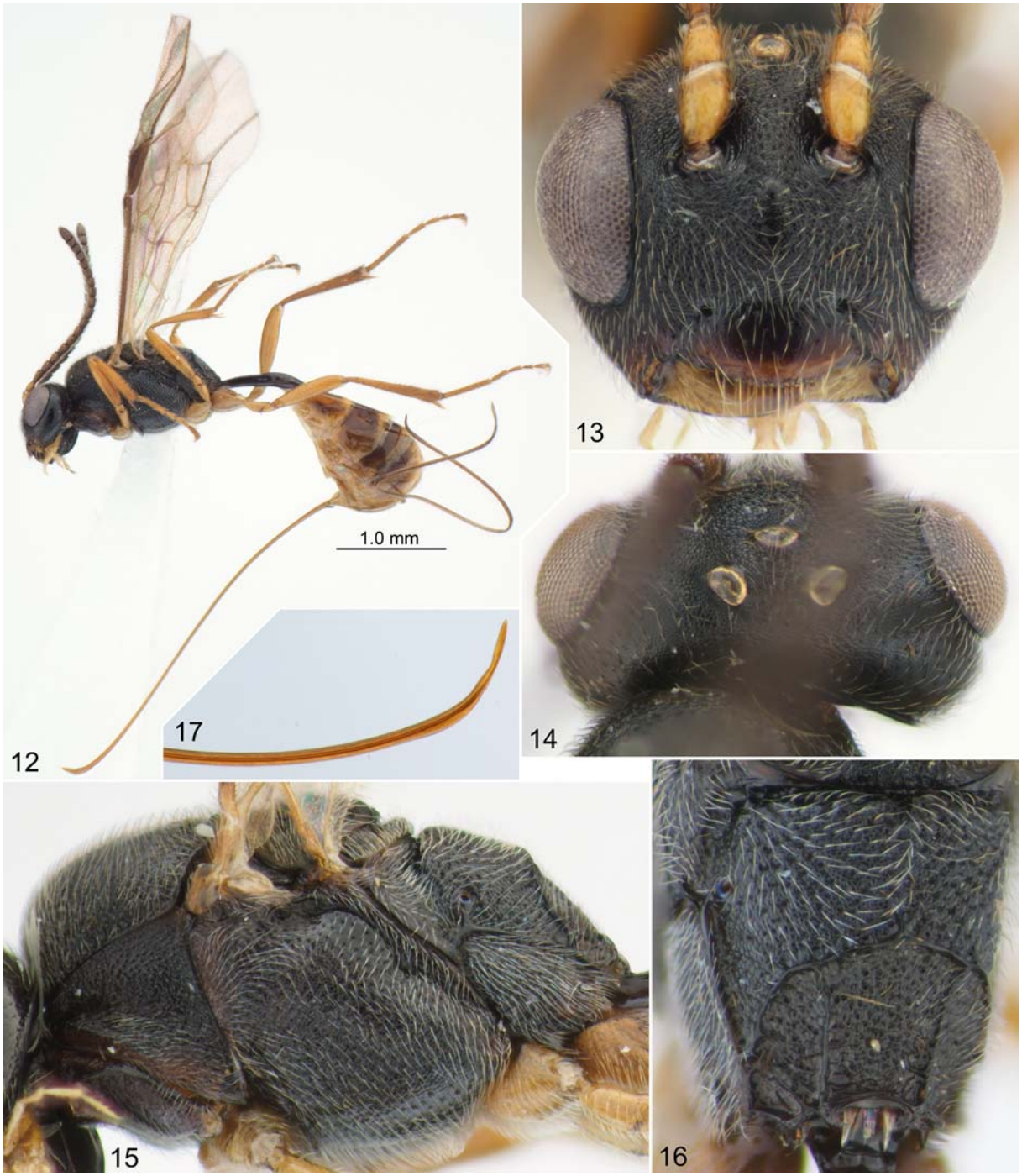
Fore wing with second recurrent vein (2*m*-*cu*) interstitial or weakly postfurcal, with unpigmented bulla anteriorly. Intercubitus (2*rs*-*m*) short, moderately thick. First abscissa of radius (*Rs*+2*r*) straight, much longer than width of pterostig-

Figs 7–11. *Diaparsis niphadoctona* (Laos), ♀: 7 — habitus, lateral view; 8 — head, dorsal view; 9 — head, front view; 10 — head with antenna, antero-ventral view; 11 — apex of ovipositor, lateral view.

Рис. 7–11. *Diaparsis niphadoctona* (Лаос), ♀: 7 — габитус, сбоку; 8 — голова, сверху; 9 — голова, спереди; 10 — голова с антенной, спереди и снизу; 11 — вершина яйцеклада, сбоку.

ma. First and second abscissae of radius (*Rs*+2*r* and *Rs*) meeting at slightly acute angle. Metacarpus (*R*1) almost reaching apex of fore wing. Hind wing with nervellus (*cu*1&*cu-a*) weakly reclivous, slanted about 75° from horizontal. Legs slender. Tarsal claws slender, not pectinate.

First tergite 3.8 times as long as posteriorly broad, entirely smooth, in cross-section centrally more or less trapeziform, petiole slightly flattened dorsally. Glymma isolated, distinct, elongated, situated in anterior 0.45 of tergite (Fig. 20). Second tergite 1.75 times as long as anteriorly broad (Fig. 19). Thyridial depression distinct, about 3.0 times as long as broad, with posterior end rounded (Fig. 19). Ovipositor very long, at apex strongly bent upwards and with a weak dorsal subapical depression (Fig. 17); sheath 4.0 times as long as first tergite (Fig. 12).



Figs 12–17. *Diaparsis lompobattanga* **sp.n.**, ♀, holotype (12–13, 17) and paratype (14–16): 12 — habitus, lateral view; 13 — head, front view; 14 — head, dorsal view; 15 — mesosoma, lateral view; 16 — propodeum, dorsal view; 17 — apex of ovipositor, lateral view.

Рис. 12–17. *Diaparsis lompobattanga* **sp.n.**, ♀, голотип (12–13, 17) и паратип (14–16): 12 — габитус, сбоку; 13 — голова, спереди; 14 — голова, сверху; 15 — мезосома, сбоку; 16 — проподеум, сверху; 17 — вершина яйцеклада, сбоку.

Figs 18–20. *Diaparsis lompobattanga* **sp.n.**, ♀, holotype (18–19) and paratype (20): 18 — antenna, lateral view; 19 — propodeum and base of metasoma, dorsal view; 20 — first mesosomal segment, lateral view.

Рис. 18–20. *Diaparsis lompobattanga* **sp.n.**, ♀, голотип (18–19) и паратип (20): 18 — антенна, сбоку; 19 — проподеум и основание метасомы, сверху; 20 — первый сегмент метасомы, сбоку.

Head and mesosoma black; lower 0.2 of clypeus reddish brown; propleuron sometimes dark reddish brown. Mouthparts yellow. Mandible brownish yellow, teeth dark red. Antenna brown to dark brown, somewhat paler basally; scape and pedicel brownish yellow to yellow-brown. Tegula brownish yellow. Wings slightly infumate with brown. Pterostigma brown. Legs brownish yellow, hind tibia and tarsus (sometimes also fore and mid tarsi) infuscate. First tergite of metasoma brownish black. Metasoma posterior to first tergite predominantly brown, ventrally and on posterior margins of tergites yellowish (Fig. 12).

Male. Unknown.

ETYMOLOGY. Named after the type locality, Mt. Lompobattang.

DISTRIBUTION. Indonesia (Sulawesi).

Probles (*Probles*) *bengalensis* Khalaim, **sp.n.**
Figs 21–28.

MATERIAL. Holotype: ♀ (EUM), India, West Bengal, near Darjeeling, Tiger Hill, over 2600 m, 8.V.1980, coll. S. Hisamatsu.

COMPARISON. The new species belongs to the subgenus *Probles* s. str. as it has the clypeus with a median transverse convexity (Fig. 22) and a long basal part of the propodeum (Fig. 26). *Probles bengalensis* **sp.n.** is similar to the European *P. flavipes* (Szépligeti, 1899) in having an antenna with about 22 flagellomeres, second recurrent vein (2*m-cu*) postfurcal, propodeum with a long basal keel (Fig. 26), and first tergite strongly longitudinally striate (Fig. 24), but differs from this species in having polished dorsolateral areas of the propodeum (Fig. 26) (wrinkled in *P. flavipes*) and a much longer ovipositor, with the sheath 4.0 times as long as the first tergite (Fig. 21) *vs* 2.0 times in *P. flavipes*.

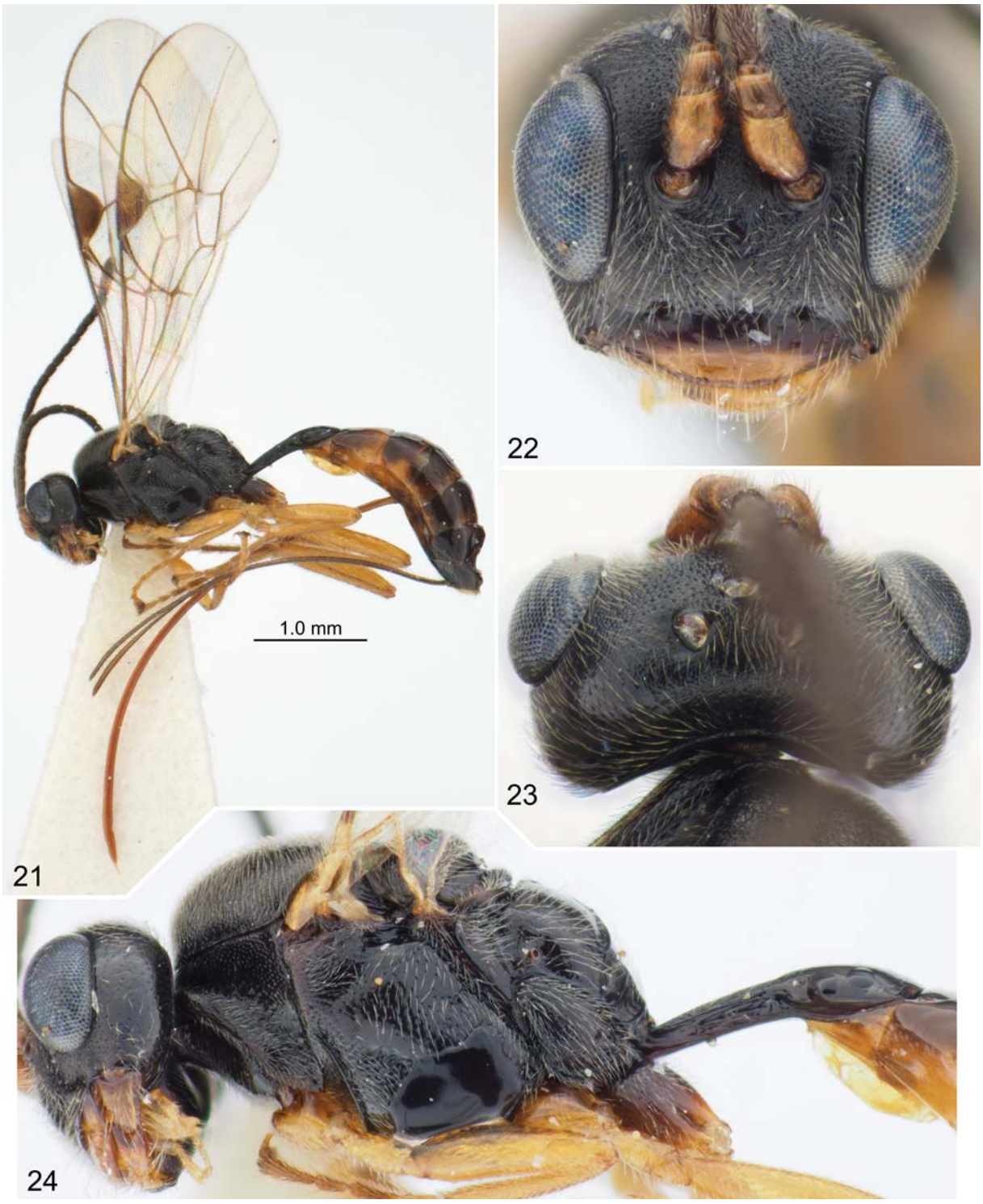
This is the first record of the subgenus *Probles* s. str. from the Oriental region, as it was known hitherto only from the Nearctic and Western Palaearctic regions.

DESCRIPTION. **Female.** Body length 4.8 mm. Fore wing length 3.8 mm.

Head, in dorsal view, roundly constricted posterior to eyes (Fig. 23); gena 0.9 times as long as eye width. Eyes with very short sparse setae (Fig. 22). Clypeus 3.2 times as broad as long, in front view lenticular (Fig. 22), convex in upper part, with distinct transverse concavity in lower part; clypeus separated from face by distinct furrow, polished and impunctate in lower 0.6, finely and sparsely punctate in upper 0.4, with weak granulation near upper margin. Mandible robust, weakly tapered in basal half; upper tooth somewhat longer and broader than lower. Malar space 0.7 times as long as basal mandibular width. Antennal flagellum slightly clavate apically, with 22 flagellomeres; subbasal flagellomeres 1.5–1.6 times as long as broad, median flagellomeres 1.3–1.4 times as long as broad, and subapical flagellomeres as long as broad; flagellomeres 3 to 6 with distinct subapical finger-shaped structures on outer surface (Fig. 25). Face with weak median prominence. Face and frons distinctly granulate, dull, with very indistinct (because of granulation) punctures. Vertex finely punctate, medially finely granulate and dull, laterally nearly smooth and weakly shining. Gena finely punctate on smooth and shining background. Occipital carina complete, arcuate in dorsal view (Fig. 23).

Mesoscutum very finely and densely punctate on finely granulate and dull background, laterally with nearly smooth areas. Notaulus virtually absent, with vestige of wrinkle indicating its path on anterolateral side of mesoscutum (Fig. 25). Scutellum with lateral longitudinal carinae present at its

anterior 0.3. Mesopleuron with fine distinct punctures on polished background (Fig. 24). Epicnemial carina with upper end abruptly curved to reach front margin of mesopleuron. Foveate groove moderately broad, deep, weakly upcurved anteriorly, extending over posterior 0.9 of mesopleuron (thus not reaching epicnemial carina anteriorly), with transverse wrinkles (Fig. 24). Propodeal spiracle separated from pleural carina by almost 2.0 times diameter of spiracle (Fig. 24). Propodeum (Fig. 26) polished, with very fine inconspicuous punctures on dorsolateral areas, with weak basal keel which



Figs 21–24. *Probles bengalensis* **sp.n.**, ♀, holotype: 21 — habitus, lateral view; 22 — head, front view; 23 — head, dorsal view; 24 — head, mesosoma and base of metasoma, lateral view.

Рис. 21–24. *Probles bengalensis* **sp.n.**, ♀, голотип: 21 — габитус, сбоку; 22 — голова, спереди; 23 — голова, сверху; 24 — голова, мезосома и основание метасомы, сбоку.

Figs 25–28. *Probles bengalensis* **sp.n.**, ♀, holotype: 25 — head and bases of antennae, lateral view; 26 — propodeum, dorsal view; 27 — tergites 1–3, dorsal view; 28 — apex of ovipositor, lateral view.

Рис. 25–28. *Probles bengalensis* **sp.n.**, ♀, голотип: 25 — голова и основание антенн, сбоку; 26 — проподеум, сверху; 27 — тергиты 1–3, сверху; 28 — вершина яйцеклада, сбоку.

is indistinct anteriorly because of irregular wrinkles; basal keel about 0.7 times as long as apical area; apical area flat, anteriorly narrowly rounded; apical longitudinal carinae complete, reaching transverse carina anteriorly.

Fore wing (Fig. 21) with second recurrent vein (2*m-cu*) postfurcal, with unpigmented bulla anteriorly. Intercubitus (2*rs-m*) long, slightly thickened, twice longer than abscissa of cubitus between intercubitus and second recurrent vein (abscissa of *M* between 2*rs-m* and 2*m-cu*). First abscissa of radius (*Rs*+2*r*) straight, longer than width of pterostigma. First and second abscissae of radius (*Rs*+2*r* and *Rs*) meeting at right angle. Metacarpus (*R*1) not reaching apex of fore wing. Hind wing with nervellus (*cu*1&*cu-a*) subvertical. Legs slender. Tarsal claws long and slender, not pectinate.

First tergite 2.5 times as long as posteriorly broad, slightly depressed, in cross-section centrally trapeziform; tergite strongly longitudinally striate laterally before glymma (Fig. 24) and dorsally in central part, remainder smooth. Glymma distinct, situated in centre of tergite, joining by furrow to ventral part of postpetiole (Fig. 24). Second tergite 1.15 times as long as anteriorly broad (Fig. 27). Thyridial depression distinct, almost twice as long as broad, with posterior end rounded (Fig. 27). Ovipositor very long, evenly bent upwards, with weak dorsal subapical depression (Fig. 28); sheath 4.0 times as long as first tergite (Fig. 21).

Head, mesosoma and first metasomal tergite black; lower half of clypeus brownish yellow. Mouthparts yellow. Mandible brownish yellow, teeth reddish. Antenna black, scape and pedicel yellow-brown. Tegula yellow. Wings slightly infumate with brown. Pterostigma brown. Legs yellowish brown, hind coxa dark brown. Second tergite yellow-brown; third and following tergites brown to dark brown.

Male. Unknown.

ETYMOLOGY. Named after the region where the holotype was collected.

DISTRIBUTION. North India (West Bengal).

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