

**A contribution to knowledge of Moluccan species of *Caloglycyphana* Mikšič, 1968
(Coleoptera: Scarabaeidae: Cetoniinae)**

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Abstract. Sexually dimorphic species of *Caloglycyphana* Mikšič, 1968, occurring in western, central and northern part of Indonesian Moluccas are studied. *Glycyphana* (*Caloglycyphana*) *bella* Wallace, 1867 is synonymised with *Glycyphana* (*Caloglycyphana*) *quadriguttata* Snellen van Vollenhoven, 1864. *Glycyphana* (*Caloglycyphana*) *wallacei* sp. nov. is described from the central part of Moluccas. It is compared with its closest, historically known congeners. Both sexes of all recently known species of *Caloglycyphana* Mikšič occurring in northern, western and central parts of Indonesian Moluccas are pictured and compared. Male aedeagi of all locally known species are also pictured and compared.

INTRODUCTION

Genus *Glycyphana* Burmeister, 1842 was split into several subgenera by Mikšič (1968a). Some of Mikšič's originally described subgenera have been raised to the genus level since that time. Six subgenera are currently recognised. Species with significantly expressed sexual dimorphism are accommodated in two subgenera, *Heteroglycyphana* Mikšič, 1968 with three currently known species and *Caloglycyphana* Mikšič with approximately 20 species and 5 subspecies.

This study concentrates on *Caloglycyphana* Mikšič species with significantly developed sexual dimorphism, flying in the Indonesian Moluccas. Three different species have been described from this area. The description of historically oldest species, *Glycyphana* (*Caloglycyphana*) *quadriguttata* Snellen van Vollenhoven, 1864 is based on females. The description of *Glycyphana* (*Caloglycyphana*) *bella* Wallace, 1867 is based on a single male. Examination of several institutional and private collections revealed that both species are conspecific. Species described by Snellen van Vollenhoven was described first, so it has priority. Species are synonymised in taxonomical part of this article.

For unknown reasons, males of species discussed above are very rare. The ratio between males and females in collections examined by the present author is more than 1 : 10, in most collections males are completely missing. The same can be said about not yet described *Caloglycyphana* occurring in the central part of the Moluccas. Even though the species is represented in many collections, most specimens examined here are females, which are extremely similar with females of *G. quadriguttata*. In author's opinion that was main reason, why this species is mostly incorrectly identified in most collections. The species is currently known only from Seram and Ambon Islands and will be described in the present work.

Third *Caloglycyphana* species known from the western part of the Moluccas is *Glycyphana (Caloglycyphana) trivittata* Wallace, 1867. Species is endemic to Buru Island. In contrary with species discussed later, in this case both sexes are very similar and also the ratio between males and females (approximately 80 specimens examined) is more or less same.

Eastern parts of the Moluccas are inhabited by another species, *Glycyphana (Caloglycyphana) papua* Wallace, 1867. This species belongs to a different group than species discussed later. It has huge distribution area encompassing eastern parts of Indonesia, Papua New Guinea with its surrounding islands, north part of Australian Queensland and Solomon Islands. Species has currently numerous synonyms and the author would like to publish results of study about this variable insect in one of possible future works.

MATERIAL AND METHODS

Following codens of institutional and private collections are used in the text:

BMNH Natural History Museum, London, United Kingdom;

RMNH Rijksmuseum van Natuurlijke Historie, Leiden, the Netherlands;

SJCP private collection of Stanislav Jákl, Praha, Czech Republic;

Specimens of newly described species are provided with red and yellow printed labels, red for HOLOTYPUS, yellow for PARATYPUS. Each holotype or paratype label is provided with sex symbol, number of paratype (on paratype label) and words St. Jákl det. 2017. Label data are cited for the material examined, individual labels are indicated by a double slash (//), individual lines by a single slash (/).

TAXONOMY

Glycyphana (Caloglycyphana) Mikšič 1968

Glycyphana (Caloglycyphana) Mikšič, 1968: 139, 141, figs. 1,8 (original description) : type species *Cetonia binotata* Gory & Percheron, 1833 (subsequently designated by Mikšič); Mikšič 1970: 55 (revision), 1979b: 229 (catalogue), 1979b: 230 (in key); Sakai & Nagai 1998: 63 (iconography); Krajčič 1998: 30 (catalogue); Smetana in Löbl & Smetana 2006: 288 (catalogue); Legrand & Chew Kea Foo 2010: 13 (fauna of Sabah); Bezděk in Löbl & Löbl 2016: 373 (catalogue).

Glycyphana (Caloglycyphana) quadriguttata (Snellen van Vollenhoven, 1864)

(Figs. 1-8)

Euryomia quadriguttata Snellen van Vollenhoven, 1864: 158 (original description); Wallace 1868: 568 (catalogue). *Glycyphana quadriguttata* (Snellen van Vollenhoven): Gemminger & Harold 1869: 1311 (catalogue); Mohnike 1871: 61 (new records, new descriptions); Schoch 1896 : 62 (catalogue); Schenkling 1921: 277 (catalogue).

Glycyphana (Caloglycyphana) quadriguttata (Snellen van Vollenhoven): Mikšič 1968: 141, 1970: 80, fig.45 (revision); Sakai & Nagai 1998: 264, pl. 79, fig. 863 (1-male, 2-female) (iconography); Krajčič 1998: 31 (catalogue).

Euryomia bella Wallace, 1867: 95 (original description), 1868: 567, pl. 13, fig. 5 (catalogue) - type locality: „Batchian” (= Indonesia, Bacan Island), type material: Holotype in BMNH.

Glycyphana bella (Wallace): Gemminger & Harold 1869: 1309 (catalogue); Mohnike 1871: 61 (new records, new descriptions); Schoch 1896 : 60 (catalogue); Schenkling 1921: 271 (catalogue).

Glycyphana (Caloglycyphana) bella (Wallace): Mikšič 1968: 141, 1970b: 80, fig. 44 (revision); Krajčič 1998: 30 (catalogue) **syn. nov.**



Figs. 1-5. *Glycyphana (Caloglycyphana) quadriguttata* (Snellen van Vollenhoven, 1864): 1- habitus of male, dorsal aspect; 2- habitus of male, ventral aspect; 3- habitus of male, lateral aspect; 4- male genitalia, dorsal aspect; 5- male genitalia, lateral aspect.

Type locality. „Hab. Sumatra, Halmahera, Batjan et Morotai (= Indonesia: Sumatra, Halmahera, Bacan and Morotai Islands).

Type material. Snellen van Vollenhoven used for his description unknown number of females. Type material in RMNH?.

Additional examined material. 1 ♂, 5 ♀♀ (SJCP) labelled: Indonesia, N Moluccas / BACAN ISL., SE slopes of / Mt.Sibela, 2.-15.5., 500-750 m / 5 km SE of Makian vill., 2008/St. Jákl lgt; 6 ♀♀ (SJCP) labelled: Indonesia, N Moluccas / BACAN ISL., MAKIAN VILL. / 8.2005, local collectors lgt; 1 ♀ (SJCP) labelled: INDONESIA / Moluccen, 400 m /2.1996 / Bacan Isl. / V. Siniaev lgt; 1 ♂, 2 ♀♀ (SJCP) Indonesia, N Moluccas / MANDIOLI ISL., SW of Bacan / 12.2005, local collectors; 1 ♀ (SJCP) labelled: Halmahera / Mt.Ibu.

Distribution. Indonesia: northern part of the Moluccas: Halmahera, Bacan, Morotai, Ternate, Kasiruta and Mandioli Islands.



Figs. 6-8. *Glycyphana (Caloglycyphana) quadriguttata* (Snellen van Vollenhoven, 1864): 6- habitus of female, dorsal aspect; 7- habitus of female, ventral aspect; 8- habitus of female, lateral aspect.

Note. Study of original descriptions of *Glycyphana (Caloglycyphana) quadriguttata* Snellen van Vollenhoven and *Glycyphana (Caloglycyphana) bella* Wallace and examination of significant number of specimens of *Caloglycyphana* from the northern parts of the Moluccas revealed that *G. bella* Wallace is male sex of *Glycyphana quadriguttata* Snell. and therefore, the species are conspecific. *Glycyphana bella* Wallace is proposed to become a junior synonym of *Glycyphana quadriguttata* Snellen van Vollenhoven.

***Glycyphana (Caloglycyphana) trivittata* (Wallace, 1867)**

(Figs. 9-16)

Euryomia trivittata Wallace, 1867: 95 (original description), Wallace 1868: 565, pl. 12, fig. 8 (catalogue).

Glycyphana trivittata (Wallace): Gemminger & Harold 1869: 1311 (catalogue); Mohnike 1871: 60 (new records, new descriptions); Schoch 1896 : 63 (catalogue); Schenkling 1921: 279 (catalogue).

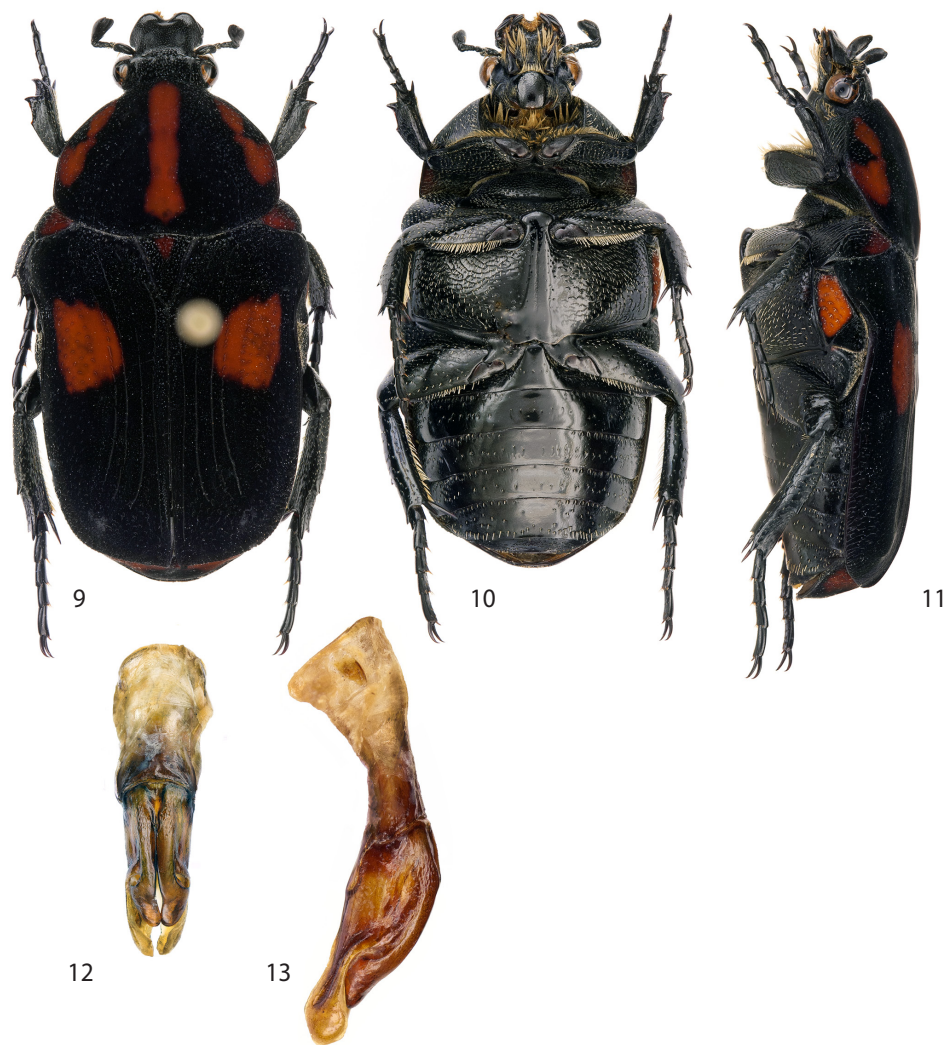
Glycyphana (Caloglycyphana) trivittata (Wallace): Mikšič 1968: 141, 1970b: 91, fig. 56 (revision); Krajčák 1998: 31 (catalogue).

Type locality. „Bourou, Moluccas” (= Indonesia, Moluccas: Buru Island).

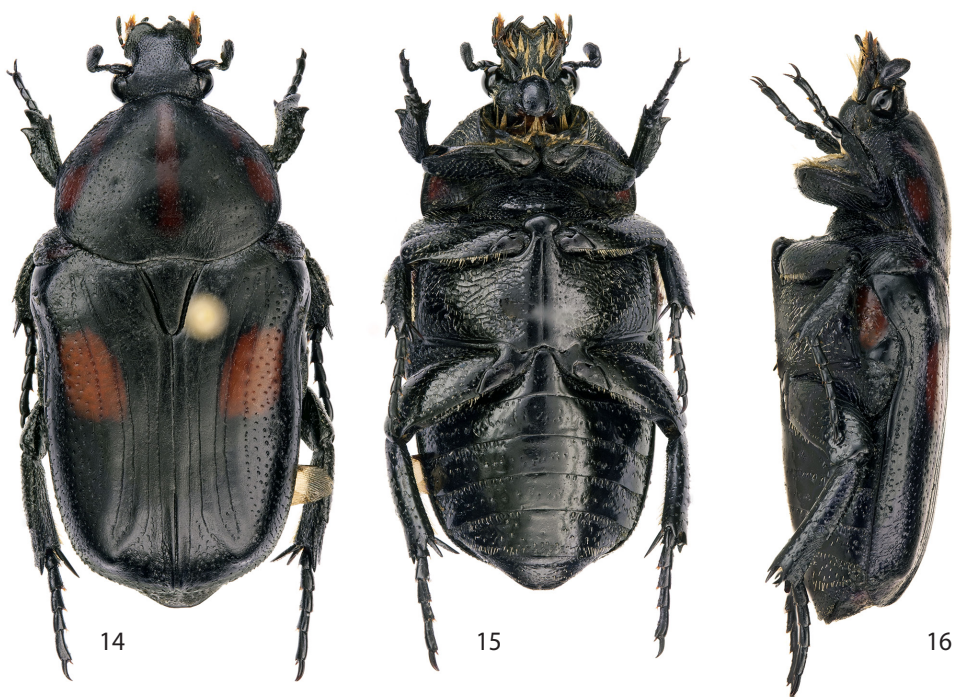
Type material. Type in BMNH.

Additional examined material. 5 ♂♂, 4 ♀♀ (SJCP) labelled: INDONESIA, C Moluccas / SEE BURU I., Ilat vill. env. / Remajah Mts., 150-350 m / 5.-18.I.2013, St.Jákl leg; 4 ♀♀ (SJCP) labelled: INDONESIA, C Moluccas / SE BURU I., 0-350 m alt. / Remajah Mts., Ilat vill. env. / VI.2013, local collector lgt; 1 ♀ (SJCP) labelled: INDONESIA, C Moluccas / BURU ISLAND, 3.1999/Local collector.

Distribution. Indonesia, the Moluccas: Buru Island.



Figs. 9-13. *Glycyphana (Caloglycyphana) trivittata* (Wallace, 1867): 9- habitus of male, dorsal aspect; 10- habitus of male, ventral aspect; 11- habitus of male, lateral aspect; 12- male genitalia, dorsal aspect; 13- male genitalia, lateral aspect.



Figs. 14-16. *Glycyphana (Caloglycyphana) trivittata* (Wallace, 1867): 14- habitus of female, dorsal aspect; 15- habitus of female, ventral aspect; 16- habitus of female, lateral aspect.

***Glycyphana (Caloglycyphana) wallacei* sp. nov.**

(Figs. 17-24)

Type locality. INDONESIA, Central Moluccas, Seram Island.

Type material. Holotype ♂ (SJCP) labelled: INDONESIA, C.Moluccas / SERAM I. / XII.2013 / local collector leg. Paratypes: (Nos. 1-2 ♂♂ and 3-4 ♀♀) (SJCP) labelled: same as holotype; (No. 5 ♂ and No. 6 ♀) (SJCP) labelled: INDONESIA, C.Moluccas / W SERAM I. / X.2013 / local collector leg; (No.7 ♀) (SJCP) labelled: INDONESIA, C.Moluccas / SERAM I., I.2013 / local collector leg; (No. 8 ♀) (SJCP) labelled: MALUKU, SERAM / Solea, 12 km SE Wahai / 17.1.-6.2.1997 / S.Bilý leg; (No. 9 ♀) (SJCP) labelled: MALUKU, Seram / Air Besar, 6 km E Wahai / 5.XI.1998 / S.Bilý leg; (No.10 ♀) (SJCP) labelled: MALUKU, Seram / Solea, 12 km SE Wahai / 16.X.-4.XI.1998 / S.Bilý leg; (Nos. 11-13 ♀♀) (SJCP) labelled: MALUKU, Seram / 6 km E Wahai, Air Besar / 22.10.1998 / J.Horák leg; (No. 14 ♂) (SJCP) labelled: Indonesia, Centr.Moluccas / Ambon Isl., Mt. Tuna / II.2010, local collectors lgt.

Description of holotype. Body length (excluding pygidium) 16.1mm, maximum humeral width 8.5 mm. Black with reddish pronotal margin, elytra and pygidium with white maculae.

Head. Black, missing basal tomentum. Frons with simple punctuation, clypeus punctuation also simple, but more dense. From level of eye canthus sharply widening, widest point shortly behind clypeal half. Apex of clypeus rounded, its apical margin deeply incised.

Antennae black and short, length of pedicle and stalk approximately same.

Pronotum. Black, circularly shaped. Margins red, except short interruption in front of anterolateral margins and in basal middle part. Anterior part of red margin distinctly narrower than rest. Black part with cover of basalic tomentum. White tomentum absent throughout pronotal length. Sides with border. Punctuation and setation absent.

Scutellum. Black, triangularly sharply shaped, whole surface with basalic tomentum. Setation and punctuation absent.

Elytra. Black, almost parallel shaped, covered with basal tomentum. Each elytron with rather small, longitudinally shaped, red macula in second interval in subscutellar part and slightly larger macula in third interval, shortly in front of apical calli. White elytral tomentum reduced into two, horizontal maculae placed approximately beside sutural ridge in apical half. Each elytron with five lines running almost throughout total length, except of fifth line, which is more fragmentally developed and present only in basal half. Sutural ridge moderately sharp, impunctate. Subhumeral emargination shallow. Sutural ridge flat, not protruding over elytral apex. Humeral and apical calli indistinct.

Pygidium. Black, basal tomentum present, base with whitish macula placed at anterolateral margin, but not bordering with lateral side of pygidium. Horizontal running wrinkles are simple and not very dense. Lateral margins with simple border.

Ventrum. Abdomen black, shining, arched. Abdominal segments 3. and 4. with whitish maculae placed near anterolateral margins. Each abdominal segment with horizontal running line of punctures, present almost throughout total length. Metasternal plate with abundant striolation, except of its narrow, glabrous middle part. Mesometasternal process black, glabrous, its structure wider than long, apex widely rounded. Prosternum and mentum black with striolation. Ventral setation whitish in metasternum and prosternum, yellowish in mentum. Setation of abdomen reduced to punctured lines of each abdominal segment.

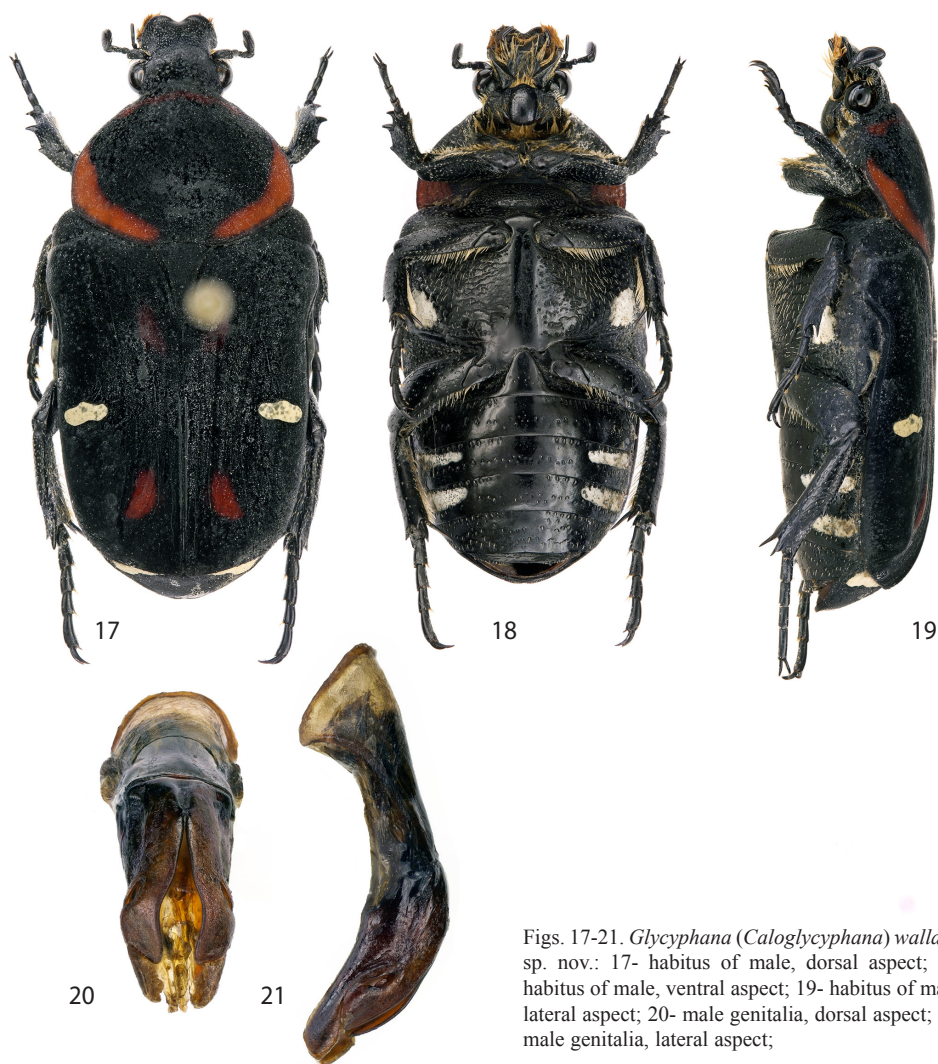
Legs. Black, moderately long. Protibia tridentate, teeth almost equidistantly developed. Meso- and metatibia with horizontal carina in apical half and yellowish setation on inner side. Femurs with setation of its posterior margins.

Genitalia. Parameres similarly developed as in other representatives of *Caloglycyphana*. In this newly described species, apical half of parameres is almost forceps shaped and both parameres are wider than in its congeners (Figs. 20-21).

Variability. Size 15-16.5 mm. Red pronotal margin is slightly variable in each specimen. Two males with interruption also in middle part of anterior pronotal margin. Size and shape of red, elytral maculae also slightly differing in each specimen.

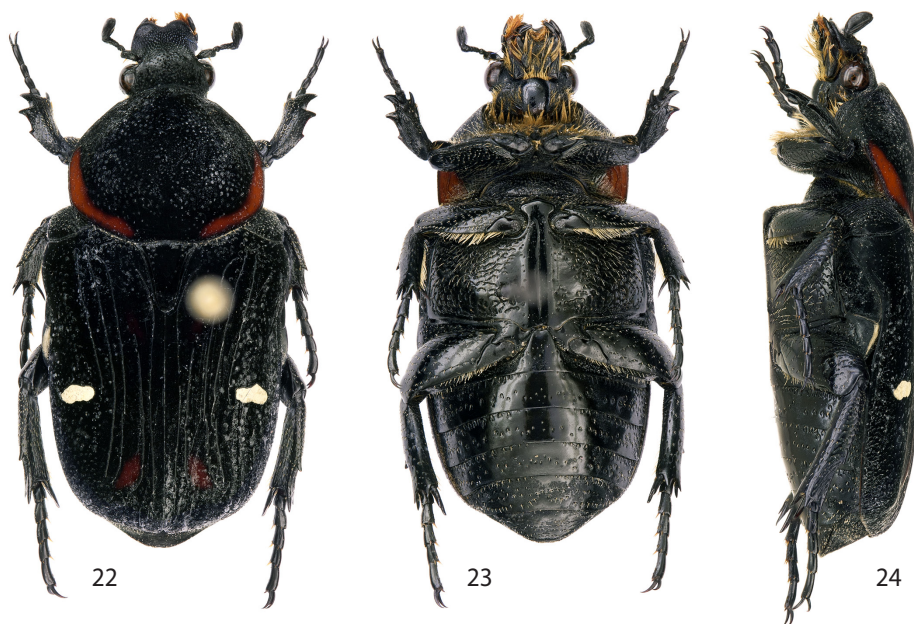
Sexual dimorphism. Size 15-16.5 mm. Females are slightly wider and more robust. Protibia also tridentate, but shorter and wider. Red, pronotal margin usually reduced to its posterolateral margins, but some specimens with similarly developed red pronotal margin as in males. Red, elytral maculae more tiny or completely missing. Sutural ridge of females with simple, but distinctly running puncture lines. White tomentum of abdomen missing in all females available for study.

Differential diagnosis. The closest congener of this newly described species is *Glycyphana* (*Caloglycyphana*) *quadriguttata* Snellen van Volenhoven, occurring in northern part of the



Figs. 17-21. *Glycyphana (Caloglycyphana) wallacei* sp. nov.: 17- habitus of male, dorsal aspect; 18- habitus of male, ventral aspect; 19- habitus of male, lateral aspect; 20- male genitalia, dorsal aspect; 21- male genitalia, lateral aspect;

Moluccas. Males of this species differ from newly described species in several characters: I. Pronotal, red marginal vitta present only in posterolateral, pronotal margins, but at least fragmentally present near all pronotal margins in the new species; II. Elytron with one reddish vitta running longitudinally throughout total elytral length, but only with red, smaller maculae in new species; III. Each elytron with whitish tomentum band running transversally (usually fragmentally) in elytral apical half, but only with one small, whitish patch in newly described species; IV. Nearly whole pygidium and each lateral margin of ventrite with yellowish to whitish tomentum, but only anterolateral part of pygidium and lateral margins of ventrite 3. and 4. with whitish tomentum in new species; V. Metasternal plate



Figs. 22-24. *Glycyphana (Caloglycyphana) wallacei* sp. nov.: 22- habitus of female, dorsal aspect; 23- habitus of female, ventral aspect; 24- habitus of female, lateral aspect.

missing any white tomentum, but with rather large, white macula in posterolateral margin of metasternum plate in new species; VI. Male parameres more straight in its apical half, but nearly forceps shaped in newly described species. Females of *Caloglycyphana quadriguttata* Snell. can be easily recognised from the new species in following respects: I. Red pronotal margin and red elytral maculae completely missing in *G. quadriguttata*, but present at least on pronotum in the newly described species; II. Coloration of transversal, elytral band canary yellow, but coloration of single, elytral macula white in new species; III. Ventrally with yellow tomentum in lateral side of each abdominal segment and mesepimeron, but without any ventral patches in new species.

From second species occurring in the region (endemic to Buru Island) *Glycyphana (Caloglycyphana) trivittata* Wallace can be new species easily recognised by presence of whitish dorsal tomentum, which is always missing in *G. trivittata*. Also different pattern, size and distribution can be considered as a good characters.

Distribution. Indonesia, Central Moluccas, Ambon and Seram Islands.

Etymology. Named after Alfred Russell Wallace, one of first explorers of the Moluccan archipelago.

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