

## **On the *Tetrasticta* fauna of Laos (Coleoptera: Staphylinidae: Aleocharinae: Aleocharini)**

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ASSING V. 2020: On the *Tetrasticta* fauna of Laos (Coleoptera: Staphylinidae: Aleocharinae: Aleocharini). *Acta Musei Moraviae, Scientiae biologicae* **105(2)**: 131–144. – Three species of *Tetrasticta* Kraatz, 1857 are described and illustrated, all of them from the same locality in Bokeo province, Northwest Laos: *Tetrasticta varia* sp. nov.; *T. crassa* sp. nov.; *T. puncticeps* sp. nov. The habitus and primary sexual characters of *T. brevipennis* (Bernhauer, 1903) are figured. Aside from the new species, four species are reported from Laos, three of them for the first time. Thus, the currently known *Tetrasticta* fauna of Laos is composed of seven species. *Tetrasticta brevipennis* is reported from Malaysia, the Indian province Uttarakhand, and the Chinese province Guangdong, and *T. bobbii* Zheng et Zhao, 2014 from Myanmar for the first time. In an addendum, *Tetrasticta borneana* sp. nov. (Malaysia: Sabah) is described and illustrated. The genus now includes a total of 20 species, except for one Afrotropical species all of them distributed in the southern East Palaearctic and Oriental regions.

**Keywords.** Coleoptera, Staphylinidae, Aleocharinae, Aleocharini, *Tetrasticta*, taxonomy, new species, new records, Palaearctic region, Oriental region, Laos, Borneo, intraspecific variation

### **Introduction**

The genus *Tetrasticta* Kraatz, 1857 (junior synonym: *Creochara* Cameron, 1931) of the tribe Aleocharini (subtribe Aleocharina) previously included a total of 16 species worldwide. Except for one species from the Afrotropical region, *T. africana* Cameron, 1950 (Zaire), all the species are distributed in the southern East Palaearctic and Oriental regions. Only one species, *T. laotica* Assing, 2016, had been reported from Laos (ASSING 2016, NEWTON 2019).

According to MARUYAMA (2013), *Tetrasticta laeta* is associated with “various termites” and the same applies to “different species of the same genus in Southeast Asia”.

Unlike many other aleocharine taxa, *Tetrasticta* species are usually subject to distinct, partly remarkable interspecific (intrageneric) variation and diversity of external characters (body size and habitus; shape and punctuation of the head; antennal morphology; shape and punctuation of the pronotum; relative length and punctuation of the elytra; punctuation of the abdomen; length of the legs, particularly the tarsi), often allowing for a reliable identification based on external characters alone.

The sexual characters of the following species have been illustrated: *T. bobbii* Zheng et Zhao, 2014, *T. brevipennis* (Bernhauer, 1903), *T. caputcyrneum* Pace, 2013 (female unknown); *T. gnatha* Yamamoto et Maruyama, 2013; *T. kinabaluensis* Pace, 2008; *T. laeta* Maruyama et Sugaya, 2002; *T. laotica*; *T. thailandensis* Pace, 2000 (male unknown) (ASSING 2016, MARUYAMA 2004, MARUYAMA & SUGAYA 2002, PACE 2000, 2008, 2010, 2013, YAMAMOTO & MARUYAMA 2013, ZHENG & ZHAO 2014).

Despite pronounced intrageneric variation, *Tetrasticta* is usually readily recognized among the genera of Aleocharini based on the conspicuously large eyes, the shape of antennomere IV (more or less distinctly transverse, often asymmetric and disc-shaped), the presence of more or less pronounced macropunctures in quadrate or quadrangular arrangement in the middle of the pronotal disc (in addition to the normal punctation), the absence of an anterior transverse impression on the abdominal tergite V, and the presence of a long flagellum basally forming more or less numerous circular coils (lateral view) in the internal sac of the aedeagus.

Recently, based on an agreement with the staff of the Naturhistorisches Museum Basel, the curator in charge, Matthias Borer, provided me with enormous numbers of Staphylinidae from Laos. A screen of this material yielded a remarkable number of individuals and species of *Tetrasticta*, including three undescribed species.

### Material and methods

The material treated in this study is deposited in the following collections:

MNB	.....	Museum für Naturkunde Berlin (incl. coll. Schülke; J. Frisch, M. Schülke)
NHMB	.....	Naturhistorisches Museum Basel (M. Borer)
NMP	.....	National Museum of Natural History, Prague (J. Hájek)
cAss	.....	author's private collection

The morphological studies were conducted using Stemi SV 11 (Zeiss) and Discovery V12 (Zeiss) microscopes, and a Jenalab compound microscope (Carl Zeiss Jena). The images were created using digital cameras (Axiocam ERc 5s, Nikon Coolpix 995), as well as Labscope and Picolay software.

Body length was measured from the anterior margin of the labrum to the apex of the abdomen, the length of the forebody from the anterior margin of the labrum to the posterior margin of the elytra, head length from the anterior margin of the clypeus to the posterior margin of the head, elytral length at the suture from the apex of the scutellum to the posterior margin of the elytra, and the length of the median lobe of the aedeagus from the apex of the ventral process to the base of the aedeagal capsule. The “parameral” side (i.e., the side where the sperm duct enters) is referred to as the ventral, the opposite side as the dorsal aspect.

### Results

#### *Tetrasticta brevipennis* (Bernhauer, 1903)

(Figs 13–15)

**Material examined. Laos:** 1 ex., Houa Phan prov., Phu Phan Mt., 20°12'N, 104°01'E, 1750 m, 17.V.–3.VI.2007, leg. Kubáň (cAss); 1 ex., Houa Phan prov., Phou Pane Mt., 20°13'N, 104°00'E, 1480–1510 m, 22.IV.–14.V.2008, leg. Kubáň (cAss).

**India: Uttarakhand:** 1 ex., Uttarkashi distr., 14 km E Uttarkashi, 30°45'N, 78°34'E, 1450 m, 10–12.IV.2012, leg. Shavrin (cAss); 1 ex., same data, but N Gangmani, 13–15.IV.2012 (cAss); 1 ex., 5 km N Ramnagar, left side of Kosi river, 7–11.VI.2011, leg. Shavrin (cAss).

**China: Sichuan:** > 10 exs., Moxi env., Hailuogou valley, Mulinsen vill., 20°37'N, 102°07'E, 1680 m, pig carrion in advanced decay, 19.VI.2014, leg. Hájek & Růžička (NMP, cAss). **Guangdong:** > 2 exs., Danxia Shan National Park, Wo Long Gang forest walkway, 25°01'N, 113°45'E, 100 m, 23–26.IV.2013, leg. Hájek & Růžička (NMP, cAss).

**Japan:** 24 exs., Kagoshima Pref., Tokunoshima Island, Amagi-dake, primary forest, mongoose carrion, 27.IV.–7.V.2013, leg. Lackner (cAss); 1 ex., Kagoshima Pref., Amami, Oshima Island, Arangachi waterfall near Ukenon, rotten oranges, 26.III.2010, leg. Lackner (cAss).

**Malaysia:** 2 exs., Pahang, Cameron Highlands, Tanah Rata env., 1500–1600 m, flight interception trap, 4.IV.2011, leg. Hergovits (cAss).

*Tetrasticta brevipennis* is the most widespread and most common species of the genus, its previously known distribution ranging from North India (Himachal Pradesh across China to Japan, South Korea, Taiwan, Thailand, Vietnam, and Indonesia (Sumatra) (NEWTON 2019). The above material includes the first records from Laos, Malaysia, the Indian province Uttarakhand, and the Chinese province Guangdong.

The habitus and the primary sexual characters are illustrated in Figs 13–15.

#### *Tetrasticta laotica* Assing, 2016

**Material examined. Laos:** 36 exs., Houa Phan prov., Phu Phan Mt., 20°12'N, 104°01'E, 1750 m, 17.V.–3.VI.2007, leg. Kubáň (cAss, MNB); 9 exs., Houa Phan prov., Phou Pane Mt., 20°13'N, 104°00'E, 1480–1510 m, 22.IV.–14.V.2008, leg. Kubáň (cAss); > 100 exs., Bokeo prov., 5 km W Ban Toup, Bokeo Nature Reserve, 20°27–28'N, 100°45'E, 500–700 m, 4–18.V.2011, leg. Brancucci et al. (cAss).

The original description of this species is based on four type specimens from Phongsaly and Oudom Xai provinces, North Laos (ASSING 2016). The above records suggest that it is rather common in Laos.

One of the specimens from Phu Phan Mt. (Houa Phan province) differs from the type material and other examined specimens by a practically uniformly dark-coloured abdomen.

#### *Tetrasticta laeta* Maruyama et Sugaya, 2002

**Material examined. Laos:** 16 exs., Houa Phan prov., Phu Pane Mt., 20°13'N, 104°00'E, 1480–1510 m, 22.IV.–14.V.2008, leg. Kubáň (cAss); > 50 exs., Houa Phan prov., Phu Phan Mt., 20°12'N, 104°01'E, 1750 m, 17.V.–3.VI.2007, leg. Kubáň (cAss, MNB); > 30 exs., Houa Phan prov., Phou Pane Mt., 20°13'N, 104°00'E, 1480–1510 m, 22.IV.–14.V.2008, leg. Kubáň (cAss); 1 ex., Bokeo prov., 5 km W Ban Toup, Bokeo Nature Reserve, 20°27–28'N, 100°45'E, 500–700 m, 4–18.V.2011, leg. Brancucci et al. (cAss).

*Tetrasticta laeta* was originally described based on material from South Japan and Taiwan (MARUYAMA & SUGAYA 2002). The above specimens, which were compared with a paratype, represent the first records from Laos.

#### *Tetrasticta bobbii* Zheng et Zhao, 2014

**Material examined. Laos:** 38 exs., Bokeo prov., 5 km W Ban Toup, Bokeo Nat. Res., 20°27–28'N, 100°45'E, 500–700 m, 4–18.V.2011, leg. Brancucci et al. (cAss); 2 exs., Houa Phan prov., Phou Pane Mt., 20°13'N, 104°00'E, 1480–1510 m, 22.IV.–14.V.2008, leg. Kubáň (cAss).

**Myanmar:** 2 exs., Chin State, NW Falam, 400–500 m, V–VI.2016, leg. local collector (MNB).

This species was previously known only from the type locality in the south of Yunnan province, China (ZHENG & ZHAO 2014). The above specimens represent the first records from Laos and Myanmar.

***Tetrasticta varia* sp. nov.**

(Figs 1–7)

**Type material examined.** Holotype ♂: “LAOS – Bokeo prov., 5 km W Ban Toup, Bokeo Nature Reserve, 20°27–28′N, 100°45′E, 500–700 m, 4–18.V.2011, leg. Brancucci et al. / Holotypus ♂ *Tetrasticta varia* sp. n., det. V. Assing 2020” (NHMB). Paratypes: 28 exs.: same data as holotype (NHMB, cAss).

**Description.** Species of very variable size and habitus (Figs 1–3); body length 3.1–4.3 mm; length of forebody 1.3–1.8 mm. Coloration: head yellowish-brown to blackish-brown; pronotum reddish-yellow to brown; elytra anteriorly yellowish, posteriorly more or less distinctly and more or less extensively infuscate; abdomen pale-reddish with most of tergite VI and often also parts of tergites VII–VIII, occasionally even the posterior portion of tergite V more or less distinctly infuscate; legs yellow; antennae brown with the basal 2–3 antennomeres yellow; maxillary palpi yellowish.

Head (Fig. 4) approximately as broad as long or weakly transverse, of orbicular shape; punctuation fine to moderately fine and moderately sparse; interstices without microsculpture.

Eyes very large and smoothly convex, approximately three times as long as distance from posterior margin of eye to posterior margin of head in dorsal view. Antenna 1.0–1.2 mm long; antennomere IV disc-shaped and much shorter than antennomeres V–X; antennomeres V–X moderately transverse, approximately 1.5 times as broad as long.

Pronotum (Fig. 4) of very variable shape, broadest in the middle or in anterior half (sometimes close to anterior angles), but not of distinctly trapezoid shape, 1.10–1.25 times as broad as long and 1.10–1.28 times as broad as head; punctuation similar to that of head, but slightly denser, the four macropunctures on the disc not much more distinct than the remaining punctuation; interstices without microsculpture.

Elytra 0.75–0.83 times as long as pronotum; punctuation fine and dense; interstices without distinct microsculpture. Hind wings present. Metatarsomere I slightly to distinctly longer than the combined length of metatarsomeres II and III.

Abdomen narrower than elytra; tergites III–IV with, tergite V without shallow anterior impressions; punctuation moderately fine and rather sparse, anterior thirds of tergites practically impunctate; interstices without microsculpture; posterior margin of tergite VII with palisade fringe; posterior margin of tergite VIII with more or less distinct, mostly small median excision.

♂: median lobe of aedeagus (Figs 5–6) approximately 0.4 mm long; ventral process straight in apical two-thirds in lateral view; internal sac with long flagellum forming approximately 5–6 coils basally.

♀: spermatheca shaped as in Fig. 7.

**Comparative notes.** This highly distinctive species is readily distinguished from all other species of the genus by the slender habitus, the conspicuous coloration, and the sexual characters, from most congeners additionally by the rather fine macropunctures on the pronotum.

**Distribution and natural history.** The type locality is situated in Bokeo province, Northwest Laos. The specimens were collected on the wing, probably with a Malaise trap, at an altitude of 500–700 m. *Tetrasticta laotica*, *T. laeta*, *T. bobbii*, and the two species newly described below were found in the same locality.

**Etymology.** The specific epithet (Latin, adjective: colourful, variable) refers to both the distinctive coloration and the enormous intraspecific variation of this species.

***Tetrasticta crassa* sp. nov.**

(Figs 8–12)

**Type material examined.** Holotype ♀: “LAOS – Bokeo prov., 5 km W Ban Toup, Bokeo Nature Reserve, 20°27–28′N, 100°45′E, 500–700 m, 4–18.V.2011, leg. Brancucci et al. / Holotypus ♀ *Tetrasticta crassa* sp. n., det. V. Assing 2020” (NHMB). Paratype ♀: same data as holotype (cAss).

**Description.** Rather large species of stout habitus. Body length 6.4–7.2 mm; length of forebody 2.5–2.8 mm. Habitus as in Fig. 8. Coloration: head black; pronotum blackish-brown to black; elytra dark-yellow with the postero-lateral portions more or less extensively blackish; abdomen with segments III–V reddish to brown and segments VI–VIII blackish-brown to black; antennae dark-brown with the basal two antennomeres yellowish; maxillary palpi reddish-yellow.

Head (Fig. 9) distinctly transverse; punctation distinct and moderately sparse; interstices without microsculpture. Eyes very large and strongly convex, approximately four times as long as distance from posterior margin of eye to posterior margin of head in dorsal view. Antenna (Fig. 10) 1.6–1.7 mm long; antennomere IV disc-shaped, asymmetric, and much shorter than antennomeres V–X; antennomeres V–X moderately transverse, approximately 1.5 times as broad as long.

Pronotum (Fig. 9) large and strongly transverse, broadest in or behind middle, 1.43–1.46 times as broad as long and 1.38–1.41 times as broad as head, lateral and posterior margins together forming a smoothly convex outline (i.e., posterior angles completely obsolete; pronotum not of trapezoid shape); punctation similar to that of head, the four discal macropunctures distinct; interstices without microsculpture.

Elytra (Fig. 9) short, approximately 0.6 times as long as pronotum; punctation rather coarse and dense; interstices without microsculpture. Hind wings present. Metatarsomere I as long as, or shorter than the combined length of metatarsomeres II and III.

Abdomen (Fig. 11) approximately as broad as elytra; tergites III–IV with, tergite V without shallow anterior impressions; punctation fine and rather sparse; interstices without microsculpture; posterior margin of tergite VII with palisade fringe; posterior margin of tergite VIII smoothly convex.

♂: unknown.

♀: spermatheca shaped as in Fig. 12.

**Comparative notes.** This distinctive species is readily distinguished from other congeners based on external characters alone, so that a description based exclusively on females seems justified. It is characterized particularly by large body size in combination with a stout habitus, a strongly transverse pronotum, short elytra, and by the shape of the spermatheca.

**Distribution and natural history.** The type locality and the circumstances of collection are identical to those of *T. varia*.

**Etymology.** The specific epithet (Latin, adjective: thick) alludes to the conspicuously stout habitus.

*Tetrasticta puncticeps* sp. nov.

(Figs 16–22)

**Type material examined.** Holotype ♂: “LAOS – Bokeo prov., 5 km W Ban Toup, Bokeo Nature Reserve, 20°27–28′N, 100°45′E, 500–700 m, 4–18.V.2011, leg. Brancucci et al. / Holotypus ♂ *Tetrasticta puncticeps* sp. n., det. V. Assing 2020” (NHMB). Paratypes: 22 exs.: same data as holotype (NHMB, cAss).

**Description.** Body length 3.1–4.4 mm; length of forebody 1.3–1.9 mm. Habitus as in Fig. 16. Coloration: body blackish-brown to black with the base of the abdomen (up to segment IV or V) more or less distinctly paler (reddish to brown); legs dark-yellow to pale-brown, usually with the metafemora and metatibiae at least partly darker; antennae dark-brown with the basal 2–3 antennomeres dark-yellow to pale-brown; maxillary palpi yellowish.

Head (Fig. 17) approximately as broad as long or weakly transverse, of orbicular shape; punctation distinct and very dense; interstices without microsculpture. Eyes very large and distinctly convex, approximately four times as long as distance from posterior margin of eye to posterior margin of head in dorsal view. Antenna (Fig. 18) 1.3–1.6 mm long; antennomere IV asymmetric and strongly transverse, but not disc-shaped; antennomere V much longer than IV, as long as broad or weakly oblong; antennomeres VI–X weakly transverse, less than 1.5 times as broad as long.

Pronotum (Fig. 17) strongly transverse, 1.4–1.5 times as broad as long and 1.1–1.2 times as broad as head, of trapezoid shape (i.e., broadest anteriorly, strongly tapering posteriorly; posterior angles at least weakly marked); general punctation extremely fine, visible only at high magnification (100 x), the four discal macropunctures very coarse and distinct, laterally with another coarse macropuncture on either side; interstices without microsculpture.

Elytra (Fig. 17) 0.6–0.7 times as long as pronotum; punctation fine and very dense; interstices without distinct microsculpture. Hind wings present. Tarsi very long and slender; metatarsus nearly as long as metatibia; metatarsomere I at least as long as combined length of metatarsomeres II–IV.

Abdomen (Fig. 19) only slightly narrower than elytra; tergites III–IV with, tergite V without shallow anterior impressions; punctation distinct and rather dense on tergites III–IV, finer and much sparser on tergites V–VII; posterior margin of tergite VII with palisade fringe; posterior margin of tergite VIII smoothly convex.

♂: median lobe of aedeagus (Figs 20–21) approximately 0.5 mm long; ventral process of distinctive shape in lateral view; internal sac with relatively short flagellum forming only one coil basally.

♀: spermatheca shaped as in Fig. 22.

**Comparative notes.** *Tetrasticta puncticeps* is distinguished from other congeners of similar size recorded from Laos by a densely punctate head, long tarsi, the shape of the

aedeagus, and the shape of the spermatheca. Based on the similar external (habitus, punctuation of head, pronotum, and abdomen, elongate tarsi, morphology of antennae) and sexual characters (general morphology of the median lobe of the aedeagus, including a short flagellum, and of the spermatheca), *T. puncticeps* is most closely allied to *T. kinabaluensis* PACE, 2008 from Borneo, from which it is separated only by the differently shaped ventral process of the significantly smaller aedeagus (*T. kinabaluensis*: median lobe approximately 0.65 mm long, if the scale bar provided in the original description is correct), a slightly longer flagellum, the shape of the spermatheca (*T. kinabaluensis*: distal portion apically less acute, basally not distinctly separated from proximal portion), and smaller body size (*T. kinabaluensis*: body length 5.0 mm). For illustrations of *T. kinabaluensis* see PACE (2008).

**Distribution and natural history.** The type locality and the circumstances of collection are identical to those of *T. varia* and *T. crassa*.

**Etymology.** The specific epithet alludes to the dense punctuation of the head, a character distinguishing this species from other species of similar size recorded from Laos.

#### Key to the *Tetrasticta* species of Laos

- 1 Larger species, length of forebody >2.4 mm. .... 2
- Smaller species, length of forebody <2.4 mm. .... 3
- 2 Largest species of the genus, length of forebody >3.3 mm; habitus more slender (Fig. 13). Coloration of body uniformly black; legs dark-brown to blackish. Head and pronotum with micropunctuation. Antennomere IV distinctly transverse, but not disc-shaped. Pronotum less transverse, <1.3 times as broad as long and of somewhat trapezoid shape. Median lobe of aedeagus very large and with very long flagellum forming numerous coils basally (Fig. 14). Spermatheca as in Fig. 15. Widespread from the Himalaya to Japan and Indonesia. .... *brevipennis*
- Smaller species, length of forebody <3.0 mm. Elytra partly and legs completely yellowish (Fig. 8). Head and pronotum without micropunctuation (Fig. 9). Antennomere IV strongly transverse, asymmetrically disc-shaped (Fig. 10). Pronotum strongly transverse, >1.4 times as broad as long and with lateral and posterior margins forming smoothly convex contours (i.e., pronotum not of trapezoid shape) (Fig. 9). Spermatheca as in Fig. 12. Northwest Laos. .... *crassa*
- 3 Antennomere IV not disc-shaped (Fig. 18), less than twice as broad as long. Head with dense and distinct punctuation (Fig. 17). Median lobe of aedeagus and spermatheca as in Figs 20–22. Northwest Laos. .... *puncticeps*
- Antennomere IV disc-shaped, at least three times as broad as long. .... 4
- 4 Pronotum of trapezoid shape, broadest anteriorly, strongly tapering posteriad, and with more or less marked posterior angles. Abdomen distinctly bicoloured: segments III and IV or III–V reddish-yellow, strongly contrasting with the following darker segments (ZHENG & ZHAO 2014: figure 1A). Head not



- distinctly transverse (ZHENG & ZHAO 2014: figures 1B–C). Median lobe of aedeagus and spermatheca: ZHENG & ZHAO (2014: figures 1I–J, L). China (Yunnan); Laos; Myanmar. .... *bobbii*
- Pronotum not of trapezoid shape. .... **5**
- 5 Slender species (Figs 1–3). Pronotum pale-reddish to brown. Head approximately as long as broad or weakly transverse (Fig. 4). Median lobe of aedeagus and spermatheca as in Figs 5–7. Northwest Laos. .... *varia*
- Species of broader habitus. Pronotum blackish-brown to blackish. Head distinctly transverse. .... **6**
- 6 Elytra yellowish with the postero-lateral portions more or less extensively and more or less distinctly infuscate. Abdomen of predominantly dark coloration with the anterior segments often more or less distinctly paler. Median lobe of aedeagus and spermatheca as in MARUYAMA & SUGAYA (2002: figures 8–11). South Japan, Taiwan, Laos. .... *laeta*
- Elytra of uniformly dark coloration. Abdomen usually reddish with the preapical segments often slightly darker, rarely completely dark. Median lobe of aedeagus and spermatheca as in ASSING (2016: figures 3–4). Laos. .... *laotica*

#### Addendum

In material collected by canopy fogging in Sabah (Malaysia), Borneo, and made available to me by Andreas Floren, University of Würzburg, two specimens belonging to two species of *Tetrasticta* were found. One of them is a teneral female and may be conspecific with *T. kinabaluensis*. The other specimen, a male, proved to belong to an undescribed species allied to *T. kinabaluensis* and *T. puncticeps*.

#### *Tetrasticta borneana* sp. nov.

(Figs 23–27)

**Type material examined.** Holotype ♂: “SABAH: Poring Hot Spring., Aporusa Sp., Lower Montane dipterocarp Fst. > 650 m / Fog A50/F4 – 4, 17[?].II.1993, A. Floren / Holotypus ♂ *Tetrasticta borneana* sp. n., det. V. Assing 2020” (cAss).

**Description.** Body length 3.8 mm; length of forebody 1.8 mm. Habitus as in Fig. 23. Coloration: head blackish-brown with the frons and clypeus reddish; pronotum brown; elytra yellowish-brown with the scutellar and lateral portions weakly and diffusely infuscate; abdomen dark-brown with the margins of tergite III, the posterior portion of tergite VII, and segments VIII–X yellow; legs dark-yellow; antennae blackish-brown with antennomere I reddish-yellow; maxillary palpi yellowish.

Head (Fig. 24) transverse; punctation distinct and very dense in posterior portion (behind antennal insertions); interstices without microsculpture. Eyes very large and distinctly convex. Antenna (Fig. 25) 1.9 mm long and massive; antennomere I conspicuously long and massive; antennomere IV asymmetric and moderately transverse,



not disc-shaped; antennomere V much larger and longer than IV, as long as broad; antennomeres VI–X weakly transverse, less than 1.5 times as broad as long.

Pronotum (Fig. 24) transverse, 1.3 times as broad as long and 1.1 times as broad as head, of sub-trapezoid shape, broadest in anterior half; posterior angles obtusely marked; general punctation extremely fine, visible only at high magnification, the four discal macropunctures very coarse and distinct, laterally with another coarse macropuncture on either side; interstices without microsculpture.

Elytra (Fig. 24) 0.7 times as long as pronotum; punctation very dense and fine, but distinct; interstices without microsculpture. Hind wings fully developed. Tarsi very long and slender; metatarsus nearly as long as metatibia; metatarsomere I slightly longer than combined length of metatarsomeres II–IV.

Abdomen: tergites III–IV with, tergite V without shallow anterior impressions; punctation distinct and rather dense on tergites III–IV, finer and much sparser on tergites V–VI; posterior margin of tergite VII with palisade fringe.

♂: median lobe of aedeagus (Figs 26–27) 0.53 mm long; ventral process straight in lateral view; internal sac with relatively short flagellum forming only one coil basally.

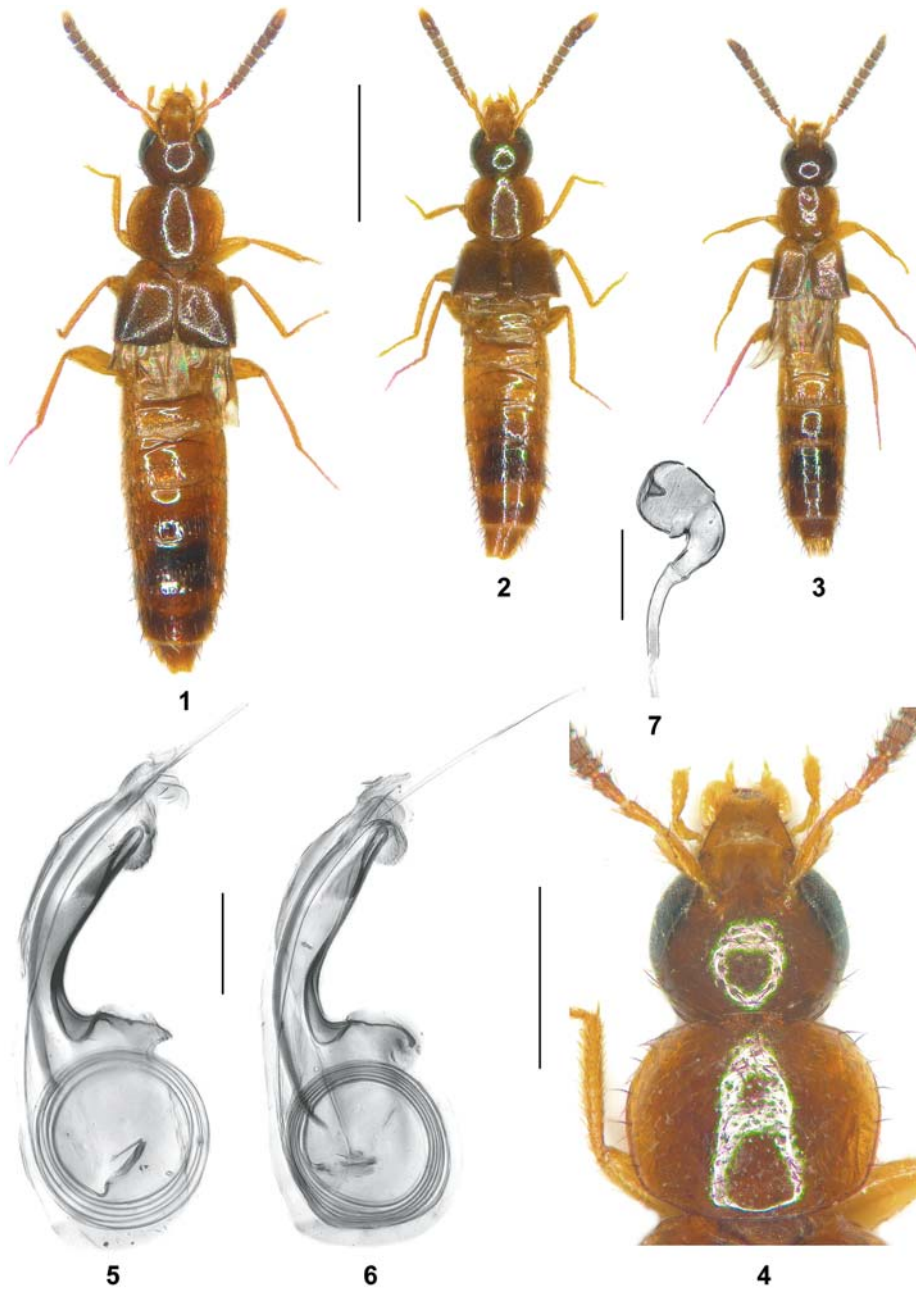
**Comparative notes.** Based on the punctation of the head and on the morphology of the aedeagus, *T. borneanus* is closely allied to *T. kinabaluensis* and *T. puncticeps*. It is distinguished from both species by significantly more massive antennae, a longer and more massive antennomere I, a less transverse pronotum, and above all by the shape of the aedeagus (ventral process straight in lateral view). For illustrations of *T. kinabaluensis* see PACE (2008). The new species differs from other congeners recorded from the Great Sunda islands by its coloration alone.

**Distribution and natural history.** The type locality is situated in Sabah (Malaysia), North Borneo. The holotype was collected by canopy fogging in a lower montane dipterocarp forest.

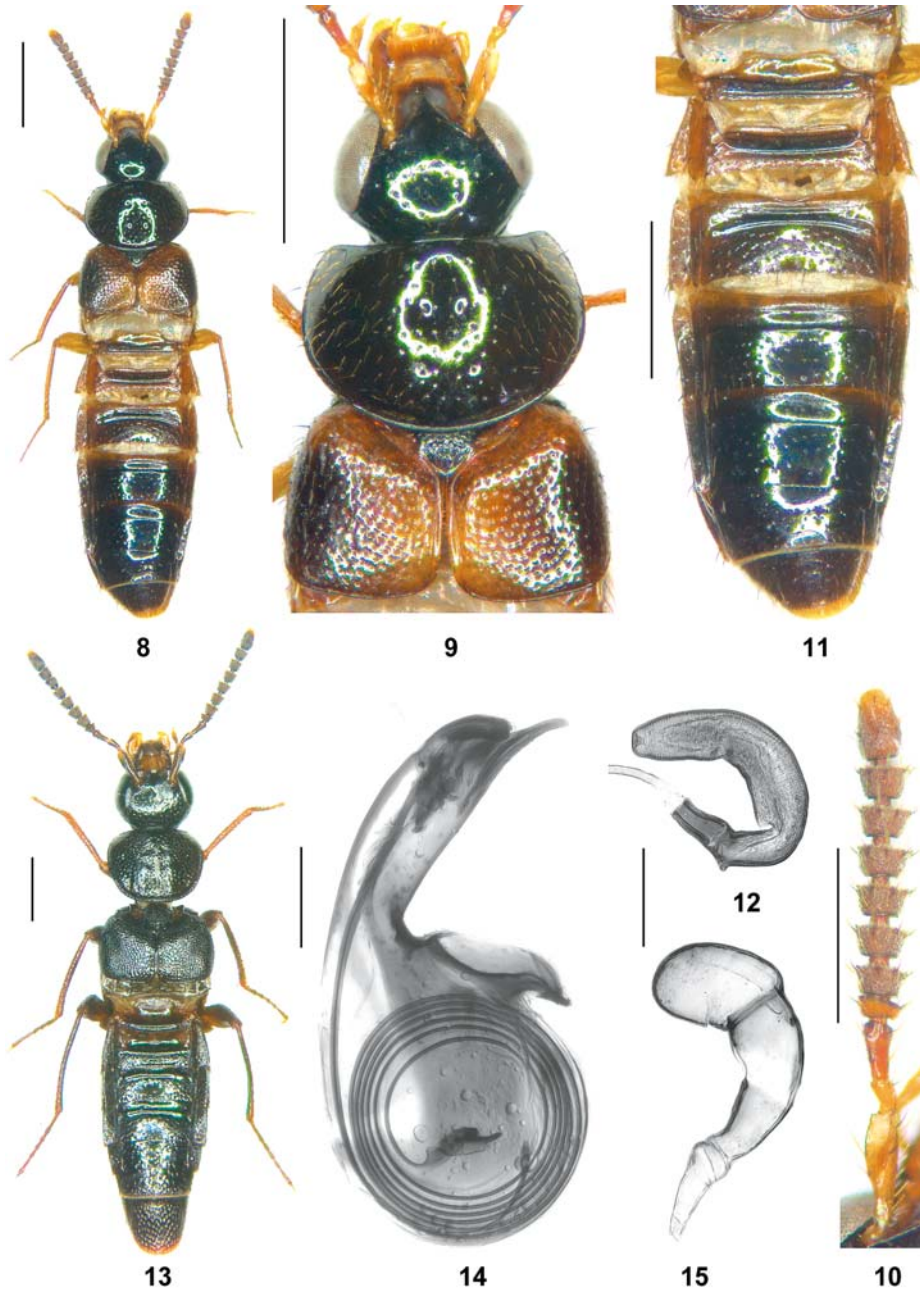
**Etymology.** The specific epithet is an adjective derived from Borneo.

#### Acknowledgements

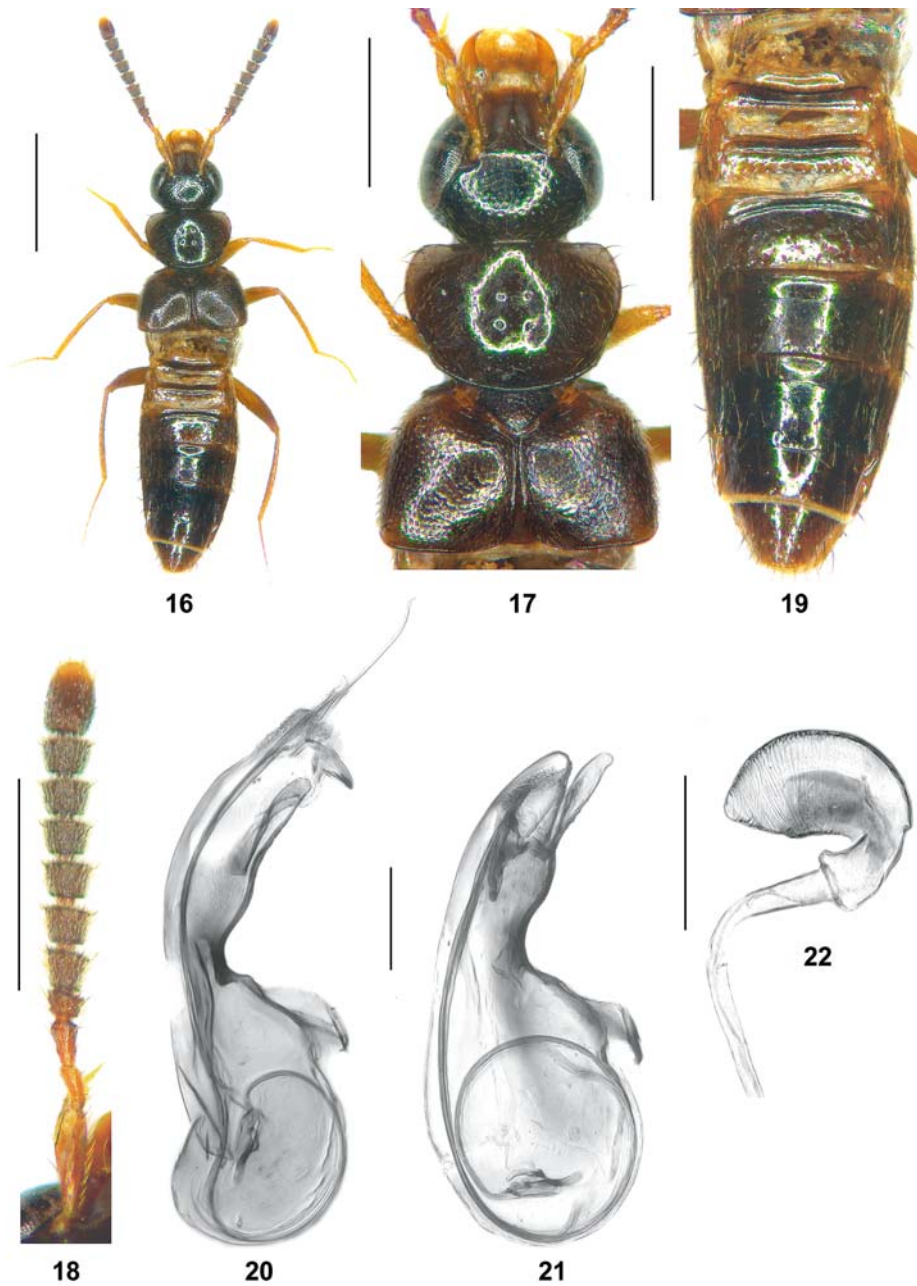
I am indebted to the colleagues indicated in the material section for the loan of material from the collections under their care, in particular to Matthias Borer (NHMB) for the generous gift of enormous numbers of Staphylinidae from Laos, this material including the vast majority of the specimens which this study is based on. Andreas Floren (University of Würzburg), assisted by Peter Sprick (Hannover), made two specimens from Borneo available. The comments and suggestions of two anonymous reviewers are appreciated.



**Figs 1–7.** *Tetrasticta varia* sp. nov. 1–3 – habitus; 4 – head and pronotum; 5–6 – median lobe of aedeagus in lateral view; 7 – distal portion of spermatheca. Scale bars: 1–3: 1.0 mm; 4: 0.5 mm; 5–7: 0.1 mm.

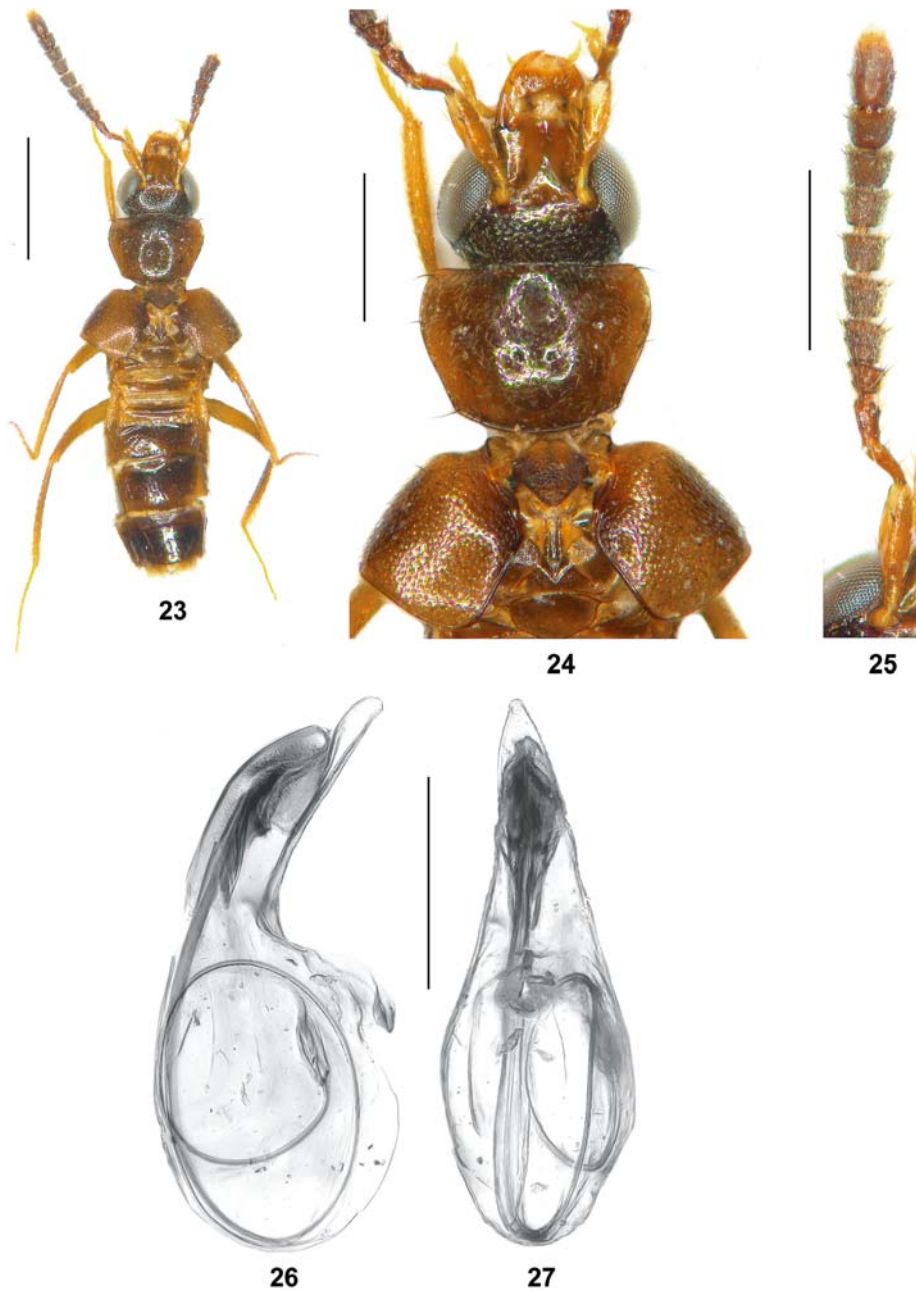


**Figs 8–15.** *Tetrasticta crassa* sp. nov. (8–12) and *T. brevipennis* (Bernhauer) (13–15). 8, 13 – habitus; 9 – forebody; 10 – antenna; 11 – abdomen; 12, 15 – distal portion of spermatheca; 14 – median lobe of aedeagus in lateral view. Scale bars: 8–9, 11, 13: 1.0 mm; 10: 0.5 mm; 14: 0.2 mm; 12, 15: 0.1 mm.



**Figs 16–22.** *Tetrasticta puncticeps* sp. nov. 16 – habitus; 17 – forebody; 18 – antenna; 19 – abdomen; 20–21 – median lobe of aedeagus in lateral view; 22 – distal portion of spermatheca. Scale bars: 16: 1.0 mm; 17–19: 0.5 mm; 20–22: 0.1 mm.





**Figs 23–27.** *Tetrasticta borneana* sp. nov. 23 – habitus; 24 – forebody; 25 – antenna; 26–27 – median lobe of aedeagus in lateral view. Scale bars: 23: 1.0 mm; 24–25: 0.5 mm; 26–27: 0.2 mm.

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