

Five new species of the subtribe Anisolinina (Coleoptera: Staphylinidae: Staphylininae)

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Abstract

Five new species of three genera of the subtribe Anisolinina (Coleoptera: Staphylinidae: Staphylininae) are described: *Hesperosoma* (s.str.) *rufomarginatum* (Vietnam), *H. (Paramichrotus) guizhouense* (China), *H. (Paramichrotus) nigricolle* (Myanmar), *Philomyceta taungmae* (Myanmar) and *Hesperoschema schoenmanni* (China). The aedeagi of all new species are illustrated and habitus photographs of four species are provided. A key to species of *Hesperoschema* SCHEERPELTZ, 1965 is given for the first time.

Key words: Coleoptera, Staphylinidae, Staphylininae, Anisolinina, *Hesperosoma*, *Philomyceta*, *Hesperoschema*, new species, taxonomy.

Introduction

The *Anisolinus* lineage of the tribe Anisolinina is a group of attractive rove beetles with *Hesperus*-like habitus. Several papers have dealt with genera and species of this lineage, constantly adding to the number of known taxa: NAOMI (1982), HAYASHI (1993, 1995, 2002a–c, 2003), SCHILLHAMMER (2004, 2009, 2012, 2014, 2015). The relationship between genera of the subtribe has been discussed by BRUNKE et al. (2017), but this paper mainly deals with the *Tympanophorus* lineage. The vast majority of species, at least in the *Anisolinus* lineage, was described during the past 15 years, the currently known species most likely representing just the tip of the iceberg. In this paper, an additional five species of the genera *Hesperosoma* SCHEERPELTZ, 1965, *Philomyceta* CAMERON 1944 and *Hesperoschema* SCHEERPELTZ, 1965 are described. SCHILLHAMMER (2015) erroneously reinstated the subgenus *Hemihesperosoma* HAYASHI, 2002 of *Hesperosoma*, a mistake that has eventually been corrected by NEWTON (2017). The genus *Hesperoschema*, now containing five species, is keyed for the first time.

Acknowledgements, abbreviations and methods

CNC Canadian National Collection, Ottawa, Canada (A.J. Brunke)

IZ-CAS Institute of Zoology, Chinese Academy of Sciences, Beijing, China (H. Zhou)

NMW Naturhistorisches Museum Wien, Austria

My thanks are due to the curators mentioned above for providing the material used in this paper. I am particularly grateful to Adam Brunke for proof-reading the manuscript, and for the good company in the field during our trips to Myanmar and Vietnam.

The imaging techniques are the same as described in SCHILLHAMMER (2015).

Hesperosoma (s.str.) *rufomarginatum* sp.n.

Holotype ♂: “VIETNAM: Lai Châu Prov., WNW Sa Pa, Tram Ton Pass, Fan Si Pan trail, ca. 1920 m, 22°20'56"N 103°46'30"E, 24.-30.VI.2017, FIT (8a) \ Vietnam expedition 2017 NMW, CNC, H. Schillhammer, R. Schuh, D. Zimmermann, A. Brunke, H. Douglas” (NMW).

DESCRIPTION (Habitus: Fig. 1): 14.5 mm long (7.3 mm, abdomen excluded). Head and pronotum black with dark blue to violaceous hue; scutellum black, elytra black with slight blueish

hue, along scutellum and suture narrowly, shoulders broadly and anterior half of hypomera reddish (Fig. 5), posterior margin narrowly yellowish red; tergites III–V reddish with basal black spot between oblique basal accessory lines, black spot on tergite V almost reaching posterior margin of tergite, tergite VI black, narrowly reddish anteriorly, but reddish part medially interrupted by black color reaching anterior margin, tergite VII black with narrow yellow posterior margin, tergite VIII entirely pale yellow; antennomeres 1–7 black, antennomeres 2 and 3 narrowly reddish at base, antennomeres 8–11 creamy white; mandibles reddish brown, palpi black, segment 3 of maxillary and segment 2 of labial palpi narrowly reddish apically, last segment of both reddish yellow at base and apex; legs red with apices of femora and most of tibiae black, reddish color of tibiae confined to medio-apical fourth or less, tarsi reddish.

Head (Fig. 6) subtrapezoid, 1.28 times as wide as long, tempora almost regularly convex, 1.16 times as long as rather large eyes, dorsal surface moderately coarsely, very densely punctate, punctures contiguous, with inconspicuous indication of an impunctate midline on vertex, clypeus from level of antennal sockets to anterior margin almost impunctate; antennae long and slender, antennomeres 4–6 markedly oblong, 7–9 slightly oblong, 10 about as long as wide; pronotum 1.18 times as long as wide, widest at about level of large antero-lateral seta, narrowed toward base in shallow concave arc, punctation as dense and strong as on head; scutellum uniformly, densely but finely punctate, space between punctures with very fine meshed microsculpture; elytra along sides longer than combined width, densely punctate, punctation appearing slightly asperate, color of pubescence corresponding with the color of integument underneath; abdominal tergites III–V with transverse basal depression and pair of short oblique basal accessory lines, punctation more sparse and rather coarse basally and laterally, area between basal accessory lines almost impunctate on tergite III, remaining parts of tergites III–V finely, uniformly punctate, pubescence black anteriorly, golden yellow in posterior half of tergite III and posterior fourth on IV and V, tergites VI–VIII entirely with fine and uniform punctation and pubescence, punctation on tergite VIII somewhat sparser, with yellow ground pubescence and some scattered, semi-erect black setae; legs long and slender, mesotarsomere 5 as long as 1, about as long as 2–4 combined, metatarsomere 5 slightly longer than 1, as long as 2–4 combined, claws very long, about half the length of tarsomere 5 in meso- and metatarsi.

Male: protarsomeres 1–4 moderately dilated, heart-shaped; sternite VII with the usual setose groove; aedeagus (Fig. 8a–c) very similar to that of the other members of the subgenus.

Female unknown.

DIAGNOSIS: Among the species of the nominal subgenus with partly or largely reddish abdomen (*Hesperosoma malaisei* SCHEERPELTZ, 1965 and *H. chinense* HAYASHI, 2002), *H. rufomarginatum* may be easily recognized by the reddish suture and shoulders of the elytra and the black basal patches on first three visible tergites.

DISTRIBUTION: The species is at present known only from the type locality.

ETYMOLOGY: The specific epithet is derived from a combination of the Latin adjectives rufus, -a, -um (red) and marginatus, -a, -um (bordered) and refers to the reddish suture, shoulders and hypomera of the elytra.

***Hesperosoma (Paramichrotus) guizhouense* sp.n.**

Holotype ♂: “China: NW Guizhou prov., Shizhang Dongda Pubu, 800 m, 28°22'N 105°44'E, Jatua leg., 31.V.2016” (NMW). The holotype is lacking the left mesotarsus and right metatibia and metatarsus.

DESCRIPTION: 12.0 mm long (5.2 mm, abdomen excluded). Head and pronotum black, antennomeres 1–7 black, segment 2 narrowly reddish at base, antennomeres 8–11 creamy white, mandibles reddish brown, segments 1–3 of maxillary palpi black, narrowly reddish distally and pro-

ximally, segment 4 reddish, segments 1 and 2 of labial palpi black, narrowly reddish distally and proximally, segment 3 reddish; elytra reddish, with a large black spot with slight blueish hue, occupying posterior third but not reaching suture and extending to about half of hypomeron, posterior margin of elytra yellowish; abdominal segments III–V reddish, VI black, very narrowly reddish at base, VII black with yellowish band at posterior margin, VIII with yellowish anterior half and black posterior half; legs reddish yellow, femora and tibiae blackened dorsally or dorso-laterally.

Head trapezoid, 1.4 times as wide as long, tempora regularly convex, 1.1 times as long as eyes, dorsal surface moderately coarsely, very densely punctate, punctures contiguous, a narrow band along anterior margin of clypeus impunctate; antennae moderately long, antennomeres 4–6 slightly oblong, 7–8 about as long as wide, 9 and 10 inconspicuously transverse; pronotum 1.13 times as long as wide, widest at about level of large antero-lateral seta, narrowed toward base in shallow concave arc, punctation as dense and strong as on head; scutellum uniformly, moderately coarsely punctate, punctation almost as dense as on head and pronotum; ground pubescence on head, pronotum and scutellum moderately long, yellowish; elytra along sides slightly longer than combined elytral width, densely punctate, punctation appearing slightly asperate, color of pubescence corresponding with the color of integument underneath; abdominal tergites III–V with transverse basal depression and pair of short oblique basal accessory lines, punctation sparser and coarser basally and laterally, remaining parts of tergites III–V finely, uniformly punctate, tergites VI–VIII entirely with fine and uniform punctation and pubescence, except for tergite VI where punctation is somewhat coarser at the very base, color of pubescence corresponding with color of integument underneath; legs long and slender, mesotarsomere 5 as long as 1, about as long as 2–4 combined, metatarsomere 5 slightly longer than 1, as long as 2–4 combined.

Male: elytra with weak indication of a lateral keel in posterior half; protarsomeres 1–4 moderately dilated, heart-shaped; sternite VII with the usual setose groove; aedeagus (Fig. 9a–c) similar to that of *H. klapperichi* SCHILLHAMMER, 2004, but paramere (Fig. 9c) with much deeper medio-apical emargination.

Female unknown.

DIAGNOSIS: Taking into account the variability potential of species of this subgenus, *Hesperosoma guizhouense* does not differ externally from *H. klapperichi* and *H. alexpuchneri* SCHILLHAMMER, 2009.

DISTRIBUTION: The species is at present known only from the type locality.

ETYMOLOGY: The species is named after the Chinese province where the type locality is situated.

Hesperosoma (Paramichrotus) nigricolle sp.n.

Holotype ♂: "MYANMAR: Mandalay Reg., Mogok Township, S Panlin vill., Mt. Taung Mae, west slope, ca. 1780 m \ ca. 22°58'03"N 96°27'22"E, 17.-21.V.2016, leg. Schillhammer, Brunke, Jenkins-Shaw, Jensen, FIT (MBS 213A)" (NMW).

DESCRIPTION (Habitus: Fig. 2): 13.3 mm long (6.3 mm, abdomen excluded). Head, pronotum and scutellum black, the latter with margins very narrowly, obscurely reddish; elytra red, but with small black patch in basal depression, and a large black patch with faint blueish hue, occupying posterior two thirds, continuing onto hypomeron but not reaching ventro-lateral margin, posterior margin and suture narrowly yellowish red; abdomen with segments III–V reddish, VI black with elevated anterior margin narrowly reddish, VII black with posterior margin broadly and anterior margin narrowly yellowish, VIII with proximal half yellowish and

distal half black; antennomeres 1–7 black, antennomeres 2 and 3 narrowly reddish at base, antennomeres 8–11 creamy white; mandibles dark reddish brown; maxillary palpi with segments 1 and 4 pale reddish, distal half of segment 2 and entire segment 3 distinctly darker, black brown; labial palpi with segments 1 and 3 pale reddish, segment 2 black brown; legs reddish to yellowish red, distal halves of femora black, meso- and metatarsomeres 1–4 darker than tibiae.

Head 1.35 times as wide as long, tempora regularly convex, 1.35 times as long as eyes, dorsal surface coarsely and very densely punctate, punctures contiguous, except for clypeus where punctation becoming slightly sparser, ground pubescence extremely short; antennae rather short, antennomeres 4–7 weakly oblong, antennomeres 8–10 about as long as wide; pronotum 1.1 times as long as wide, widest at about level of large antero-lateral seta, narrowed toward base in weak concave arc, punctation as on head, ground pubescence slightly more obvious; scutellum uniformly, densely but finely punctate, punctures rather shallow, space between punctures with very fine wavy microsculpture; elytra along sides a little longer the combined elytral width, densely punctate and pubescent, color of pubescence corresponding with the color of integument underneath; abdominal tergites III–V with transverse basal depression and pair of short oblique basal carinae, punctation very sparse and rather coarse basally and laterally, remaining parts of tergites III–V finely, uniformly punctate, tergites VI–VIII entirely with fine and uniform punctation and pubescence, color of pubescence corresponding with color of integument underneath; legs long and slender, mesotarsomere 5 as long as 1, about as long as 2–4 combined, metatarsomere 5 slightly longer than 1, as long as 2–4 combined.

Male: Elytra with distinct lateral keel in posterior two thirds; protarsomeres 1–4 moderately dilated, heart-shaped; sternite VII with the usual setose groove; aedeagus (Fig. 10a–c) with apex of median lobe broad and rounded (ventral view); paramere (Fig. 10c) with broad apical portion, distinctly bilobed, each lobe bearing a dense cluster of numerous peg setae and four very long normal setae on apical margin.

Female unknown.

DIAGNOSIS: Externally, the species is similar to *Hesperosoma klapperichi*, *H. alexpuchneri* and *H. guizhouense*, but differs by the larger black elytral patch, occupying more than half of the elytral disc. From *H. distinctum* CAMERON, 1932, which has a similarly large elytral patch, it differs by the much shorter, inconspicuous golden pubescence along the suture.

DISTRIBUTION: The species is at present known only from the type locality.

ETYMOLOGY: The specific epithet is a combination of the Latin adjective niger, -a, -um (black) and the noun collum, -i (neck) and refers to the black pronotum.

Philomyceta taungmae sp.n.

Holotype ♂: “MYANMAR: Mandalay Reg., Mogok Township, S Panlin vill., Mt. Taung Mae, west slope, ca. 1780 m \ ca. 22°58'03"N 96°27'22"E, 17.-21.V.2016, leg. Schillhammer, Brunke, Jenkins-Shaw, Jensen, FIT (MBS 213A)” (NMW). – **Paratype** ♀: same label data as holotype (NMW).

DESCRIPTION (Habitus: Fig. 3): 10.4–11.7 mm long (5.9–6.0 mm, abdomen excluded). Head and pronotum black, antennomeres 1–8 black, antennomeres 2 narrowly reddish at base, 9–11 creamy white but antennomere 11 darkened distally; mandibles reddish brown, palpi black with each last segment reddish; elytra black, basal depression black, posterior 4/5 black with slight blueish metallic hue, and with a narrow oblique band obscurely reddish between basal depression and disc of elytra, posterior margin narrowly reddish; abdominal segments III–VII black, with paraterga partly dark reddish to variable extent, segment VIII anterior two thirds yellowish and posterior third black; legs black, tibiae narrowly reddish proximally, protarsi

bright reddish, meso- and metatarsi dark brown to black proximally, becoming more brightly reddish distally.

Head rounded quadrangular, about 1.2 times as wide as long, tempora subparallel immediately behind eyes, then regularly rounded toward neck, eyes small, tempora 1.95 (male) and 1.7 (female) times as long as eyes; dorsal surface coarsely and very densely punctate, punctures contiguous; antennae moderately long, antennomeres 4–8 oblong, 9 and 10 about as long as wide; pronotum 1.14–1.16 times as long as wide, widest at about level of large antero-lateral seta, narrowed toward base in almost straight line, punctuation of dorsal surface as dense and coarse as on head, but punctural grooves often confluent, with margins more elevated, forming longitudinal and oblique rugae; ground pubescence of head and pronotum short, inconspicuous; scutellum densely and coarsely punctate except for base, which is impunctate; elytra along sides about as long as the combined elytral width, each elytron with two blunt but distinct longitudinal costae, one at about midwidth and one sublaterally, punctuation extremely dense, but without punctural grooves, setae of ground pubescence originating from tips of small gibbosities, surface thus distinctly asperate; ground pubescence very obvious along suture; abdominal tergites III–VII with basal transverse depression and an irregular median elevation that is confluent with middle of elevated basal area on tergite VII, tergites III–VI with pair of oblique basal accessory lines, depressions on tergites III–VI impunctate except for a few larger punctures, depression thus appearing rather uneven, depression on tergite VII rather densely and coarsely punctate, remaining portion of tergites and entire tergite VIII densely and finely, uniformly punctate; legs long and slender, meso- and metatarsomere 1 as long as 5, about as long as 2–4 combined, claws of middle and hind legs about half as long as tarsomeres 5.

Male: Protarsomeres 1–4 slightly dilated, heart-shaped; sternite VIII with shallow medio-apical emargination; aedeagus (Fig. 11a–c) similar to that of *P. asperipennis* SCHILLHAMMER, 2012, but with paramere (Fig. 11c) hardly constricted laterally at midlength in ventral view, and apex with only a hardly noticeable notch (markedly notched in *P. asperipennis*).

Female: Protarsomeres 1–4 hardly dilated, rather simple; tergite X (Fig. 7) with apical half well sclerotized and pigmented, with conspicuous medioapical projection.

DIAGNOSIS: Due to the costate elytra and a mediobasal elevation of tergites III–VII, *Philomyzeta taungmae* is related to *P. costata* (FAUVEL, 1895) and *P. asperipennis*. It may be easily distinguished from *P. costata* by the black pronotum and the almost entirely black elytra, from *P. asperipennis*, in addition to the different aedeagus, by the entirely black tergites, with only the paraterga on segments III–V obscurely reddish.

DISTRIBUTION: The species is at present known only from the type locality.

ETYMOLOGY: The specific epithet is the name of the type locality in apposition. Mount Taung Mae is the highest of the mountains surrounding the Mogok valley.

Hesperoschema schoenmanni sp.n.

Holotype ♂: “CHINA, Yunnan prov. Longlin Co., Longjiang, Xiaoheishan, tree and log 24.83671°N 98.76185°E \ 2067 m, 2005.V.28 day Liang H.B., Guo K.J. California Academy & IOZ., Chinese. Acad. Sci. \ IOZ(E) 1771177” (IZ-CAS). – **Paratypes**: 3 exs. with same locality data as holotype, but “IOZ(E) 1771175” (1 ♂, IZ-CAS), “IOZ(E) 1771180” (1 ♂, NMW), “IOZ(E) 1771167” (1 ♀, IZ-CAS).

Additional material: 2 ♀♀: VIETNAM: Lai Châu Prov., Hoang Lien Nat. Park, Tram Ton Pass, Fan Si Pan trail, ca. 22°20'50"N 103°46'30"E, 1900–2000 m, 22.–27.VI.2016, leg. A. Brunke et al. [8d] (CNC, NMW).

DESCRIPTION (Habitus: Fig. 4): 11.1–13.0 mm long (5.7–6.5 mm, abdomen excluded). Head black with faint metallic hue, sometimes obscurely red around antennal sockets; mouthparts reddish to reddish yellow, segments 2 and 3 of maxillary palpi darkened; antennomere 1,

sometimes also 2 dark reddish, 3–6 (or 7) black, 8–11 (rarely 7–11) creamy white, 7 sometimes black proximally, becoming paler off-white distally; pronotum red to yellowish red with variable dark spot in middle, sometimes to the extent that only the margins remain reddish; elytra with posterior two thirds black with slight to distinct violaceous hue, black color extending onto hypomeron and almost reaching lateral margin, anterior third and sutural interval red, posterior margin narrowly yellowish; abdomen with segments III–V reddish, rarely the area between basal carinae darkened on tergite V, VI–VII black, but VII narrowly reddish yellowish at posterior margin, VIII yellow but becoming slightly darker toward posterior margin; legs entirely reddish.

Head trapezoid, 1.45–1.50 times as wide as long in males (about 1.30 times in females), eyes slightly prominent, tempora almost straight for short distance behind eyes, then narrowed toward neck in almost regular arc, about 1.2 times as long as eyes in males, inconspicuously shorter than eyes in females; disc of head with dense and coarse punctation, becoming somewhat sparser on vertex and toward frons; antennae long and slender, antennomeres 4–8 markedly oblong, 9 weakly oblong, 10 about as long as wide; pronotum slightly oblong (ratio 1.05–1.10), widest at about level of large antero-lateral seta, narrowed toward base in very shallow concave arc, densely and coarsely punctate, punctural grooves confluent in places, especially laterally, interstices sometimes forming indistinct longitudinal rugae, with very narrow impunctate midline; surface of head and pronotum between punctures without any microreticulation, shiny; scutellum with rather dense punctation, punctures large but shallow, becoming somewhat finer and sparser posteriad, surface between punctures with microsculpture of very fine transverse waves; elytra along sides about as long as wide, at shoulders distinctly narrower than at posterior margin, densely and coarsely punctate but less coarse than on head and pronotum, color of pubescence corresponding with color of integument underneath; abdominal tergites III–V with transverse basal depression and a pair of short oblique basal accessory lines, punctation very sparse in depressions, punctures shallow, but larger than in posterior half, where punctation is fine and dense, remaining tergites finely and moderately densely punctate; legs long and slender, mesotarsomere 5 as long as 1, about as long as 2–4 combined, metatarsomere 5 slightly longer than 1, as long as 2–4 combined.

Male: Elytra with distinct and sharp, sinuous lateral keel; protarsomeres 1–4 slightly dilated, heart-shaped; sternite VII with flat groove bearing dense and long setae; aedeagus (Fig. 12a–c).

Female: Elytra not keeled; protarsomeres 1–4 female weakly dilated.

DIAGNOSIS: For separation of the species see the key below.

NOTE: The two females from North Vietnam hardly differ from the Chinese specimens, except for slightly smaller body size (9.3–10.2 mm long; 5.4–5.8 mm, abdomen excluded) and a much smaller dark patch on the pronotum. However, without a male to confirm the conspecificity, it seemed best not to include them in the type series.

BIONOMICS: The Chinese specimens have been collected from trees and logs (method unknown), and the Vietnam specimens by fogging a dead mossy fungusy log that was bridging a narrow ravine.

DISTRIBUTION: The species is at present known only from the type locality, but probably also occurs in Vietnam.

ETYMOLOGY: The species is dedicated to the late Heiner Schönmann, who has been a mentor and inspiration since my first visit to the coleoptera section of the NMW in 1984, and a close friend of my family for many years.



Fig. 1: Habitus of *Hesperosoma rufomarginatum*, holotype.



Fig. 2: Habitus of *Hesperosoma nigricolle*, holotype.



Fig. 3: Habitus of *Philomyceta taungmae*, paratype.



Fig. 4: Habitus of *Hesperoschema schoenmanni*, paratype.



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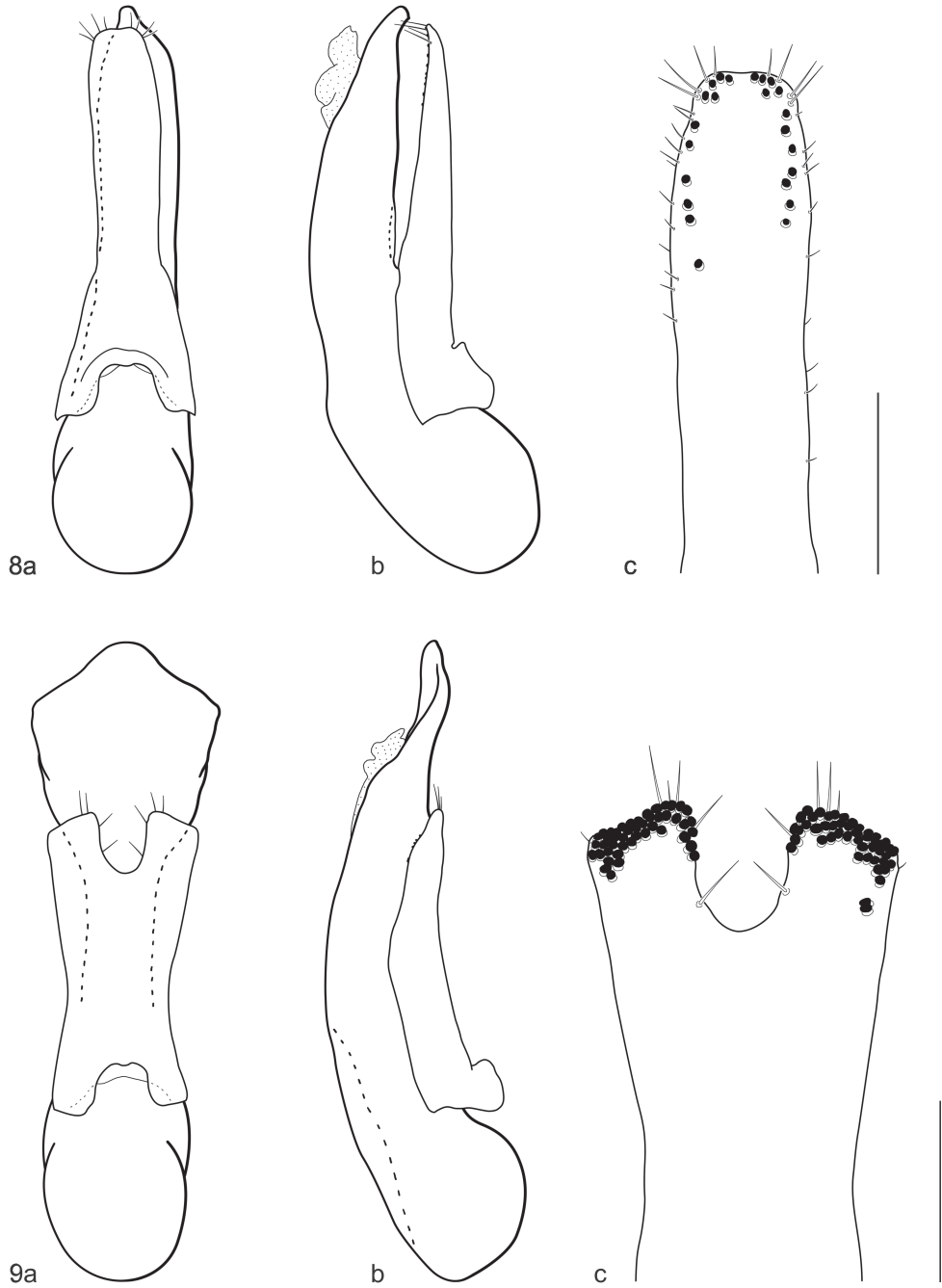


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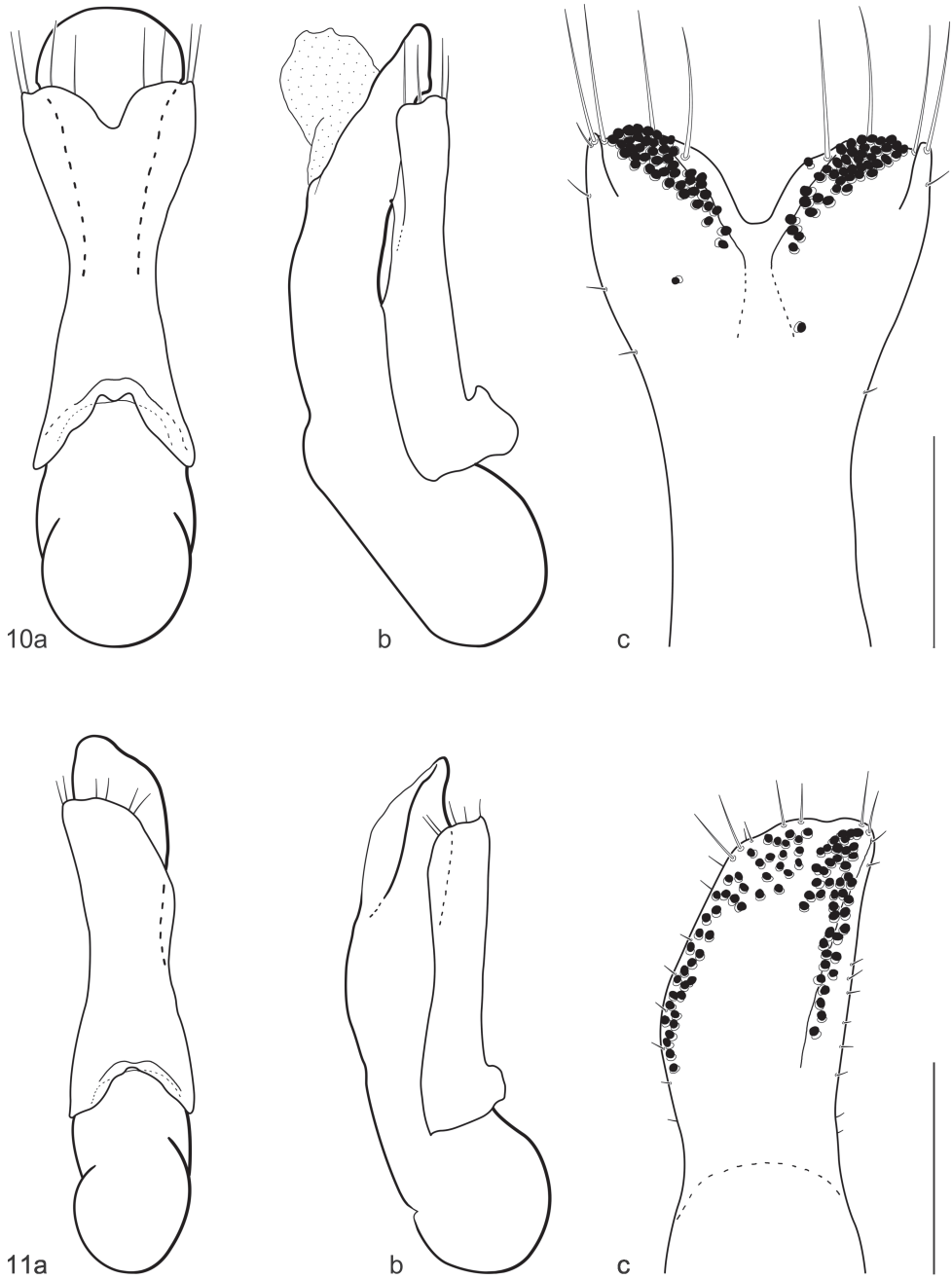


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Figs. 5–7: 5, 6) *Hesperosoma rufomarginatum*, 5) elytra in lateral view, 6) head; 7) *Philomyceta taungmae*, genital segment.



Figs. 8–9: Aedeagus of 8) *Hesperosoma rufomarginatum*; 9) *H. guizhouense*; a) ventral view, b) lateral view, c) paramere. – Scale bar: 0.5 mm (a, b), 0.25 mm (c).



Figs. 10–11: Aedeagus of 10) *Hesperosoma nigricolle*; 11) *Philomyceta taungmae*; a) ventral view, b) lateral view, c) paramere. – Scale bar: 0.5 mm (a, b), 0.25 mm (c).

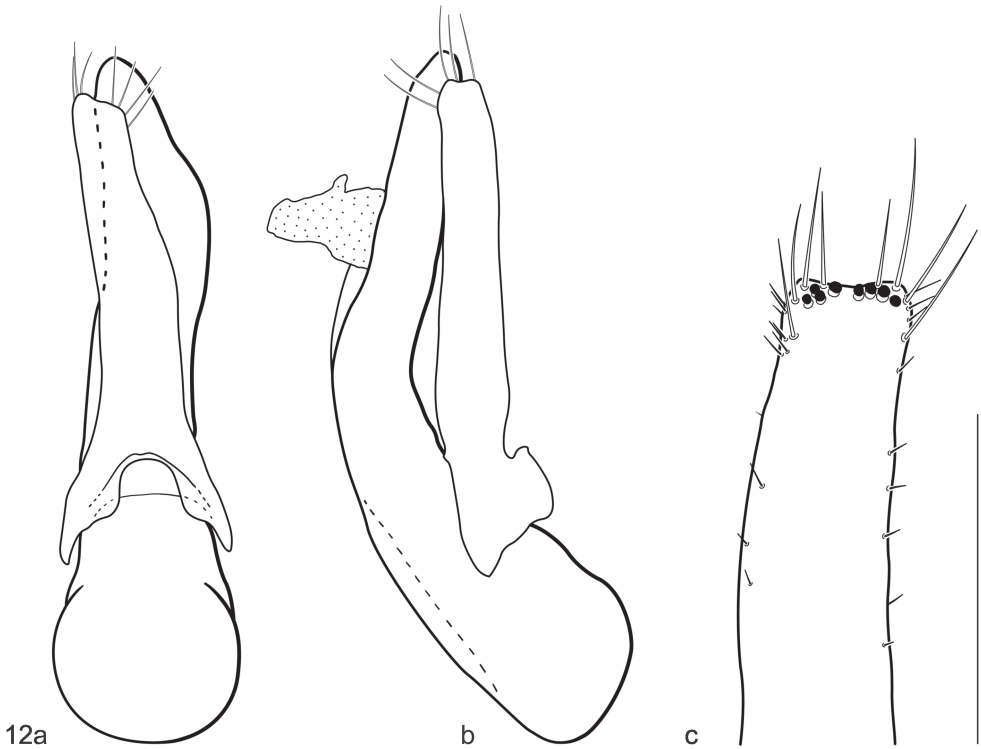


Fig. 12: Aedeagus of *Hesperoschema schoenmanni*; a) ventral view, b) lateral view, c) paramere. – Scale bar: 0.5 mm (a, b), 0.25 mm (c).

Key to the species of *Hesperoschema* SCHEERPELTZ, 1965

- 1 Entire forebody dark, without any reddish or yellowish markings..... 2
- Forebody at least in part reddish, elytra at least obscurely reddish at base, posterior margin narrowly yellowish 4
- 2 Forebody finely punctate, surface between punctures with microreticulation, matt; China (Sichuan)..... *opacum* SCHILLHAMMER, 2009
- Forebody coarsely punctate, surface between punctures without microreticulation, glossy 3
- 3 Head and pronotum metallic violaceous; abdominal segments III–VI reddish; Myanmar (Kachin State)..... *malaisei* SCHEERPELTZ, 1965
- Head and pronotum black to dark metallic olivaceous; abdominal segments III–V dark; Taiwan *sauteri* SCHILLHAMMER, 2004
- 4 Pronotum and abdominal segments III–V dark; distal three antennomeres creamy white; Taiwan *sauteri* (colour variation)
- Pronotum at least partly and abdominal segments III–V reddish; at least distal four antennomeres creamy white 5
- 5 Pronotum and neck entirely and elytra in basal third reddish; distal five antennomeres creamy white; China (Sichuan) *kurbatovi* SCHILLHAMMER, 2004

- Neck black, pronotum with variably extended dark markings, elytra at most in basal fourth reddish; distal four (rarely five) antennomeres creamy white; China (Yunnan).....
 *schoenmanni* sp.n.

Zusammenfassung

Fünf neue Arten aus drei Gattungen der Subtribus Anisolinina werden beschrieben: *Hesperosoma* (s.str.) *rufomarginatum* (Vietnam), *H. (Paramichrotus) guizhouense* (China), *H. (P.) nigricolle* (Myanmar), *Philomyceta taungmae* (Myanmar) und *Hesperoschema schoenmanni* (China). Alle bekannten Arten der Gattung *Hesperoschema* SCHEERPELTZ, 1965 werden zum ersten Mal in einem Bestimmungsschlüssel behandelt.

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