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Jürgen Wiesner

Dresdener Ring 11
D-38444 Wolfsburg, Germany

Moe Hnin Phyu

Department of Entomology and Zoology
Yezin Agricultural University
Yezin, Myanmar

Michio Hori

Takajomachi 6-1-2
Wakayama, 640-8135, Japan

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Jürgen Wiesner, Moe Hnin Phyu and Michio Hori
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Three new tiger beetle species of the genus *Prothyma* Hope, 1838, subgenus *Genoprothyma* Rivalier, 1964 (Coleoptera: Cicindelidae) described from Myanmar. 152. Contribution towards the knowledge of the Cicindelidae

Jürgen Wiesner

Dresdener Ring 11
D-38444 Wolfsburg, Germany
juergen.wiesner@wolfsburg.de

Moe Hnin Phyu

Department of Entomology and Zoology
Yezin Agricultural University
Yezin, Myanmar
phyu.moehninphyu@gmail.com

Michio Hori

Takajyomachi 6-1-2
Wakayama, 640-8135, Japan
horimichio@gmail.com

Abstract. *Prothyma* (*Genoprothyma*) *thandamoeae* Wiesner, Phyu and Hori, new species, *Prothyma* (*Genoprothyma*) *sotai* Wiesner, Phyu and Hori, new species, and *Prothyma* (*Genoprothyma*) *asamii* Wiesner, Phyu and Hori, new species (Coleoptera: Cicindelidae) are described from Myanmar. A key to all members of the genus known to occur in Myanmar is given.

Key words. Cicindelini, diagnosis, *thandamoeae*, *sotai*, *asamii*, new species, key to species.

Introduction

Rivalier (1964), in his revision of the genus *Prothyma* Hope, 1838, divided it into four subgenera (*Prothyma* Hope, 1838, *Paraprothyma* Rivalier, 1964, *Genoprothyma* Rivalier, 1964, and *Symplecthyma* Rivalier, 1964), based on the shape of the flagellum in the inner sac of the aedeagus. Members of the first three subgenera occur in Myanmar, the latter is known in the Philippines only. Wiesner (2006: 460) reported seven members of *Prothyma* from Myanmar, two *Prothyma*, two *Paraprothyma* and three *Genoprothyma*. In 2016, 2017 and 2018 Michio Hori, Thanda Moe and Moe Hnin Phyu succeeded in discovering three more species of *Prothyma*, which are new to science. Based on the tubular and short flagellum, they are assigned to the subgenus *Genoprothyma*. These new species are described below, and a key to all *Prothyma* species of Myanmar is presented.

Materials and Methods

All measurements were made using a stereomicroscope. Measurements of body total length were made from the front of the clypeus to the apex of elytra. The label data of type specimens were collated using the following system: in order from pin head to pin point the label data were copied with label lines. Printed white labels and rectangular shape, however, were not explicitly noted. All remaining pertinent data were recorded within brackets.

Specimens mentioned here are deposited in the following collections:

DARM Department of Agricultural Research, Yezin, Myanmar.
JWGC Jürgen Wiesner Collection, Wolfsburg, Germany.
MHWJ Michio Hori Collection, Wakayama, Japan.
OMNS Osaka Museum of Natural History, Osaka, Japan.
YAUM Yezin Agricultural University, Yezin, Myanmar.

Results

Prothyma (Genoprothyma) thandamoeae Wiesner, Phyu and Hori, new species

Fig. 1

Type depository. Holotype male in OMNS, one paratype male and one paratype female each in JWGC and DARM, two paratype males in MHWJ, one paratype male in YAUM.

Type status. Holotype male, *type labels*: “Pyon Village, 10 km W from / Aingyi, Magway Region, / MYANMAR / May 30–31, 2018 / Michio HORI & Thanda Moe leg.”, “HOLOTYPE / *Prothyma (Genoprothyma) / thandamoeae / Wiesner, Phyu & Hori, ded. 2019 [printed, red]*”.

Paratypes: 1 male each with same label in JWGC, and YAUM, and “PARATYPE, *Prothyma (Genoprothyma) / thandamoeae / Wiesner, Phyu & Hori, ded. 2019 [printed, red]*”. 1 female each in JWGC, and YAUM, “5 km W from Aingyi (teak / plantation), Magway Region, / MYANMAR / May 31, 2018 / Michio HORI leg.”, “PARATYPE, *Prothyma (Genoprothyma) / thandamoeae / Wiesner, Phyu & Hori, ded. 2019 [printed, red]*”. 2 males with same labels in MHWJ. 1 male with same labels in DARM.

Distribution. Myanmar (Magway Region).

Etymology. This new species is cordially dedicated to one of its discoverers, Ms. Thanda Moe, Deputy Staff Officer, Perennial Crops Research and Development Center (Mawlamyine), Department of Agriculture, Myanmar.

Diagnosis. Distinguished by the position of the middle setae of the labrum located far away from the margin, and the elytral maculation comprising a triangular or comma-shaped apical dot, which extends towards the elytral apex.

Description. *Size*: Total length (without labrum) 9.2–11.6 mm (mean = 10.2 mm, $n = 8$). *Head*: Shiny coppery, clypeus, frons, genae and short basal part of orbital furrow greenish; surface smooth, glabrous, with two setigerous punctures next to each of the eyes in front and at the center; strong longitudinal striae on frons and orbital plates, irregular and transversely waved on vertex and behind on neck; genae fine longitudinally striated. Ratio of width of head to width of elytra, mean = 0.9. Labrum (male Fig. 2, female Fig. 3) distinctly wider than long, ratio of length to width, mean = 0.6; with four setae, the two middle ones with dark setal pits and located far away from the margin, three-dentate in the middle of front; color testaceous, margin and insertion of median two setae blackish. Mandibles with four teeth, darkened, base yellowish. Labial and maxillary palpi testaceous, the last segment metallic dark greenish; basal segment of labial palpi with long erected white setae. Antennae slender, reaching the elytral third in the males, shorter in the females; antennomeres one to four dark, with metallic luster; scape with one apical seta, the other three antennomeres almost glabrous; antennomeres five to eleven dark brown, dull, finely and evenly pubescent. *Thorax*: Pronotum as wide as long (ratio of length to width, mean = 1.0), sides somewhat rounded between the transversal constrictions; glabrous, transversely waved on disc; color shiny coppery, greenish at the transverse constrictions, bluish at margins; sternae and episternae glabrous, black, with or without coppery or greenish hue; mesepisternum of females with a large pit in the upper half. *Elytra*: (Fig. 4–6) parallel-sided, color shiny coppery above, greenish to bluish at the margin; elytral testaceous maculation consists of a small humeral dot (absent in females), a small marginal dot and a much smaller or nearly extinct central, and a triangular or comma-shaped apical dot, which is extended towards the elytral apex. Surface with dense and evenly spaced punctures,

in rows near the suture; apical border distinctly rounded and restricted towards middle suture, with a tiny sutural spine. Epipleurae black. *Ventral aspect*: Venter glabrous, bluish black, marginally greenish; trochanters glabrous, coxae, femora, tibia and tarsi with white setae; trochanters, apical part of femora (knee) and tibiae testaceous, latter darkened towards apex, remainder shiny metallic greenish. *Aedeagus*: (Fig. 7) on left lateral view voluminous, tapering, with a straight, and pointed apex and two lateral ribs near the apex (total length 2.8mm).

***Prothyma (Genoprothyma) sotai* Wiesner, Phyu and Hori, new species**

Fig. 8

Type depository. Holotype male in OMNS, one paratype male and one paratype female each in JWGC, DARM, and YAUM, four paratype males and two paratype females in MHWJ.

Type status. Holotype male, *type labels*: “Pyon Village, 10 km W from / Ainggyi, Magway Region, / MYANMAR / May 30–31, 2018 / Michio HORI & Thanda Moe leg.”, “HOLOTYPE / *Prothyma (Genoprothyma) / sotai / Wiesner, Phyu & Hori, ded. 2019 [printed, red]*”.

Paratypes: 6 males and 2 females with same label in JWGC, DARM, MHWJ, and YAUM, and “PARATYPE, *Prothyma (Genoprothyma) / sotai / Wiesner, Phyu & Hori, ded. 2019 [printed, red]*”. 1 male and 1 female in MHWJ, one female in JWGC, “Pyon village, near Ainggyi, / 13 miles from Saw, / Magway Region, MYANMAR / June 10, 2017 / M. HORI & M. H. Phyu leg.”, “PARATYPE, *Prothyma (Genoprothyma) / sotai / Wiesner, Phyu & Hori, ded. 2019 [printed, red]*”. 1 female in MHWJ, “Pyon village, near Ainggyi, / 13 miles from Saw, / Magway Region, MYANMAR / June 8, 2015 / M. HORI & Thanda Moe leg.”, “PARATYPE, *Prothyma (Genoprothyma) / sotai / Wiesner, Phyu & Hori, ded. 2019 [printed, red]*”.

Distribution. Myanmar (Magway Region).

Etymology. This new species is cordially dedicated to Prof. Teiji Sota, Kyoto University, Japan.

Diagnosis. Distinguished by the position of the middle setae of the labrum located directly near the margin, and the elytral maculation comprising a marginal dot at mid length of elytra, which is larger than the central dot and apart from it, and a roundish apical dot with apical extension.

Description. *Size*: Total length (without labrum) 9.3–12.2 mm (mean = 10.4 mm, $n = 13$). *Head*: Dark coppery, with greenish reflections; surface smooth, glabrous, with two setigerous punctures next to each of the eyes in front and at the center; strong longitudinal striae on frons and orbital plates, transversely waved on vertex and behind on neck; genae fine longitudinally striated. Ratio of width of head to width of elytra, mean = 0.9. Labrum (male Fig. 9, female Fig. 10) distinctly wider than long, ratio of length to width, mean = 0.7; with four setae located near the margin, setal pits of the same color than remainder of the labrum, with five teeth in front; middle part with three teeth extracted (less in males than in females), and the outer teeth acute angled in males, all three teeth acute angled in females; color testaceous, margin and insertion of median two setae a little darker. Mandibles with four teeth darkened, base yellowish, Labial and maxillary palpi testaceous, the last segment shiny black; basal segment of labial palpi with long erected white setae. Antennae slender, reaching the elytral third in the males, shorter in the females; antennomeres one to four dark, with metallic luster; scape with one apical seta, the other three antennomeres almost glabrous; antennomeres five to eleven dark brown, dull, finely and evenly pubescent. *Thorax*: Pronotum as wide as long (ratio of length to width, mean = 1.0), sides somewhat rounded between the transversal constrictions; glabrous, transversely waved on disc; color shiny dark coppery, greenish at the transverse constrictions, bluish green at margins; sternae and episternae glabrous, coppery or greenish black; mesepisternum of females with a large triangular notch in the upper half. *Elytra*: (Fig. 11–13) parallel-sided, color dark coppery above, greenish to bluish at the margin; elytral testaceous maculation consists of a small humeral dot (absent in females), a small marginal and a much smaller central dot, and a roundish apical dot, which shows a short extension towards the elytral apex. Surface with dense and evenly spaced punctures, in short rows on the disc; apical border distinctly rounded and restricted towards middle suture, with a tiny sutural spine. Epipleurae black. *Ventral aspect*: Venter glabrous, bluish black, marginally greenish; trochanters glabrous, coxae,

femora, tibia and tarsi with white setae; trochanters, apical part of femora (knee) and tibiae testaceous, latter darkened towards apex, remainder shiny metallic greenish. *Aedeagus*: (Fig. 14) on left lateral view slender, with a tiny pointed tip at apex (total length 2.9mm).

***Prothyma (Genoprothyma) asamii* Wiesner, Phyu and Hori, new species**

Fig. 15

Type depository. Holotype male in OMNS, one paratype male and one paratype female each in JWGC, DARM, and YAUM, two paratype males and four paratype females in MHWJ.

Type status. Holotype male, *type labels*: “Shar Dow, 10km SE from / Loikaw, Kayah State, / MYANMAR / May 25–26, 2018 / M. HORI & Thanda Moe leg.”, “HOLOTYPE / *Prothyma (Genoprothyma) / asamii* / Wiesner, Phyu & Hori, ded. 2019 [printed, red]”.

Paratypes: 5 males and 6 females with same label in JWGC, DARM, MHWJ, and YAUM, and “PARATYPE, *Prothyma (Genoprothyma) / asamii* / Wiesner, Phyu & Hori, ded. 2019 [printed, red]”.

Distribution. Myanmar (Kayah State).

Etymology. This new species is cordially dedicated to Prof. Takahiro Asami, Shinshu University, Japan.

Diagnosis. Distinguished by the position of the middle setae of the labrum located directly near the margin, coppery black elytra, and the elytral maculation comprising a marginal dot at mid length of elytra, which is larger than the central dot and apart from it, and a small apical dot without apical extension.

Description. *Size*: Total length (without labrum) 8.9–10.8 mm (mean = 9.7 mm, $n = 13$). *Head*: Shiny coppery, with greenish reflections at orbital furrows and clypeus, genae bluish black; surface smooth, glabrous, with two setigerous punctures next to each of the eyes in front and at the center; strong longitudinal striae on orbital plates longitudinal waved on frons, vertex and behind on neck; genae fine longitudinally striated. Ratio of width of head to width of elytra, mean = 0.9. Labrum (male Fig. 16, female Fig. 17) distinctly wider than long, ratio of length to width, mean = 0.8; with four setae located near the margin, setal pits of the same color than remainder of the labrum, with five teeth in front; middle part with three teeth extracted (less in males than in females), middle tooth extracted in males and females; color brownish, darker at base in both sexes and darker at apex in females. Mandibles with four teeth darkened, small area of base brownish, Labial and maxillary palpi testaceous, the last segment shiny black; basal segment of labial palpi with long erected white setae. Antennae slender, reaching the elytral third in the males, shorter in the females; antennomeres one to four black, with metallic luster; scape with one apical seta, the other three antennomeres almost glabrous; antennomeres five to eleven black, dull, finely and evenly pubescent. *Thorax*: Pronotum as wide as long (ratio of length to width, mean = 1.0), sides somewhat rounded between the transversal constrictions; glabrous, transversely waved on disc; color shiny coppery, greenish at the transverse constrictions, bluish green at margins; sternae and episternae glabrous, bluish black; mesepisternum of females with a deep triangular impression in the center. *Elytra*: (Fig. 18–20) parallel-sided, color shiny brownish black above, greenish to bluish at the margin; elytral testaceous maculation consists of a small humeral dot (absent in females), a small marginal and a tiny or absent central dot, and a small roundish or triangular apical dot. Surface with dense and evenly spaced punctures, in short rows near the suture; apical border distinctly rounded and restricted towards middle suture, with a tiny sutural spine. Epipleurae black. *Ventral aspect*: Venter glabrous, bluish black, marginally greenish; trochanters glabrous, coxae, femora, tibia and tarsi with white setae; trochanters, apical part of femora (knee) and tibiae brownish, latter darkened towards apex, remainder shiny metallic greenish. *Aedeagus*: (Fig. 21) on left lateral view slender, with a tiny pointed tip at apex (total length 2.6mm).

Provisional key to the *Prothyma* of Myanmar

As the three subgenera of *Prothyma* (*Prothyma* Hope, 1838, *Paraprothyma* Rivalier, 1964, *Genoprothyma* Rivalier, 1964), occurring in Myanmar, can be separated by the structure of the inner sac of the aedeagus only, they were not included in the key.

1. Knee (apical part of femora) testaceous, not the same color as the remainder of the femora **3**
— Femora unicolorated **2**
- 2(1). Legs entirely reddish brown; elytra without yellow maculation
. *Prothyma (Prothyma) scrobiculata* (Wiedemann, 1823)
— Legs entirely black; elytra with yellow maculation
. *Prothyma (Prothyma) wernerii* (Sawada and Wiesner, 1998)
- 3(1). Elytral maculation includes a marginal dot (at mid length of elytra) **5**
— Elytral maculation without marginal dot **4**
- 4(3). Central dot of elytral maculation large and transverse
. *Prothyma (Paraprothyma) reconciliatrix* (Horn, 1900)
— Central dot small and roundish *Prothyma (Genoprothyma) bovieri* (Horn, 1896)
- 5(3). The two middle setae of the labrum with yellow setal pit and located near margin **7**
— The two middle setae of the labrum with dark setal pit and located far from margin **6**
- 6(5). Apical dot of elytral maculation roundish
. *Prothyma (Paraprothyma) schmidtgoebeli schmidtgoebeli* (Horn, 1895)
— Apical dot triangular or comma-shaped, extended towards elytral apex
. *Prothyma (Genoprothyma) thandamoeae* Wiesner, Phyu and Hori, new species
- 7(5). Central dot of elytral maculation similar in size to marginal dot and positioned close to each other
. *Prothyma (Genoprothyma) birmanica* Rivalier, 1964
— Central dot smaller than marginal dot and positioned apart from each other **8**
- 8(7). Apical dot roundish, with apical extension
. *Prothyma (Genoprothyma) sotai* Wiesner, Phyu and Hori, new species
— Apical dot without apical extension. **9**
- 9(8). Ground color of elytra coppery red; apical dot large.
. *Prothyma (Genoprothyma) shancola* Sawada and Wiesner, 1998
— Ground color of elytra coppery black; apical dot small
. *Prothyma (Genoprothyma) asamii* Wiesner, Phyu and Hori, new species

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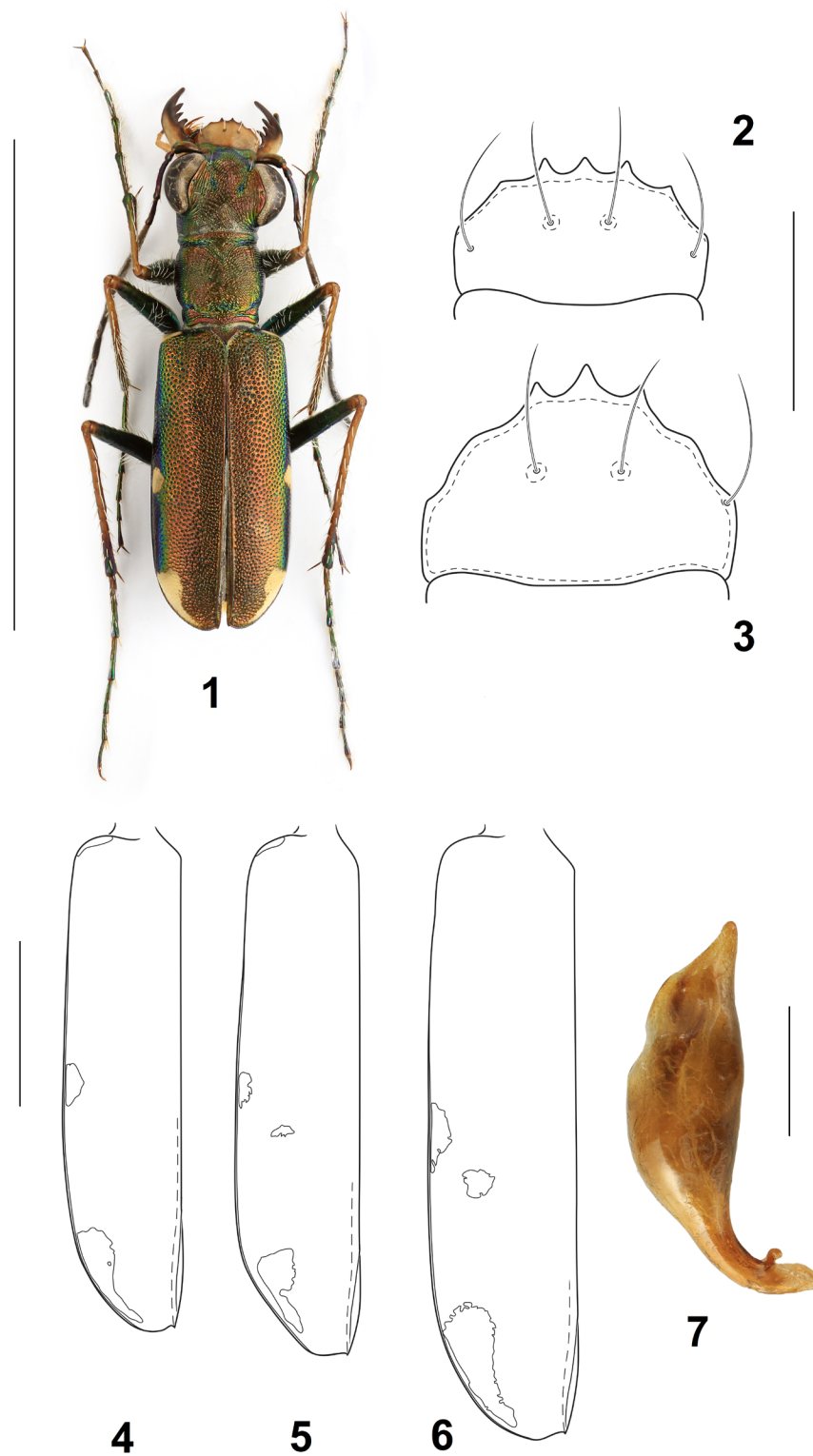
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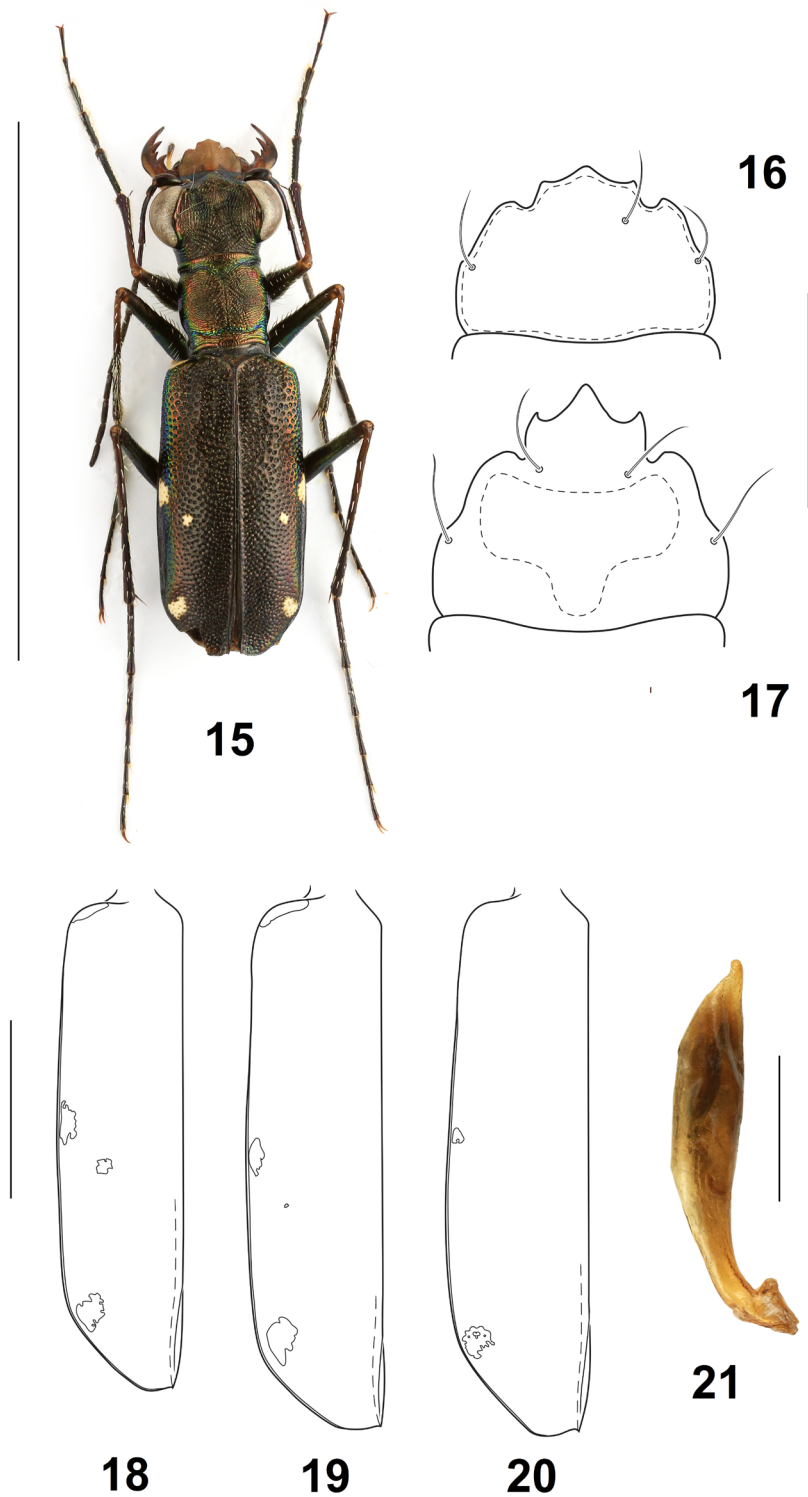
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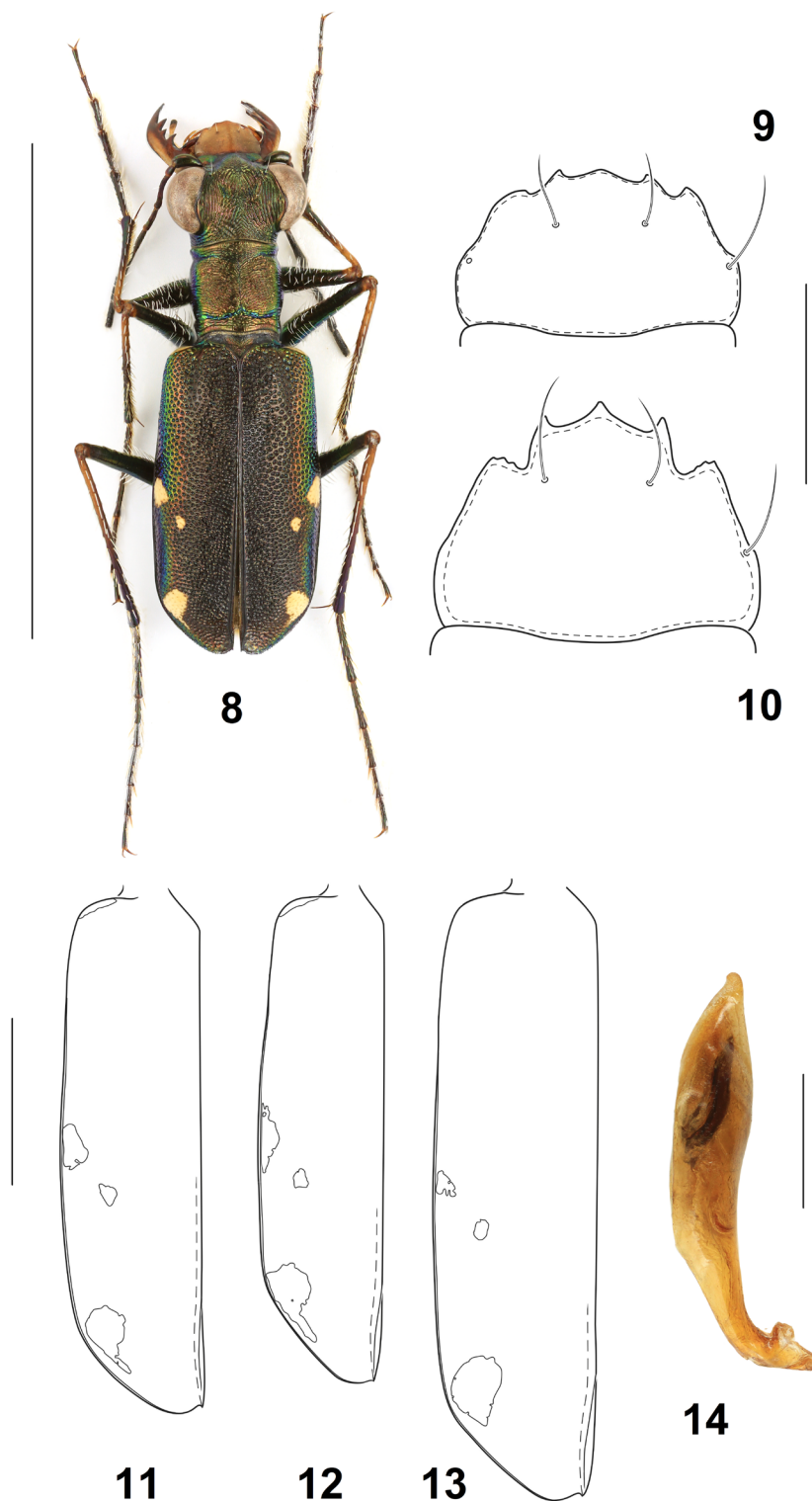
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Figures 1–7. *Prothyma* (*Genoprothyma*) *thandamoee*, n. sp. **1)** Habitus, holotype male, scale = 10 mm. **2–3.** Labrum, scale = 1 mm. **2)** Holotype male. **6)** Paratype female. **4–6.** Left elytron, scale = 2 mm. **2)** Holotype male. **3)** Paratype male. **4)** Paratype female. **7)** Left lateral view of aedeagus, holotype, scale = 1 mm.



Figures 8–14. *Prothyma (Genoprothyma) sotai*, n. sp. **8)** Habitus, holotype male, scale = 10 mm. **9–10.** Labrum, scale = 1 mm. **9)** Holotype male. **10)** Paratype male. **11–13.** Left elytron, scale = 2 mm. **11)** Holotype male. **12)** Paratype female. **13)** Paratype female. **14)** Left lateral view of aedeagus, holotype, scale = 1 mm.



Figures 15–21. *Prothyma* (*Genoprothyma*) *asamii*, n. sp. **15)** Habitus, holotype male, scale = 10 mm. **16–17.** Labrum, scale = 1 mm. **16)** Holotype male. **17)** Paratype female. **18–20.** Left elytron, scale = 2 mm. **18)** Holotype male. **19)** Paratype male. **20)** Paratype female. **21)** Left lateral view of aedeagus, holotype, scale = 1 mm.

