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A review of *Amichrotus* SHARP, 1889 with descriptions of two new species from Taiwan (Coleoptera: Staphylinidae: Staphylininae)

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Abstract

The genus *Amichrotus* SHARP, 1889 (Coleoptera: Staphylinidae: Staphylininae) is reviewed. Two species from Taiwan are new to science: *A. inaequalis* sp.n. and *A. nigripes* sp.n. The aedeagi of all species are illustrated. The habitus of three species and diagnostically important morphological details are depicted by color photographs. A key to species is provided.

Key words: Coleoptera, Staphylinidae, Staphylininae, Staphylinini, Anisolinina, *Amichrotus*, new species, taxonomy, key, zoogeography.

Introduction

The genus *Amichrotus* was described by SHARP (1889) for a single species from Japan, *A. apicipennis* SHARP, 1889. Subsequently, numerous species have been added by various authors, the majority of which turned out to belong to the genus *Hesperosoma* SCHEERPELTZ, 1965 (SCHILLHAMMER 2015). Only two of them, one from Taiwan (*A. formosanus* SHIBATA, 1976) and one from mainland China (*A. watanabei* HAYASHI, 2002) were real *Amichrotus*. So far, *Amichrotus* has been one of the least speciose genera in the *Anisolinus* lineage of the subtribe Anisolinina. In this paper, two new species from Taiwan are added.

Acknowledgement and abbreviations

The material treated in this paper is deposited in the following institutional and private collections. The cooperation and help of the affiliated curators and colleagues is greatly appreciated.

BMNH	Natural History Museum, London, UK (R. Booth, M. Barclay)
CSB	Coll. M. Schülke, Berlin, Germany
CSO	Coll. A. Smetana, deposited in the National Museum of Nature and Science, Toshiba, Japan
CST	Coll. Yasutoshi Shibata, deposited in the National Museum of Nature and Science, Toshiba, Japan
KUM	Kyushu University Museum, Fukuoka, Japan (M. Maruyama)
MHNG	Muséum d'Histoire Naturelle, Genève, Switzerland (G. Cuccodoro)
NMW	Naturhistorisches Museum Wien, Austria
SDEI	Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany (L. Behne, L. Zerche)
TARI	Taiwan Agricultural Research Institute, Taichung, Taiwan (C.F. Lee)

In addition, I thank Adam J. Brunke for carefully proof-reading the manuscript, and thank Yasutoshi Shibata and Michael Schülke for donating duplicate specimens of several species to the NMW.

Amichrotus SHARP, 1889

Amichrotus SHARP 1889: 114; NAOMI 1983: 49.

Typus generis: *Amichrotus apicipennis* SHARP, 1889.

DIAGNOSIS: The genus belongs to the *Anisolinus* lineage of the subtribe Anisolinina, which is characterized by simple labial palpi, as opposed to the *Tympanophorus* lineage with strongly dilated labial palpi. Within the *Anisolinus* lineage, the genus is most closely related to *Anisolinus* SHARP, 1889 and *Hesperoschema* SCHEERPELTZ, 1965 based on the shape of the third segment of the maxillary palpi, which is markedly swollen and densely setose. From these two genera, *Amichrotus* may be separated by the shape of the mandibles: medial margin distinctly emarginate at base, completely exposing the base of the mandibular prostheca (Figs. 7–8) and resulting in a very prominent mandibular dentation. The aedeagus, with a strongly asymmetrically narrowed apex of the median lobe, remotely resembles that of some species of *Philomyceta* CAMERON, 1944.

In addition, it differs from *Anisolinus* in the more trapezoid head and more slender mandibles, and from both *Anisolinus* and *Hesperoschema*, in the more distinctly deflexed sides of the pronotum.

All remaining characters are more or less identical to those of *Anisolinus* and *Hesperoschema*: tergites III–V with deep transverse depression at base and with pair of short, widely separated accessory lines, tergite VI with much shallower basal depression, without accessory lines, but with more or less distinctly bisinuate basal line; legs long and slender, protarsi with segments 1–4 dilated, almost heart-shaped, about as long as wide, last segment about as long as 1–4 combined, not sexually dimorphic; first segment of mid and hind tarsi about as long as 2–4 combined; male sternite VII (Fig. 6) with broad, copiously setose depression, occupying almost entire posterior half of sternite; male sternite VIII (Fig. 4) with deep triangular medio-apical excision, with semi-membranous extension at base of excision occupying most of posterior margin. Male sternite IX (Fig. 5) with asymmetrical basal portion, apex with medial emargination.

SEXUAL DIMORPHISM: Apart from the usual differences in the secondary sexual characters, the only obvious dimorphism occurs in the shape of the mandibles. At base, the female mandible (Fig. 8) is more or less regularly curved and a bit broader, while in the male the base is almost angulate with a more distinct medial emargination (Fig. 7).

List of species

Amichrotus apicipennis SHARP, 1889
Amichrotus formosanus SHIBATA, 1976
Amichrotus inaequalis **sp.n.**
Amichrotus nigripes **sp.n.**
Amichrotus watanabei HAYASHI, 2002

Amichrotus apicipennis SHARP, 1889

Amichrotus apicipennis: SHARP 1889: 115; NAOMI 1983: 51.

TYPE MATERIAL: **Syntype** ♂: "Japan. Amichrotus Amichrotus apicipennis Type D.S." (BMNH).

ADDITIONAL MATERIAL EXAMINED:

J A P A N: 3 exs.: Japan, Lewis (BMNH); SHIKOKU: 1 ♀: Ehime, via Mt. Ishizuchi, 1350 m, 13.VIII.1980, leg. I. Löbl (MHNG); HONSHU: 1 ♂: Gunma, below Usui Pass, 850 m, 24.VII.1980, leg. I. Löbl (MHNG); 1 ♂: Tochigi, Nikko Nat. Park, Ryuzu, 1400 m, 16.VII.1980, leg. I. Löbl (NMW); 1 ♀: Mt. Ōdaigahara, Yamato, 19.VII.1981, leg. K. Ando (SDEI); 1 ♀: Gifu, Miyagawa, Mannami River, 4.XI.1980, leg. S. Saito (NMW); 1 ♂: Mt. Daibosatsu, Hikawarindo, 1600 m, 2.XI.1992, leg. Y. Nakamura (NMW); 1 ♂: Nagano, Ohkuwa, near Kesazawa, 31.X.1980, leg. S. Saito (NMW).

REDESCRIPTION (Habitus: Fig. 1): 11.7–13.5 mm long (6.0–6.8 mm, abdomen excluded). – Black, rather dull; posterior margin of elytra narrowly but well delimited yellow, deflexed portion at base of elytra variably reddish brown and elevated basi-scutellum reddish brown;

abdominal segments III–V black, segment VI black with posterior margin narrowly reddish, segments VII–VIII reddish; mandibles black at base, becoming reddish brown to brownish distad; palpi dark brown to black brown, last segment of maxillary palpi markedly paler than preceding segment; antennae black, two to four (most commonly three) distal antennomeres creamy white, segment 8 usually black but often partly whitish, rarely completely white; legs black, tarsi reddish to reddish brown, first tarsomere of mid and hind legs darker, brown; pubescence of elytra generally black, but golden along suture and posterior margin.

Head (Figs. 10–11) slightly trapezoidal, 1.20–1.25 times as wide as long; tempora narrowed posteriad, 1.5–1.6 (males) or 1.35–1.45 (females) times as long as eyes; dorsal surface slightly convex, rather coarsely and densely punctate, punctures separated by less than a puncture diameter posteriorly, slightly more anteriorly, rarely punctural grooves almost contiguous, with or without a weakly indicated impunctate midline in anterior half of vertex; frontoclypeus impunctate anteriad of about level of posterior margins of antennal grooves; antennae with segments 4–6 (or 4–7) slightly oblong, more distinctly in males, 7–10 (or 8–10) about as long as wide; pronotum 1.10–1.15 times as long as wide, widest at about level of large lateral seta, strongly narrowed posteriad in shallow concave arc; punctation of dorsal surface as dense and coarse as on head, with narrow indistinct indication of an impunctate midline; elytra finely and densely punctate, punctures finer than on head and pronotum, separated by less than a puncture diameter, with distinct, impunctate depression at base, shoulders thus slightly prominent, suture slightly elevated; scutellum rather coarsely but much less densely punctate, surface with fine and dense isodiametrical to transversely meshed microsculpture; abdominal tergites with punctation fine, dense, uniform, except for basal depression, where punctation is coarser and much sparser and lateral portion of tergites III–VI, which is impunctate; generally, fine punctation becoming gradually denser on distal tergites, surface between punctures with exceedingly fine microstriae, causing weak golden iridescence.

Aedeagus (Figs. 16–27) with apical portion of median lobe narrowed into slender stylus, which is bent to the left, apex forming a tiny hook; paramere (Figs. 24–27) variably shaped, with straight or weakly emarginate apical margin.

DISTRIBUTION: The species is known from all four major islands of Japan.

Amichrotus watanabei HAYASHI, 2002

Amichrotus watanabei HAYASHI 2002: 266.

TYPE MATERIAL EXAMINED: **Paratypes**: 1 ♂: "CHINA: Shaanxi 1999, Foping Nat. Res., Panda area, 1600 m, 30°45'N 107°48'E, 6.–11.4.; Siniaev & Plutenko" (CSB); 1 ♀: "CHINA: S-Shaanxi (Qinling Shan), river bank above Houzhenzi, 115 km WSW Xi'an, 1450 m, 30°50'N 107°47'E, leg. M. Schülke [C01-06] \ 5.VII.2001, gravel bank (floating), mixed deciduous forest, moss, mushrooms (sifted) [C01-06]" (NMW).

DIAGNOSIS (complemented by characters mentioned in the original description): 11.5–12.8 mm long (6.3–6.5 mm, abdomen excluded). – The species is almost identical externally to *A. apicipennis* but differs as follows: antennae black with only the last one to three segments reddish; dorsal surface of head (Fig. 12) flatter, head and pronotum with punctation denser, without indication of an impunctate midline; punctation of head anteriorly reaching beyond level of posterior margins of antennal grooves; punctation of scutellum denser and more extensive; elytral golden pubescence also at base and laterally behind shoulders, band of yellow pubescence at posterior margin of elytra slightly narrower; basal depressions of tergites III–V with denser and coarser punctation.

Aedeagus (Figs. 28–30) similar to that of *A. apicipennis*, but smaller; paramere (Fig. 30) with distinctly emarginate apical margin.

DISTRIBUTION: The species is at present known only from Shaanxi Province in China.

Amichrotus inaequalis sp.n.

TYPE MATERIAL: **Holotype** ♂: "TAIWAN: Taichung, Anmashan [locality in Chinese characters], 20.VI.2005, leg. C.-F. Lee" (TARI). – **Paratypes** (2 exs.): 1 ♀: same locality, but 2135 m, creek, 12.V.1992, leg. A. Smetana [T125] (NMW); 1 ♀: same locality, but 2120 m, 13.V.1992, leg. A. Smetana [T128] (CSO).

DESCRIPTION (Habitus: Fig. 2): 10.4–11.8 mm long (5.5–6.0 mm, abdomen excluded). – Black, rather shining, abdominal segments VII–VIII reddish, genital segment reddish yellow; antennae reddish with first segment darkened in distal half, palpi bright reddish, mandibles dark reddish brown; femora black, tibiae and tarsi bright reddish; in general, black colored body parts with slight violaceous blue metallic hue; pubescence and setation black, except for red appendages, where the pubescence is yellowish.

Head (Fig. 13) weakly trapezoidal, 1.22 (female), 1.30 (male) times as wide as long, tempora rounded, 1.5 (female), 1.6 (male) times as long as eyes; posterior half of vertex finely, moderately densely punctate, punctures separated by about a puncture diameter or slightly more, anterior half very sparingly punctate, frontoclypeus (between posterior margin of antennal sockets and anterior margin) impunctate; with moderately distinct, impunctate midline; antennae with segments 4–7 distinctly oblong in male (4–6 in females), segment 8 weakly oblong in male (7 in females), subsequent segments about as long as wide; pronotum 1.08–1.09 times as long as wide, widest at about level of large lateral seta, distinctly narrowed posteriad in concave arc, hind angles rounded but still well marked; surface moderately coarsely and moderately densely punctate, punctures separated by about a puncture diameter, with indistinct impunctate midline in posterior 4/5; elytra (Fig. 9) very uneven, with distinct depression along suture, and broad transverse depression at about midlength, which is confluent with the sutural depression; suture distinctly elevated, portion between shoulders and tip of scutellum as well as portion posteriad of transverse depression also elevated, appearing as irregular swellings; punctation fine and dense, somewhat irregular, punctures separated by 1–2 puncture diameters in transverse direction; scutellum almost impunctate, with very few, very fine, scattered punctures medially, with distinct and dense, transversely meshed to isodiametrical microsculpture; abdomen with transverse basal depressions of tergites III–V almost impunctate, posterior half finely, moderately densely punctate, punctation of remaining tergites more uniform; surface slightly to more distinctly iridescent due to transverse microstriae.

Aedeagus: Figs. 37–39.

DIAGNOSIS: The species may be easily recognized by the uneven elytral surface and the slightly blueish to violaceous hue of the forebody.

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

Amichrotus formosanus SHIBATA, 1976

Amichrotus formosanus SHIBATA 1976: 12.

MATERIAL EXAMINED:

T A I W A N: NANTOU: 1 ♂: near Tsuifeng ["Tsiufeng" on the label], 2200 m, 21.VIII.1976, leg. Y. Shibata (CST); 1 ♀: same, but 22.VIII.1976 (NMW); 1 ♀: Meifeng, 2130 m, 12.V.1991, leg. A. Smetana [T78] (CSO).

REDESCRIPTION: 11.2–11.8 mm long (6.0–6.2 mm, abdomen excluded). – Black, moderately shining; abdominal segments VII–X bright reddish, palpi reddish yellow, antennae reddish to brownish red, 1st segment slightly darkened in distal 2/3, tibiae and tarsi bright reddish, femora dark brown; pubescence of elytra black, more rust red along posterior margin and along sides.

Head (Fig. 14) slightly trapezoidal, 1.25–1.32 times as wide as long, in males on average slightly wider than in females, tempora almost regularly rounded, rarely almost straight behind eyes, 1.33–1.37 (females) to 1.5 (male) times as long as eyes; dorsal surface densely punctate, punctures separated by slightly less than a puncture diameter, becoming clearly less dense between midlength of eyes and posterior margin of antennal grooves, frontoclypeus between posterior margin of antennal grooves and anterior margin of head impunctate, with impunctate midline along entire length of head that may become somewhat indistinct in posterior half of head; antennae with segments 4–6 slightly oblong, subsequent segments about as long as wide; pronotum 1.1 times as long as wide, widest at about level of large lateral seta, strongly narrowed posteriad in concave arc, hind angles weakly indicated; surface moderately coarsely and moderately densely punctate, punctures separated by about a puncture diameter, sometimes with a slightly less densely punctate area at about midlength next to impunctate midline, the latter distinct along entire length of pronotum; surface between punctures on head and pronotum shining; elytra rather finely and densely punctate, punctures separated by less than a puncture diameter in transverse direction; suture distinctly elevated; with a moderately deep, longitudinal depression along suture, in addition, sometimes with a very shallow depression more laterally, impunctate depression at base of elytra less distinct than in *A. apicipennis*, shoulders thus less prominent; scutellum with only a few (ca. 10) rather fine punctures in central area, surface with fine and dense, transversely meshed to isodiametrical microsculpture; abdomen as in *A. apicipennis*, punctures very fine and dense, except for basal depressions, where the punctation is a bit coarser and very sparse, antero-lateral portion of tergites III–VI impunctate; surface of tergites slightly iridescent due to exceedingly fine microstriae.

Aedeagus (Figs. 31–33) with constriction of apical portion of median lobe less distinct than in *A. apicipennis*, apex with very inconspicuous indication of a tiny hook; paramere (Fig. 33) with quite distinctly emarginate apical margin.

DIAGNOSIS: Among the Taiwanese species, it is recognized by the dense punctation of the forebody and the reddish tibiae.

DISTRIBUTION: The species is at present known only from Nantou County on the island of Taiwan.

Amichrotus nigripes sp.n.

TYPE MATERIAL: **Holotype** ♂: "TAIWAN, Kaohsiung Hsien, Peinantashan trail, 2390–2490 m, 5.VII.1993, A. Smetana [T138]" (CSO). – **Paratypes** (3 exs.): 1 ♀: same data as holotype (NMW); 1 ♀: same data as holotype, but 2020 m, 7.VII.1993, A. Smetana [T143] (NMW); 1 ♀: "TAIWAN, Kaohsiung Hsien, Kuanshan trail above Kaunshanchi [probably should read Kuanshanchi] riv., 2550 m, 22.VII.93, A. Smetana [T160]" (CSO).

DIAGNOSIS (Habitus: Fig. 3): The species is almost identical to *A. formosanus* and mostly differs in slightly denser punctation of the head (Fig. 15), particularly in posterior half, darker antennae with at least segments 1–6 (rarely 1–8) dark brown to rarely blackish, and the black tibiae.

Measurements: 11.1–13.1 mm long (5.9–6.3 mm, abdomen excluded), head 1.24–1.32 times as wide as long, tempora 1.30–1.45 times as long as eyes in females, 1.53 in the single male specimen available, pronotum 1.08–1.11 times as long as wide.

Aedeagus (Figs. 34–36) very similar to that of *A. formosanus*, but with slightly broader apical half of median lobe with slightly differently shaped apex; paramere (Fig. 36) with apical margin very indistinctly emarginate.

REMARKS: The strong similarity of this species with *A. formosanus*, in combination with the variability of *A. apicipennis*, raises the question of whether this is a good species or just a sub-

species or even a variety of *A. formosanus* (see also the following unnamed female). However, in *A. apicipennis* the variability was observed mostly in the shape of the paramere, while the external characters are quite constant. The only exception is the number of white distal antennal segments, which has proven to be a variable character in many other genera of Staphylinidae. The species has been tentatively described as new here, but a larger material from additional localities might prove otherwise. Currently, the known distributional areas on the island of the two species are quite far apart.

DISTRIBUTION: The species is at present known only from Kaohsiung province on the island of Taiwan.

Amichrotus sp.

MATERIAL EXAMINED:
T A I W A N: 1 ♀: "Lalashan (2000 m), Taoyuan, Taiwan, 17.–18.XI.2000, H. Sugaya leg." (KUM).

The specimen hardly differs from *A. nigripes*, but is distinctly larger and generally darker. Since the locality lies in the far north of Taiwan – as opposed to the distribution of *A. nigripes* in the far south – it has not been included in the type series of the latter. It might well belong to yet another undescribed species (see also "Remarks" above). A male specimen is required to correctly judge its status.

Measurements: 14.5 mm long (6.8 mm, abdomen excluded), head 1.3 times as wide as long, tempora 1.4 times as long as eyes, pronotum 1.08 times as long as wide.

Key to the species of *Amichrotus*

1	Posterior margin of elytra with narrow, well delimited yellow band	2
–	Elytra unicolorous	3
2	Antennae with 2–4 distal segments creamy white; Japan	*apicipennis*
–	Antennae with 1–3 distal segments reddish; China (Shaanxi)	*watanabei*
3	Dorsal surface of head between eyes almost impunctate; elytra very uneven, with distinct depression along suture and broad transverse depression at midlength; forebody with slight metallic blueish to violaceous hue; Taiwan	*inaequalis*
–	Dorsal surface of head between eyes rather densely punctate; elytra almost even, depression along suture weak, transverse depression at midlength either very indistinct or lacking; forebody black, without metallic hue	4
4	Tibiae and tarsi reddish, markedly brighter than femora; antennae reddish; Taiwan	*formosanus*
–	Only tarsi reddish, tibiae and femora concolorous, dark brown to black; antennae with segments 1–6 (rarely 1–8) darkened; Taiwan	*nigripes*

Zusammenfassung

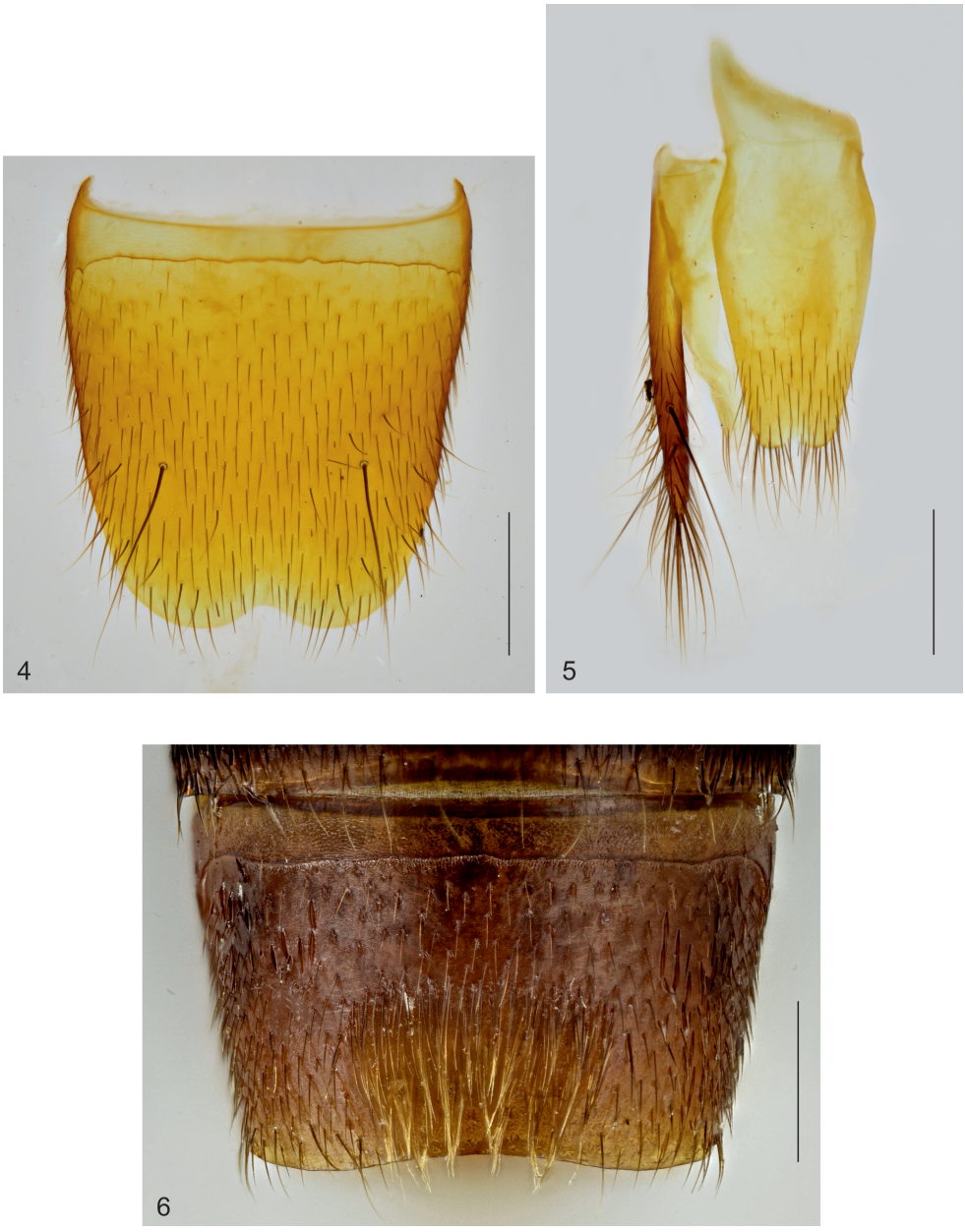
Die Arbeit bietet einen Überblick über die Gattung *Amichrotus* SHARP, 1889. Zwei Arten aus Taiwan sind neu für die Wissenschaft: *A. inaequalis* sp.n. und *A. nigripes* sp.n.

Die Aedeagi aller Arten sind abgebildet. Der Habitus von drei Arten und diagnostisch wichtige Details sind durch Farbfotografien dargestellt. Ein Bestimmungsschlüssel zu den Arten ist angefügt.

Fig. 1: Habitus of *Amichrotus apicipennis*, male (Mt. Daibosatsu).

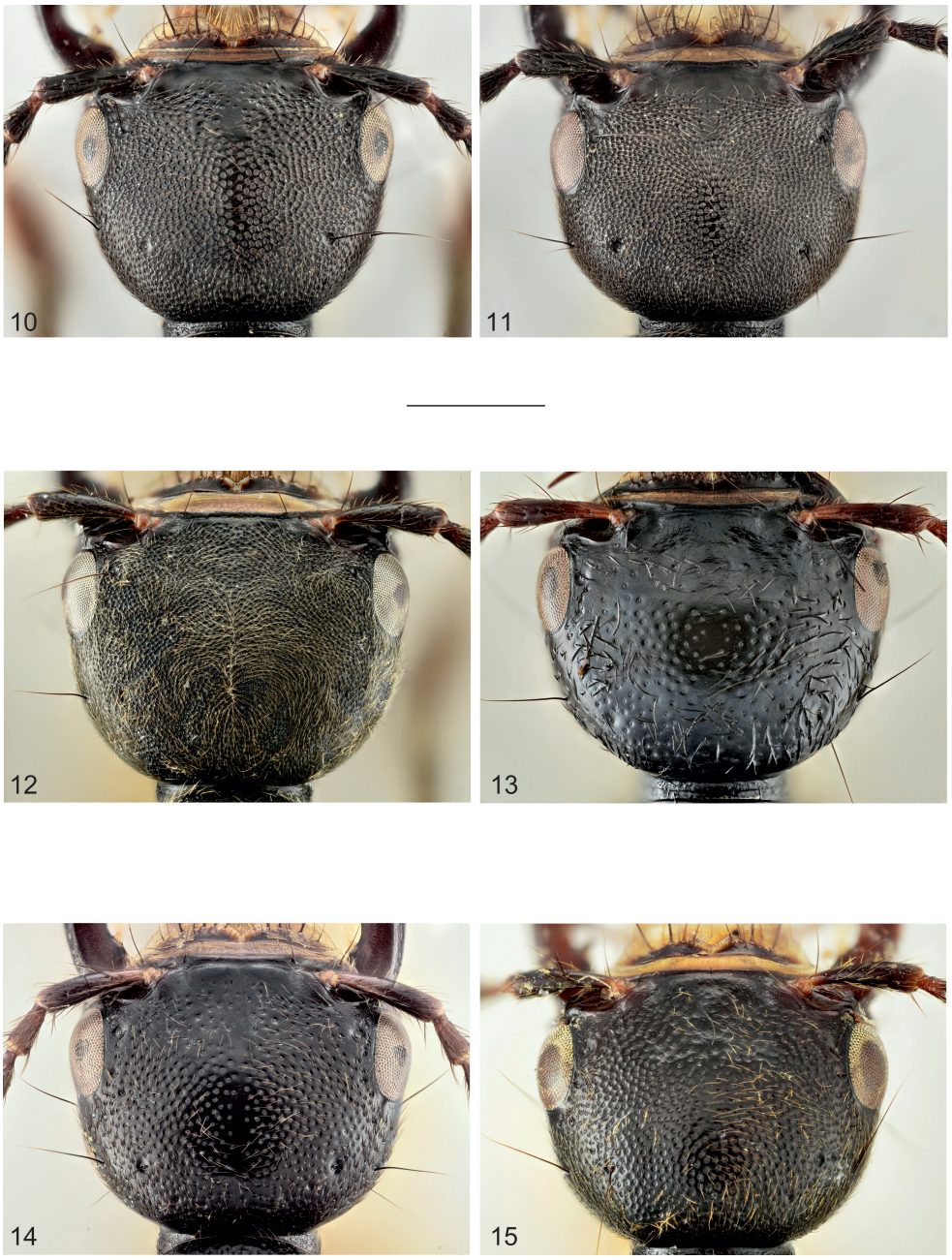
Fig. 2: Habitus of *Amichrotus inaequalis*, holotype.

Fig. 3: Habitus of *Amichrotus nigripes*, holotype.

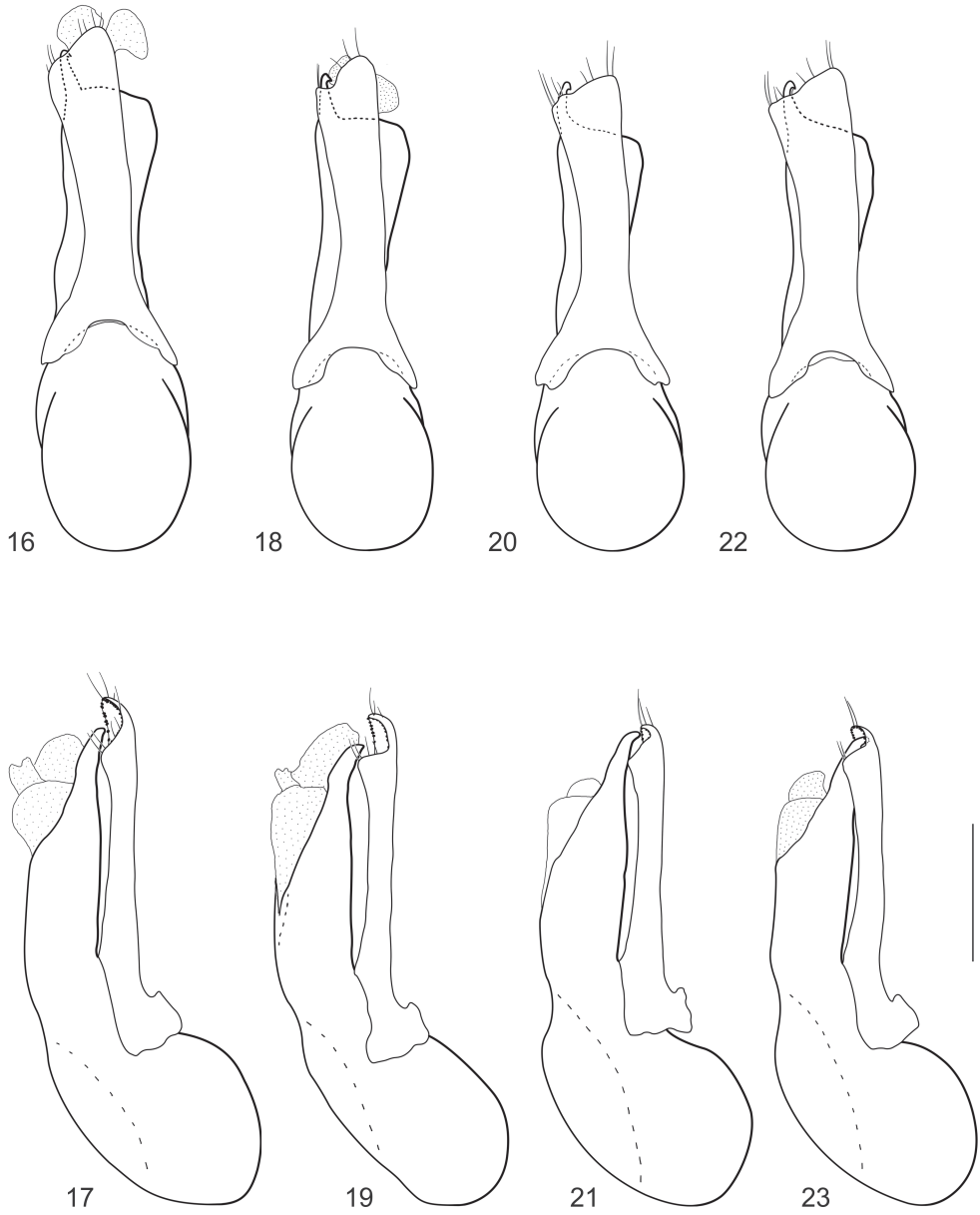


Figs. 4–6: *Amichrotus apicipennis*: 4) male sternite VIII; 5) male sternite VII; 6) male sternite IX and stylus of male tergite IX. Scale bars: 0.5 mm.

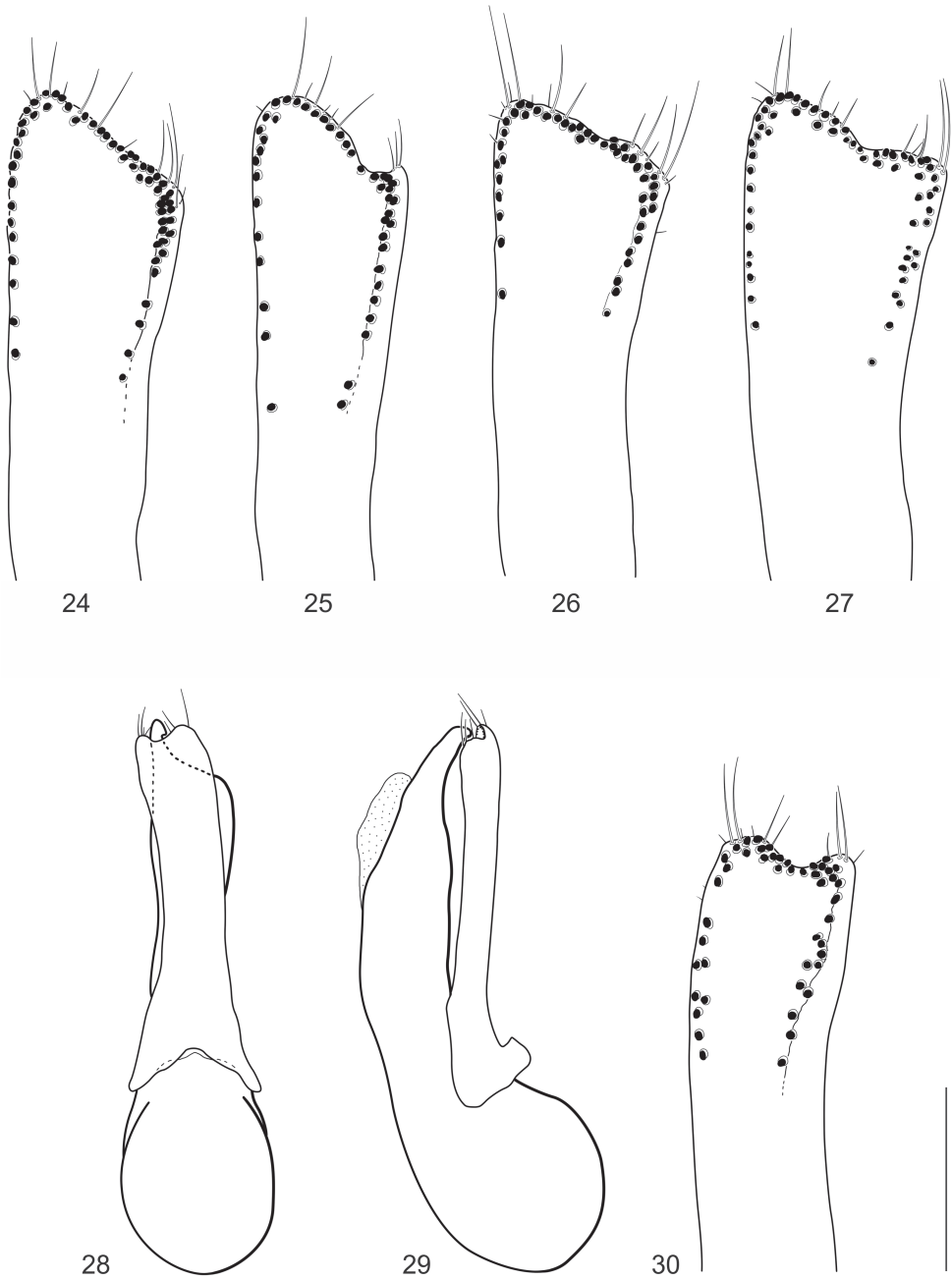
Figs. 7–9: 7–8) *Amichrotus nigripes*, right mandible of 7) male and 8) female; 9) *A. inaequalis*, elytra. Scale bars: 0.5 mm.



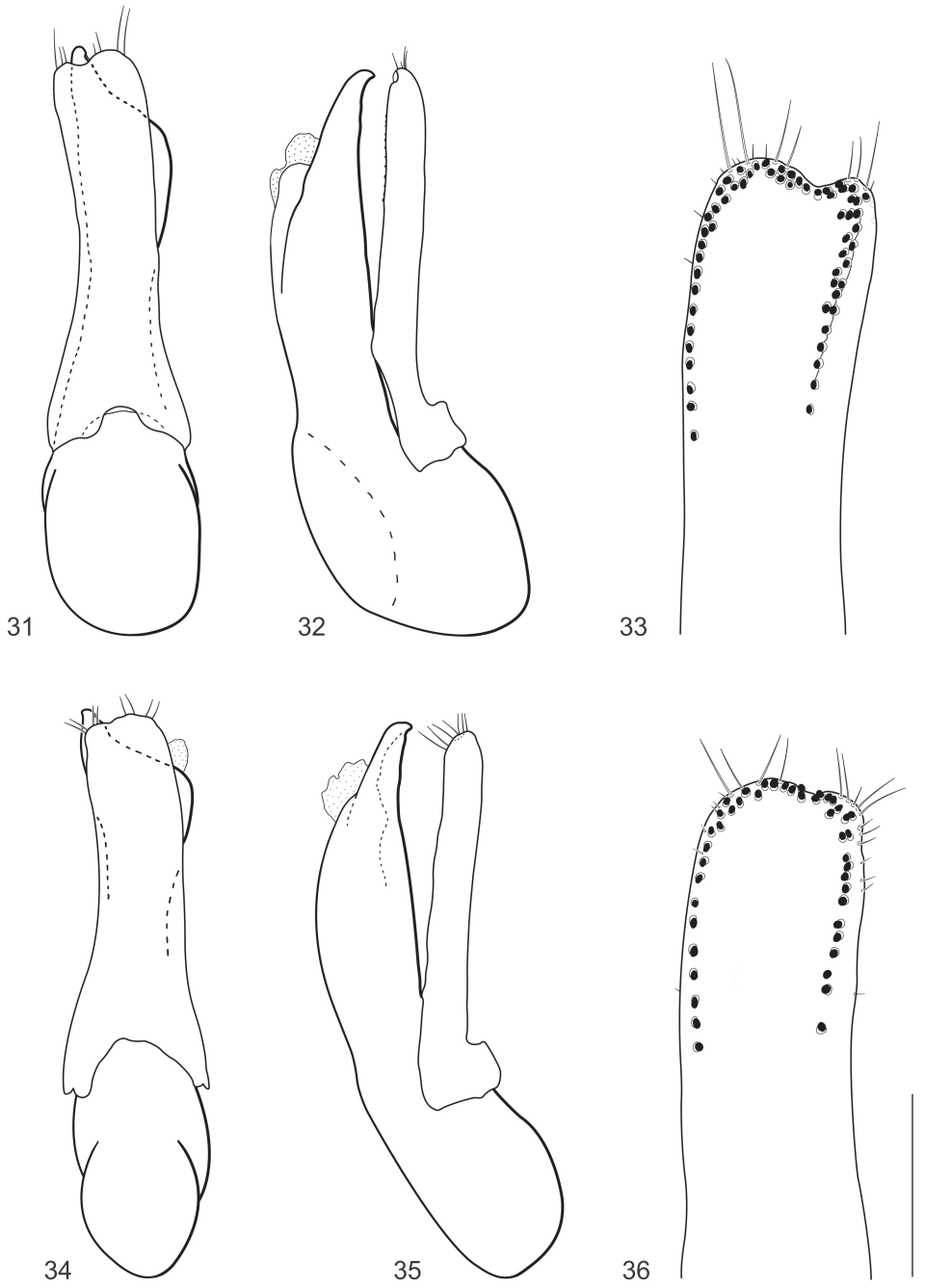
Figs. 10–15: Head (dorsal view) of 10–11) *Amichrotus apicipennis*, 12) *A. watanabei*, 13) *A. inaequalis*, 14) *A. formosanus*, 15) *A. nigripes*. Scale bar: 1.0 mm.



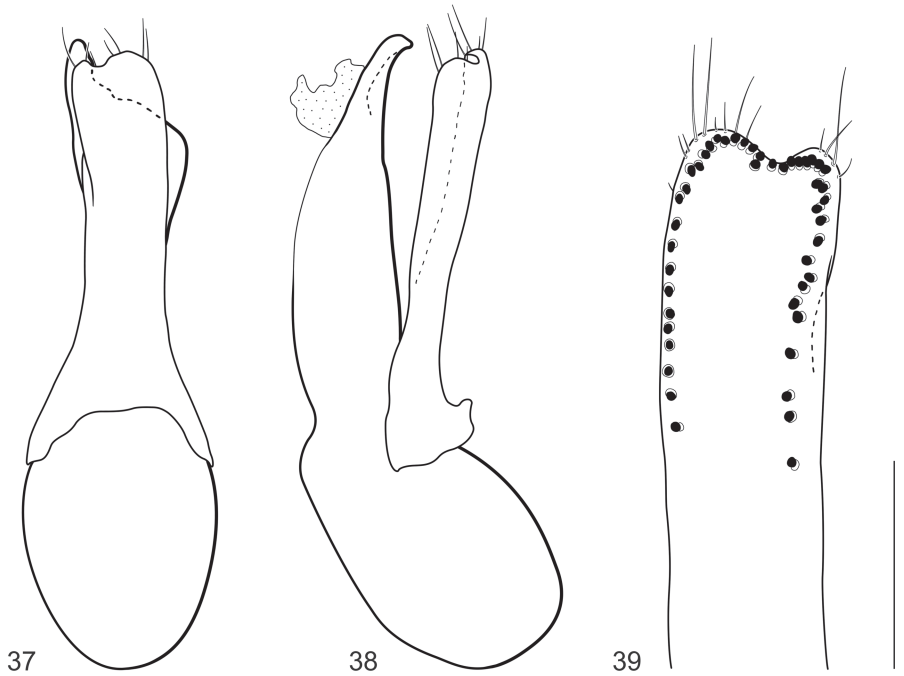
Figs. 16–23: Aedeagus of *Amichrotus apicipennis*; 16–17) Usui Pass, 18–19) Nikko Nat. Park, 20–21) Mt. Daibosastu, 22–23) Kesazawa; ventral view (16, 18, 20, 22) and lateral view (17, 19, 21, 23). Scale bar: 0.5 mm.



Figs. 24–30: 24–27) Paramere of *Amichrotus apicipennis*; 28–30) aedeagus of *A. watanabei*, 28) ventral and 29) lateral views, 30) paramere. Scale bar: 0.5 mm (28–29); 0.25 mm (24–27, 30).



Figs. 31–36: 31–33) *Amichrotus formosanus*, aedeagus; 34–36) *A. nigripes*, 31, 34) ventral and 32, 35) lateral views, 33, 36) paramere. Scale bar: 0.5 mm (31–32, 34–35); 0.25 mm (33, 36).



Figs. 37–39: Aedeagus of *Amichrotus inaequalis*; 37) ventral and 38) lateral views, 39) paramere. Scale bar: 0.5 mm (37–38); 0.25 mm (39).

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