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Revision of the Oriental species of the genus *Gnypetalia* new status (Coleoptera: Staphylinidae: Aleocharinae), with a discussion of its phylogenetic relationships

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Key words. Coleoptera, Staphylinidae, Aleocharinae, *Gnypetalia*, new species, new combinations, taxonomy, phylogeny, Oriental region

Abstract. The subgenus *Gnypetalia* Cameron, 1939 is redefined and raised to the genus rank. Eleven valid species are recognised in the genus, six of which are described as new: *Gnypetalia armata* sp. n. (Solomon Islands), *G. cuccodoroi* sp. n. (Philippines: Luzon), *G. insularis* sp. n. (Solomon Islands), *G. luzonica* sp. n. (Philippines: Luzon, Palawan), *G. nitida* sp. n. (Indonesia: Sulawesi) and *G. penrisseni* sp. n. (Malaysia: Sarawak). One new synonym is established: *Gnypetalia parva* Cameron, 1950 = *Ischnopoda* (*Caliusa*) *finitima* Pace, 1998 syn. n. Five species are given in new combination: *Gnypetalia indica* (Cameron, 1939) comb. n (= *Gnypeta* (*Gnypetalia*) *indica*), *Gnypetalia parva* (Cameron, 1950) comb. n. [= *Gnypeta* (*Gnypetalia*) *parva*], *Gnypetalia rougemontiana* (Pace, 1986) comb. n [= *Tachyusa* (*Caliusa*) *rougemontiana*], *Gnypetalia song* (Pace, 1990) comb. n. [= *Tachyusa* (*Caliusa*) *song*] and *Gnypetalia thoracica* (Fauvel, 1879) comb. n. (= *Tachyusa thoracica*). Lectotype is designated for *Gnypeta indica* Cameron, 1939. The taxa are diagnosed, keyed and illustrated. The phylogeny of the aleocharine genus *Gnypetalia* is analysed using cladistic methods. The monophyly of *Gnypetalia* is confirmed and three major monophyletic species group are recognised.

INTRODUCTION

The subgenus *Gnypetalia* was established by Cameron (1939) in the genus *Gnypeta* Thomson, 1858 to accommodate the single species *Gnypeta indica* Cameron,1939. Cameron erected the new subgenus emphasising as distinguishing character the first four abdominal tergites only transversely impressed at base.

Until now, only one other species, *G. parva* Cameron, 1950, from Malaysia, has been assigned to *Gnypetalia*.

In order to clarify the status of *Gnypetalia*, the types of *G. indica* have been reexamined. The results of this study show that *Gnypetalia* is indeed a valid genus, to which several species previously placed in the genus *Tachyusa* Erichson, 1837 can be added.

MATERIAL AND METHODS

Types and additional material from the following institutions and private collections were examined. The abbreviations cited below for each institution and private collections are used in all text citations: BMNH – The Natural History Museum, London (M.J.B. Brendell); GRPC – G. de Rougemont private collection, London; IRSNB – Institut Royal des Sciences Naturelles de Belgique, Bruxelles (D. Drugmand); ISEA – Institute of Systematics and Evolution of Animals PAS, Kraków; MHNG – Muséum d'histoire naturelle, Genève (G. Cuccodoro, I. Löbl); MSNV – Museo Civico di Storia Naturale Verona (L. Latella, R. Salmaso); MZBI – Museum Zoologicum Bogoriense, Raya Jakarta-Bogor, Cibinong, Indonesia (via M. Brendell, London); NHMW – Naturhistorisches Museum, Wien (H. Schillhammer).

Dissection of male and female genitalia, mouthparts and terminalia follows the technique of Uhlig & Watanabe (1992). Strongly sclerotised parts of body were bleached in a few drops of lactic acid, rinsed in distilled water and dehydrated in propyl alcohol until all air bubbles disappeared. Dissected parts were mounted on small plastic slides using Marc Andre No 2 medium (Massoud, 1967) and pinned together with the specimen.

Illustrations were made using a drawing tube on a Leica MZ 12.5 stereomicroscope. Illustrations were digitalised as bitmap images and subsequently modified.

Phylogenetic reconstruction was performed using PAUP version 4.0b10 (Swofford, 2001). Most parsimonious cladograms were generated by a heuristic search, with 100 replicates of random addition of taxa and tree-bisection-reconnection (TBR) branch-swapping. Clade confidence values were obtained by a bootstrap analysis with 100 replicates using heuristic searches with simple addition of taxa and TBR branch-swapping.

Twenty-three morphological characters have been analysed. For all characters, a zero indicates the hypothesised plesiomorphic state, other numerals indicate the hypothesised apomorphic state(s). Multistate characters were treated as non-additive. Unobserved character states, inapplicable or polymorphic characters were coded as missing data in the matrix.

The eleven species of *Gnypetalia* examined were included as terminals in the analysis. Representative species of *Ischnopoda* Stephens, 1837 and *Gnypeta* Thomson, 1858 were chosen as outgroups.

Characters used in the cladistic analyses are listed below. The character matrix is presented in Table 1.

Mouthparts

1. Labrum – anterior margin: (0) relatively deeply emarginate; (1) weekly emarginate.
2. Labrum – number of setae: (0) 7 or less setae on each half; (1) 9 or more setae on each half.
3. Mandible – molar tooth on right mandible: (0) small; (1) large.
4. Ligula – length: (0) long, extending to the midlength of palpomere 1; (1) short, extending to the one third of palpomere 1.
5. Ligula – apex: (0) divided to base, or near base; (1) bifid in apical half.
6. Galea length to lacinia: (0) more or less equal; (1) galea shorter than lacinia.

TABLE 1. Data matrix for eleven species of *Gnypetalia* plus two outgroup species and thirty characters used in the cladistic analysis.

Taxon	Character No.																												
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
G. carbonaria	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
I. manchurica	1	1	1	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
armata sp. n.	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	0	0	0	1	1	0	1	0	0	0	1	1	1	1	0
cuccudoroi sp. n.	1	1	1	1	1	1	1	1	2	1	0	0	0	2	0	1	1	1	1	1	0	2	1	1	1	1	1	1	0	1
indica	1	1	1	1	1	1	1	0	1	1	0	0	1	1	0	1	0	0	1	1	0	0	1	1	0	1	1	1	0	0
insularis sp. n.	1	1	1	1	1	1	1	0	0	0	1	0	0	2	1	0	0	0	0	1	0	1	0	0	0	1	1	1	1	0
luzonica sp. n.	1	1	1	1	1	1	1	0	1	1	0	0	1	0	1	1	0	0	1	1	0	0	1	1	0	1	1	1	0	0
nitida sp. n.	1	1	1	1	1	1	1	0	1	1	0	1	0	1	0	0	1	1	0	1	0	0	1	1	1	1	1	1	?	?
parva	1	1	1	1	1	1	1	0	1	1	0	0	1	0	0	1	0	0	1	1	1	0	1	1	0	1	1	1	0	0
penrisseni sp. n.	1	1	1	1	1	1	1	0	1	1	0	1	0	2	0	0	1	1	0	1	0	0	1	1	1	1	1	1	0	1
rougemontiana	1	1	1	1	1	1	1	0	1	1	0	0	1	0	0	1	0	0	1	1	1	0	1	1	0	1	1	1	0	0
song	1	1	1	1	1	1	1	0	1	1	0	0	1	1	0	1	0	0	1	1	0	0	1	1	0	1	1	1	?	?
thoracica	1	1	1	1	1	1	1	1	0	0	1	0	0	1	1	1	0	0	1	1	0	1	0	0	0	1	1	1	?	?

7. Mentum – anterior margin: (0) distinctly emarginate; (1) weekly emarginate.

Head

8. Dorsal surface: (0) convex; (1) flattened.

9. Dorsal surface: (0) not impressed medially; (1) weakly impressed medially; (2) deeply impressed medially.

10. Puncturation: (0) dense; (1) sparse.

11. Eyes in dorsal view: (0) as long as temples; (1) longer than temples.

12. Antennomere 3: (0) shorter than antennomere 2; (1) as long as antennomere 2.

13. Antennomere 4: (0) longer than wide; (1) as long as wide.

14. Antennomere 10: (0) wider than long; (1) as long as wide; (2) longer than wide.

Pronotum

15. Colour: (0) black; (1) red.

16. Pubescence at midline: (0) directed anteriorly; (1) directed posteriorly.

17. Basal transverse impression: (0) shallow; (1) deep.

18. Puncturation: (0) dense; (1) sparse.

Elytra

19. Puncturation: (0) fine; (1) minute, pinprick-like.

20. Postero-lateral angles: (0) right or weakly sinuate; (1) distinctly and deeply sinuate.

21. Length at suture: (0) as long as pronotum at midline; (1) longer than pronotum at midline.

22. Shape: (0) as long as wide; (1) wider than long; (2) longer than wide.

Abdomen

23. Tergal puncturation: (0) dense; (1) sparse.

24. Pubescence: (0) short and dense; (1) long and sparse.

25. Basal transverse impressions: (0) moderately punctate; (1) strongly punctate.

26. Widest point: (0) at level of tergites 5–6; (1) at level of tergites 6–7.

27. Tergite 7: (0) as long as tergite 6; (1) longer than tergite 6.

28. Metatarsus: (0) long, extending at least to three fourths length of metatibia; (1) short, extending at most to the midlength of metatibia.

Aedeagus

29. Base of ventral process: (0) without median process; (1) with median process.

30. Median lobe: (0) without crista apicalis; (1) with crista apicalis.

GENUS *GNYPETALIA* CAMERON, 1939 STAT. N.

(Figs 1 and 2–8)

Gnypeta (*Gnypetalia*) Cameron, 1939: 269.

Type species. *Gnypeta* (*Gnypetalia*) *indica* Cameron, 1939: 269, by monotypy.

Diagnosis

Body. Small sized, length 2.0–2.8 mm. Body slender, parallel-sided, moderately convex, shiny (Fig. 1).

Head. Circular in outline, temples broadly rounded or parallel-sided; eyes moderately protruding from lateral contours of head, genae not margined. Antennae short, distinctly widened apically, extending to base of pronotum.

Mouthparts. Maxillary palpi four-segmented (Fig. 2), palpomere 1 very short, palpomere 2 elongate, slightly widened apically, palpomere 3 longer than 2, palpomere 4 short, small, subuliform. Galea long and slender, slightly shorter than lacinia (Fig. 2). Labrum (Fig. 3) transverse, moderately arcuately emarginate apically and with characteristic arrangement of setae. Labial palpi 3-segmented (Fig. 4), palpomere 1 elongate, palpomere 2 shorter and narrower than 1, palpomere 3 narrower and much longer than 2. Ligula (Fig. 4) narrow and short, bifid from about the middle, lobes more or less parallel-sided. Mentum trapezoidal (Fig. 5), with five long setae on each side, apical margin slightly sinuate, anterior angles rounded. Mandibles curved towards apex; right mandible (Fig. 6) with distinct molar tooth at middle of inner margin, faintly serrate in dorsal molar region.

Thorax. Pronotum quadrate to slightly transverse, slightly convex, shiny, widest in apical third, lateral sides narrowed in straight line to hind angles. Hypomera fully visible in lateral view. Mesocoxae (Fig. 7) narrowly separated. Mesosternal process narrowly triangular, rounded at apex, extending to the midlength of mesocoxae and nearly reaching apex of metasternal process without isthmus (Fig. 7). Mesocoxal cavities open or close behind.

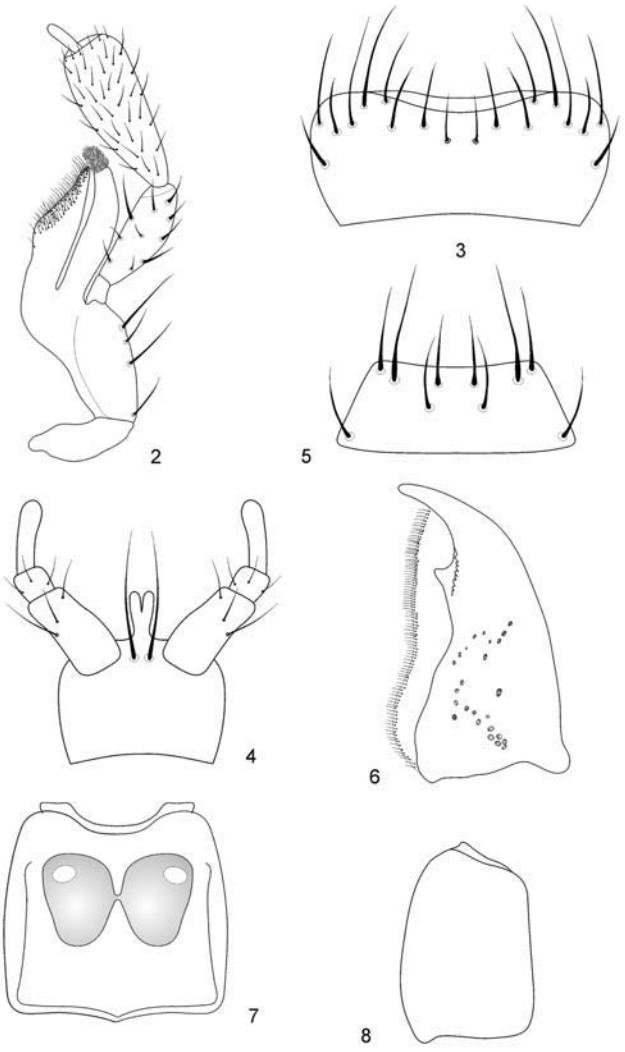
Elytra. Slightly wider than pronotum, lateral sides moderately arcuate, widest at posterior half, postero-lateral angles distinctly sinuate (Fig. 8).

Fig. 1. *Gnypetalia indica* (Cameron): habitus.

Abdomen. Moderately constricted at base, widest at level of tergites 6 and 7; bases of tergites 3–6 each with a deep transverse impression, impressions coarsely and densely punctate, interspaces between punctures forming longitudinal ridges; tergite 7 much longer than 6; sternites 3–5 moderately transversely impressed at base, impressions deeply and coarsely punctuate. Legs elongate, metatarsus relatively short, slightly exceeding to the midlength of metatibia; basal segment of metatarsus subequal in length to following two tarsal segments combined; tarsal formula 4-5-5.

Remarks. The examination of the type species of *Gnypetalia* as well as other species classified within this genus, clearly show that they form a well-defined monophyletic group characterised by several synapomorphies (see under phylogenetic part). Therefore, *Gnypetalia* is here regarded as a distinct genus.

The genus *Gnypetalia* is closely related to the genera *Tachyusa* Erichson, 1837 and *Gnypeta* Thomson, 1858. It can be easily distinguished from the *Tachyusa* by the elytral lateral sides moderately arcuate, the elytral widest point at posterior half (about middle in *Tachyusa*), the elongate tergite 7, distinctly longer than tergite 6, the abdomen widest at level of tergites 6 and 7 and by the short metatarsus, slightly exceeding to the midlength of metatibia. From the *Gnypeta* it can be distinguished by the abdomen distinctly constricted at base, the tergal transverse impressions with longitudinal ridges, the tergite 7 distinctly longer than 6, the first three sternites distinctly transversely impressed at base and by the shorter and less bifid ligula.



Figs 2–8. *Gnypetalia* sp. 2– maxilla, 3 – labrum, 4 – labium, 5 – mentum, 6 – mandible, 7 – mesosternum and metasternum, 8 – shape of elytron.

Geographic distribution. The genus is confined to the Oriental and Australian regions (Figs 33 and 34).

Key to the species of *Gnypetalia* Cameron

1 Head not impressed medially; head and abdominal puncturation dense; elytra wider than long; abdominal pubescence relatively short and dense. 2
– Head at least slightly impressed medially; head and abdominal puncturation sparse; elytra at least as long as wide; abdominal pubescence long and sparse 4
2 Head strongly flattened dorsally and with distinct microsculpture; pronotal pubescence at midline directed posteriorly; spermatheca as in Fig. 28, body length 2.6 mm. Distribution: New Guinea . . . . . *G. thoracica*
– Head convex dorsally; surface without microsculpture; pronotal pubescence at midline directed anteriorly 3
3 Eyes large, their length as seen from above longer than postocular region; elytral puncturation fine and well visible; antennomere 10 longer than wide; aedeagus as in Figs 29–30, spermatheca as in Fig. 31, body length 2.6–2.8 mm. Distribution: Solomon Islands . . . . . *G. insularis* sp. n.

– Eyes smaller, their length as seen from above subequal to that of postocular region; elytral puncturation minute, pinprick line and weakly visible; antennomere 10 as long as wide; aedeagus as in Figs 25–26, spermatheca as in Fig. 27, body length 2.0–2.1 mm. Distribution: Solomon Islands. . . . . *G. armata* sp. n.

4 Pronotal basal impression deep; pronotal puncturation relatively sparse; abdominal transverse impressions strongly punctate; antennomere 4 longer than wide. 5

– Pronotal basal impression shallow; pronotal puncturation dense; abdominal transverse impressions moderately punctate; antennomere 4 as long as wide. 7

5 Head flattened dorsally; deeply impressed medially; antennomere 3 shorter than 2; pronotal pubescence at midline directed posteriorly; aedeagus as in Figs 20–21, body length 2.7 mm. Distribution: Philippines: Luzon . . . . . *G. cuccodoroi* sp. n.

– Head convex dorsally; shallowly impressed medially; antennomeres 2 and 3 subequal in length; pronotal pubescence at midline directed anteriorly. 6

6 Head narrowly impressed medially; elytral puncturation moderately dense; antennomere 10 as long as wide; spermatheca as in Fig. 24, body length 2.5–2.6 mm. Distribution: Indonesia: Sulawesi . . . . . *G. nitida* sp. n.

– Head broadly impressed medially; elytral puncturation dense; antennomere 10 longer than wide; aedeagus as in Figs 22–23, body length 2.8 mm. Distribution: Malaysia: Sarawak. . . . . *G. penrisseni* sp. n.

7 Pronotum weakly convex; elytral length at suture as long as pronotal length at midline. 8

– Pronotum distinctly convex; elytral length at suture longer than pronotal length at midline. 10

8 Pronotum yellow; abdomen red with tergites 6–7 black; pronotal pubescence relatively sparse; antennomere 10 wider than long; aedeagus as in Figs 18–19, body length 2.1–2.2 mm. Distribution: Philippines: Luzon . . . . *G. luzonica* sp. n.

– Pronotum and abdomen reddish-brown to brown; pronotal pubescence dense; antennomere 10 as long as wide 9

9 Pronotum and tergites 3–5 reddish-brown; head circular in outline; temples broadly rounded; aedeagus as in Figs 9–10, spermatheca as in Fig. 11, body length 2.3–2.5 mm. Distribution: India . . . . . *G. indica*

– Pronotum and tergites 3–5 brown; head quadrate in outline; temples parallel-sided; spermatheca as in Fig. 17, body length 2.3–2.5. Distribution: China (Sichuan). . . . . *G. song*

10 On average smaller, length 2.0–2.2 mm; head broadly impressed medially; abdomen brown; aedeagus as in Figs 12–13, spermatheca as in Fig. 14, body length 2.0–2.2 mm. Distribution: Malaysia, China (Hong Kong) . . . . . *G. parva*

– On average larger, length 2,5 mm; head narrowly impressed medially; abdomen reddish-brown; aedeagus as in Figs 15–16, body length 2.5 mm. Distribution: Indonesia: Bali. . . . . *G. rougemontiana*

Gnypetalia indica (Cameron, 1939) comb. n.

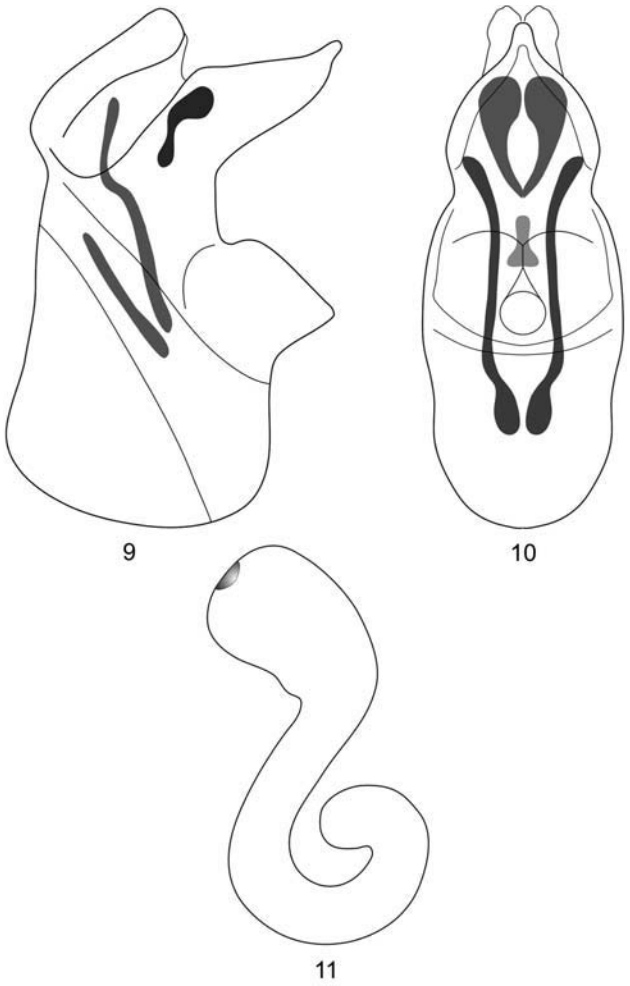
(Figs 9–11, 33)

Gnypeta (*Gnypetalia*) *indica* Cameron, 1939: 269.

Redescription

Body. Length 2.3–2.5 mm, convex, parallel-sided, shiny; ground colour brown; pronotum and tergites 3–5 reddish-brown, legs yellow, antennae brown with antennomeres 1–3 red.

Head circular in outline, convex, shiny, narrowly and shallowly impressed medially, narrower than pronotum, widest across eyes; eyes relatively small, moderately protruding from lateral contours of head, their length as seen from above subequal to that of postocular region; temples arcuately narrowed to base; head surface without microsculpture; puncturation extremely fine, pinprick-like and moderately scattered. Antennae clearly widened apically, antennomere 3 shorter than 2, antennomeres 4–10 as long as wide, antennomere 11 nearly conical.



Figs 9–11. *Gnypetalia indica* (Cameron). 9 – aedeagus (lateral view), 10 – aedeagus (ventral view), 11 – spermatheca.

Pronotum slightly transverse, about 1.24 times wider than long, convex, shiny, widest in apical third, lateral sides rounded in front, gradually narrowed in straight line to obtuse hind angles; before base with small and shallow transverse impression; surface lacking microsculpture; puncturation extremely fine, pinprick-like and dense; pubescence at midline directed posteriorly.

Elytra as long as wide, slightly wider than pronotum, at suture as long as pronotum at midline, at sides distinctly longer than pronotum at midline; surface lacking microsculpture; puncturation very minute, pinprick-like and dense.

Abdomen parallel-sided, bases of tergites 3–6 each with deep transverse impression, impressions moderately coarsely punctate, tergal puncturation very fine and rela-

tively scattered, surface without microsculpture; pubescence relatively long and relatively sparse, semierect.

Male. Aedeagus as in Figs 9–10.

Female. Spermatheca as in Fig. 11.

Remarks. *Gnypetalia indica* is closely related to *G. song* (Pace, 1990), but it differs by the paler body colour, the less convex head, the more strongly narrowed temples and by the wider pronotum.

Geographic distribution. India (Fig. 33).

Type material. Lectotype: ♂ Kolhu Khet Gad., Mussoorie Dpt., 1.xi.1921, Dr Cameron (BMNH). Paralectotype: ♀ same data as lectotype (BMNH).

Gnypetalia parva (Cameron, 1950) comb. n.

(Figs 12–14, Fig. 33)

Gnypeta (*Gnypetalia*) *parva* Cameron, 1950: 108.
Ischnopoda (*Caliusa*) *finitima* Pace, 1998: 406 syn. n.

Redescription

Body. Length 2.0–2.2 mm, convex, parallel-sided, shiny; ground colour brown; legs red, antennae brown with antennomeres 1–3 red.

Head quadrate in outline, convex, shiny, broadly and shallowly impressed medially, narrower than pronotum, widest across eyes; eyes relatively small, moderately protruding from lateral contours of head, their length as seen from above subequal to that of postocular region; temples arcuately narrowed to base; surface of head without microsculpture; puncturation extremely fine, pinprick-like and moderately scattered. Antennae clearly widened apically, antennomere 3 shorter than 2, antennomere 4 as long as wide, antennomeres 5–10 wider than long, antennomere 11 nearly conical.

Pronotum transverse, about 1.25 times wider than long, convex, shiny, widest in apical third, lateral sides rounded in front, gradually narrowed in straight line to obtuse hind angles; before base with small and shallow transverse impression; surface lacking microsculpture; puncturation extremely fine, pinprick-like and dense; pubescence at midline directed posteriorly.

Elytra as long as wide, slightly wider than pronotum, at suture longer than pronotum at midline, at sides distinctly longer than pronotum at midline; surface lacking microsculpture; puncturation fine, pinprick-like and dense.

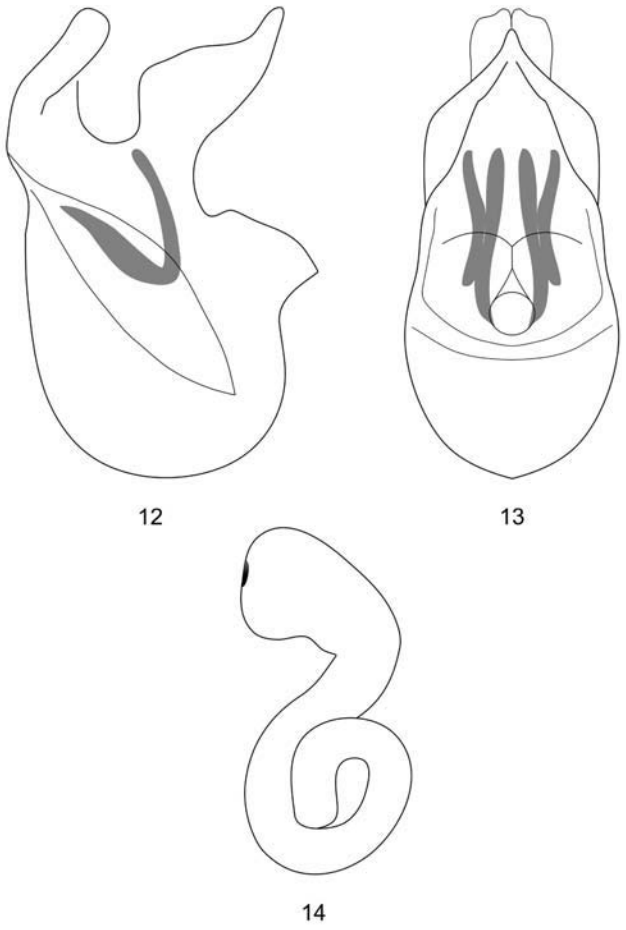
Abdomen parallel-sided, bases of tergites 3–6 each with deep transverse impression, impressions moderately coarsely punctate, tergal puncturation very fine and relatively scattered, surface without microsculpture; pubescence relatively long and relatively sparse, semierect.

Male. Aedeagus as in Figs 12–13.

Female. Spermatheca as in Fig. 14.

Remarks. *Gnypetalia parva* is very similar to *G. rougemontiana* (Pace, 1986), but it may be distinguished by its smaller size, the head more broadly impressed medially, the pronotum less strongly narrowed posteriorly and by the shape of aedeagus.

A comparison of types showed that *Gnypetalia parva* Cameron is conspecific with *G. finitima* Pace. Furthermore, no differences in the primary and secondary sexual characters were found, so that *Gnypetalia finitima* is without doubt conspecific with *Gnypetalia parva* and consequently a junior synonym of the latter.



Figs 12–14. *Gnypetalia parva* (Cameron). 12 – aedeagus (lateral view), 13 – aedeagus (ventral view), 14 – spermatheca.

Geographic distribution. Malaysia, China (Hong Kong) (Fig. 33).

Type material. *Gnypeta* (*Gnypetalia*) *parva* Cameron. Holotype: ♂ Selangor, Bukit Kutu, F.M.S., Dr. Cameron (BMNH). *Ischnopoda* (*Caliusa*) *finitima* Pace. Holotype: ♂ Hong Kong, N.T., iv.1996, de Rougemont (MHNG). Paratype: ♀ same data as holotype (GRPC).

Gnypetalia rougemontiana (Pace, 1986) comb. n.

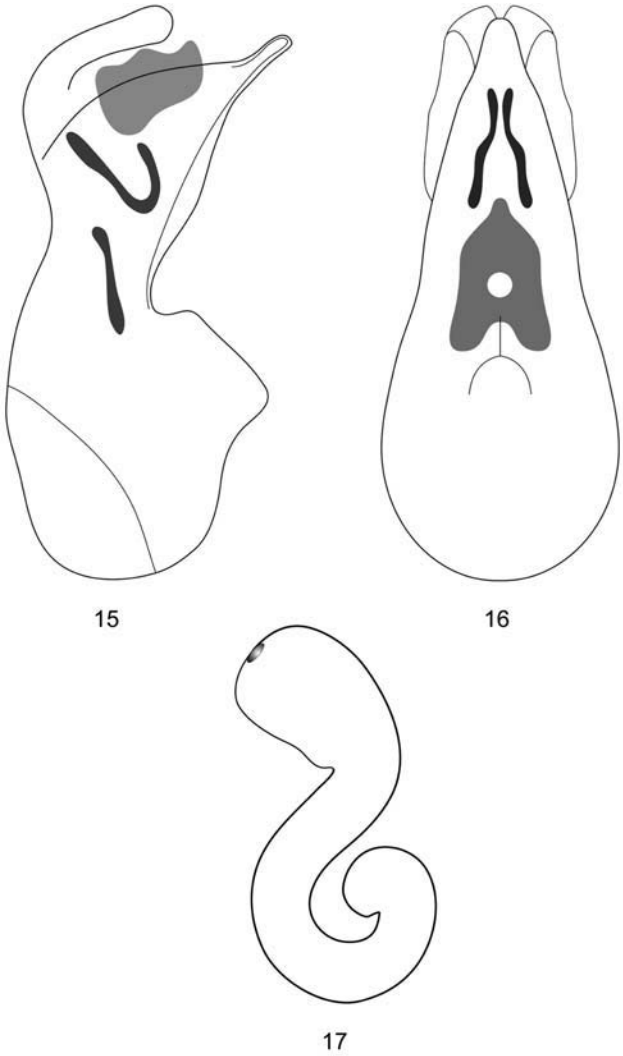
(Figs 15–16, Fig. 34)

Tachyusa (*Caliusa*) *rougemontiana* Pace, 1986: 192.

Redescription

Body. Length 2.5 mm, convex, parallel-sided, shiny; head black, pronotum and elytra dark brown, abdomen reddish-brown, legs red, antennae brown with antennomeres 1–3 red.

Head quadrate in outline, convex, shiny, narrowly and shallowly impressed medially, narrower than pronotum, widest across eyes; eyes relatively small, moderately protruding from lateral contours of head, their length as seen from above subequal to that of postocular region; temples arcuately narrowed to base; surface of head without



Figs 15–17. 15–16: *Gnypetalia rougemontiana* (Pace). 15 – aedeagus (lateral view), 16 – aedeagus (ventral view). 17 – *Gnypetalia song* (Pace): spermatheca.

microsculpture; puncturation extremely fine, pinprick-like and moderately scattered. Antennae clearly widened apically, antennomere 3 shorter than 2, antennomeres 4–5 as long as wide, antennomeres 6–10 wider than long, antennomere 11 nearly conical.

Pronotum transverse, about 1.2 times wider than long, convex, shiny, widest in apical third, lateral sides rounded in front, gradually narrowed in straight line to obtuse hind angles; before base with small and shallow transverse impression; surface lacking microsculpture; puncturation extremely fine, pinprick-like and dense; pubescence at midline directed posteriorly.

Elytra as long as wide, slightly wider than pronotum, at suture longer than pronotum at midline, at sides distinctly longer than pronotum at midline; surface lacking microsculpture; puncturation very fine, pinprick-like and dense.

Abdomen parallel-sided, bases of tergites 3–6 each with deep transverse impression, impressions moderately coarsely punctate, tergal puncturation very fine and relatively scattered, surface without microsculpture; pubescence relatively long and relatively sparse, semierect.

Male. Aedeagus as in Figs 15–16.

Female unknown.

Remarks. See under *G. parva*.

Geographic distribution. Indonesia (Bali) (Fig. 34).

Type material. Holotype: ♂ Bali, Butukaru, 18.vi.1984, leg. Rougemont (MSNV).

Gnypetalia song (Pace, 1990) comb. n.

(Fig. 17, Fig. 33)

Tachyusa (*Caliusa*) *song* Pace, 1990: 88.

Redescription

Body. Length 2.3–2.5 mm, convex, parallel-sided, shiny; ground colour brown; head and tergites 6 and 7 black, pronotum and tergites 3–5 brownish-red, legs yellow, antennae brown with antennomeres 1–3 red.

Head quadrate in outline, convex, shiny, narrowly and shallowly impressed medially, narrower than pronotum, widest across eyes; eyes relatively small, moderately protruding from lateral contours of head, their length as seen from above subequal to that of postocular region; temples parallel-sided; surface of head without microsculpture; puncturation extremely fine, pinprick-like and moderately scattered. Antennae clearly widened apically, antennomere 3 shorter than 2, antennomeres 4–10 as long as wide, antennomere 11 nearly conical.

Pronotum slightly transverse, about 1.15 times wider than long, convex, shiny, widest in apical third, lateral sides rounded in front, gradually narrowed in straight line to obtuse hind angles; before base with small and shallow transverse impression; surface lacking microsculpture; puncturation extremely fine, pinprick-like and dense; pubescence at midline directed posteriorly.

Elytra as long as wide, slightly wider than pronotum, at suture as long as pronotum at midline, at sides distinctly longer than pronotum at midline; surface lacking microsculpture; puncturation very fine, pinprick-like and dense.

Abdomen parallel-sided, bases of tergites 3–6 each with deep transverse impression, impressions moderately coarsely punctate, tergal puncturation very fine and relatively scattered, surface without microsculpture; pubescence relatively long and relatively sparse, semierect.

Male. Aedeagus lost.

Female. Spermatheca as in Fig. 17.

Remarks. See under *G. indica*.

Geographic distribution. China (Sichuan) (Fig. 33).

Type material. Holotype: ♀ China: Sichuan, Emgi Shan, 7.x.1985, de Rougemont (GRPC). Paratype: ♂ same data as holotype (aedeagus lost) (GRPC).

Gnypetalia luzonica sp. n.

(Figs 18–19, Fig. 33)

Description

Body. Length 2.1–2.2 mm, convex, parallel-sided, shiny; head dark brown, pronotum yellow, elytra

brownish-red, abdomen red with tergites 6–7 black, legs yellow, antennae brown with antennomeres 1–2 red.

Head circular in outline, convex, shiny, narrowly and shallowly impressed medially, narrower than pronotum, widest across eyes; eyes relatively small, moderately protruding from lateral contours of head, their length as seen from above subequal to that of postocular region; temples arcuately narrowed to base; surface of head without microsculpture; puncturation extremely fine, pinprick-like and moderately scattered. Antennae clearly widened apically, antennomere 3 shorter than 2, antennomere 4 as long as wide, antennomeres 5–10 wider than long, antennomere 11 nearly conical.

Pronotum transverse, about 1.2 times wider than long, convex, shiny, widest in apical third, lateral sides rounded in front, gradually narrowed in straight line to obtuse hind angles; before base with small and shallow transverse impression; surface lacking microsculpture; puncturation extremely fine, pinprick-like and dense; pubescence at midline directed posteriorly.

Elytra as long as wide, slightly wider than pronotum, at suture as long as pronotum at midline, at sides distinctly longer than pronotum at midline; surface lacking microsculpture; puncturation fine, pinprick-like and dense.

Abdomen parallel-sided, bases of tergites 3–6 each with deep transverse impression, impressions moderately coarsely punctate, tergal puncturation very fine and relatively scattered, surface without microsculpture; pubescence relatively long and relatively sparse, semierect.

Male. Aedeagus as in Figs 18–19.

Female unknown.

Remarks. *Gnypetalia luzonica* sp. n. is similar to *G. indica* Cameron, 1939 and *G. song* Pace, 1990, but it may be distinguished from both by its yellow pronotum, the transverse antennomere 10 (quadrate in *indica* and *song*), the head less impressed medially and by the denser pronotal pubescence.

Etymology. The name refers to the type locality.

Geographic distribution. Philippines (Luzon, Palawan) (Fig. 33).

Type material. Holotype: ♂ Philippines: Luzon, Los Baños, small river, 28.xi.1995, leg. Kodada & Rigova, (MHNG). Paratypes: ♂ same data as holotype (MHNG); ♂ Philippines: Palawan Central, along Tarabanan river, NE San Rafael, ca. 30 m, 7.xi.1995, leg. Kodada & Rigova (MHNG); ♂ Philippines: Luzon, Laugunas, Los Baños, vegetation debris near small river, 28.xi.1995, leg. Kodada & Rigova (ISEA).

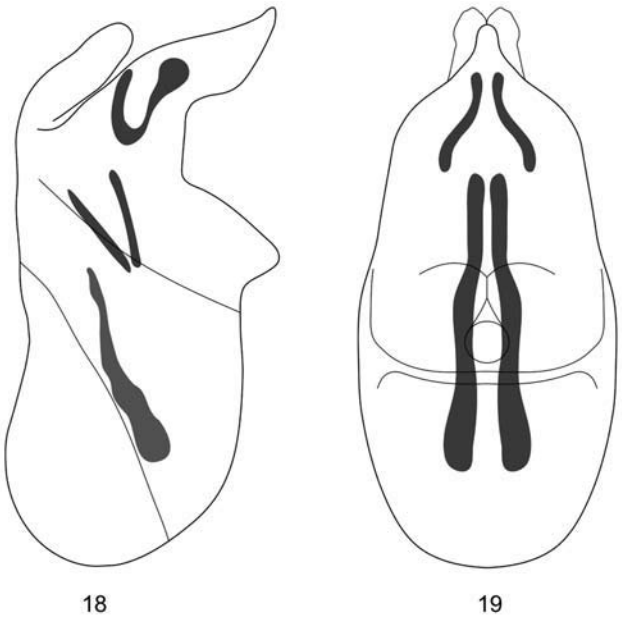
Gnypetalia cuccodoroi sp. n.

(Figs 20–21, Fig. 34)

Description

Body. Length 2.7 mm, convex, parallel-sided, shiny; head and elytra dark brown, pronotum and abdomen brownish-red, legs and antennae red.

Head quadrate in outline, flattened dorsally, shiny, moderately broadly and deeply impressed medially, narrower than pronotum, widest across eyes; eyes relatively large, moderately protruding from lateral contours of head, their length as seen from above subequal to that of postocular region; temples parallel-sided, hind angles broadly rounded; surface of head without microsculpture; puncturation very fine, pinprick-like and relatively scattered. Antennae clearly widened apically, antennomere 3 shorter than 2, antennomeres 4–10 longer than wide, antennomere 11 nearly conical.



Figs 18–19. *Gnypetalia luzonica* sp. n.. 18 – aedeagus (lateral view), 19 – aedeagus (ventral view).

Pronotum subquadrate, about 1.1 times wider than long, moderately convex, shiny, widest in apical third, lateral sides rounded in front, gradually narrowed in straight line to obtuse hind angles; before base with relatively wide and deep transverse impression; surface lacking microsculpture; puncturation very fine, pinprick-like and relatively scattered; pubescence at midline directed posteriorly.

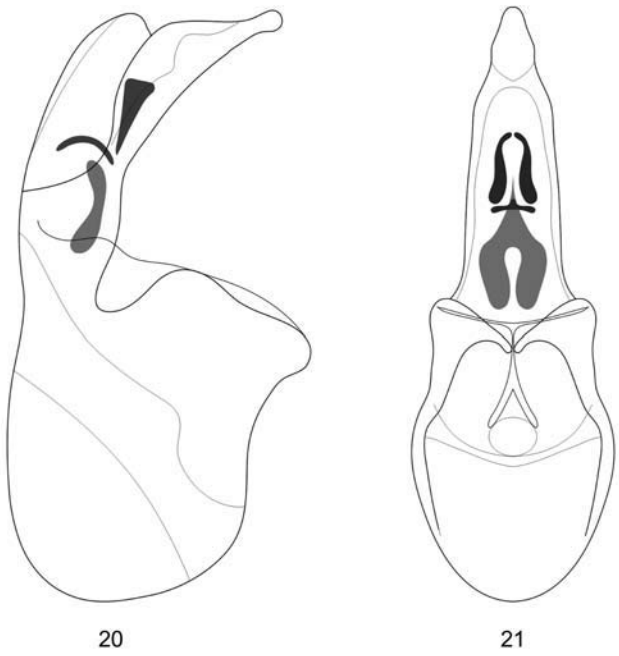
Elytra longer than wide, slightly wider than pronotum, at suture as long as pronotum at midline; at sides distinctly longer than pronotum at midline; surface lacking microsculpture; puncturation very fine, pinprick-like and dense.

Abdomen parallel-sided, bases of tergites 3–6 each with deep transverse impression, impressions coarsely and densely punctate, tergal puncturation fine and scattered, becoming denser on tergites 7–8; surface without microsculpture; pubescence relatively long and sparse, semierect.

Male. Aedeagus as in Figs 20–21.

Female unknown.

Remarks. *Gnypetalia cuccodoroi* sp. n. is similar to *G. nitida* sp. n., but it differs by the head deeply impressed medially, the antennomere 3 shorter than 2 (as long as 2 in *nitida*), the elongate antennomere 10 (quadrate in *nitida*) and by the pronotal pubescence at midline directed posteriorly.



Figs 20–21. *Gnypetalia cuccodoroi* sp. n. 20 – aedeagus (lateral view), 21 – aedeagus (ventral view).

Etymology. The species is dedicated to Giulio Cuccodoro (MHNG), specialist of Staphylinidae, who has made this material available for study.

Geographic distribution. Philippines (Luzon) (Fig. 34).

Type material. Holotype: ♂ Philippines: Luzon, Laguna, Mt. Banahaw above Kinabuhayan, 600–700 m, trail to Crystalino, 24.xi.1995, leg. J. Kodada & B. Rigova (MHNG).

Gnypetalia penrisseni sp. n.

(Figs 22–23, Fig. 33)

Description

Body. Length 2.8 mm, convex, parallel-sided, shiny; ground colour dark brown; tergites 3–4 brownish-red, legs red, antennae brown with antennomeres 1–3 red.

Head quadrate in outline, convex, shiny, broadly and shallowly impressed medially, narrower than pronotum, widest across eyes; eyes relatively large, moderately protruding from lateral contours of head, their length as seen from above subequal to that of postocular region; temples arcuately narrowed to base; surface of head without microsculpture; puncturation extremely fine, pinprick-like and moderately scattered. Antennae clearly widened apically, antennomeres 2 and 3 subequal in length, antennomeres 4–10 longer than wide, antennomere 11 nearly conical.

Pronotum transverse, about 1.2 times wider than long, convex, shiny, widest in apical third, lateral sides rounded in front, gradually narrowed in straight line to obtuse hind angles; before base with relatively wide and deep transverse impression; surface lacking microsculpture; puncturation extremely fine, pinprick-like and relatively scattered; pubescence at midline directed anteriorly.

Elytra as long as wide, slightly wider than pronotum, at suture as long as pronotum at midline, at sides distinctly longer than pronotum at midline; surface lacking microsculpture; puncturation fine and dense.

Abdomen parallel-sided, bases of tergites 3–6 each with deep transverse impression, impressions coarsely and densely punctate, tergal puncturation very fine and relatively scattered, surface without microsculpture; pubescence relatively long and relatively sparse, semierect.

Male. Aedeagus as in Figs 22–23.

Female unknown.

Remarks. *Gnypetalia penrisseni* sp. n. is very similar to *G. nitida* sp. n., but it may be distinguished by the denser elytral puncturation, the antennomere 10 longer than wide (as long as wide in *nitida*), the less convex pronotum and by the head more distinctly impressed medially.

Etymology. The name refers to the type locality.

Geographic distribution. Malaysia (Sarawak) (Fig. 33).

Type material. Holotype: ♂ Malaysia: Sarawak, ca. 80 km S Kuching, Mt. Penrissen, 1000 m, iii.1994, leg. Kodada (NHMW).

Gnypetalia nitida sp. n.

(Fig. 24, Fig. 34)

Description

Body. Length 2.5–2.6 mm, convex, parallel-sided, shiny; ground colour brown; abdomen brownish-red, legs red, antennae brown with antennomeres 1–2 red.

Head quadrate in outline, moderately convex, shiny, narrowly and shallowly impressed medially, narrower than pronotum, widest across eyes; eyes relatively small, moderately protruding from lateral contours of head, their length as seen from above subequal to that of postocular region; temples arcuately narrowed to base; surface of head without microsculpture; puncturation extremely fine, pinprick-like and moderately scattered. Antennae clearly widened apically, antennomeres 2 and 3 subequal in length, antennomeres 4–5 longer than wide, antennomeres 6–10 as long as wide, antennomere 11 nearly conical.

Pronotum transverse, about 1.2 times wider than long, convex, shiny, widest in apical third, lateral sides rounded in front, gradually narrowed in straight line to obtuse hind angles; before base with relatively wide and deep transverse impression; surface lacking microsculpture; puncturation extremely fine, pinprick-like and relatively scattered; pubescence at midline directed anteriorly.

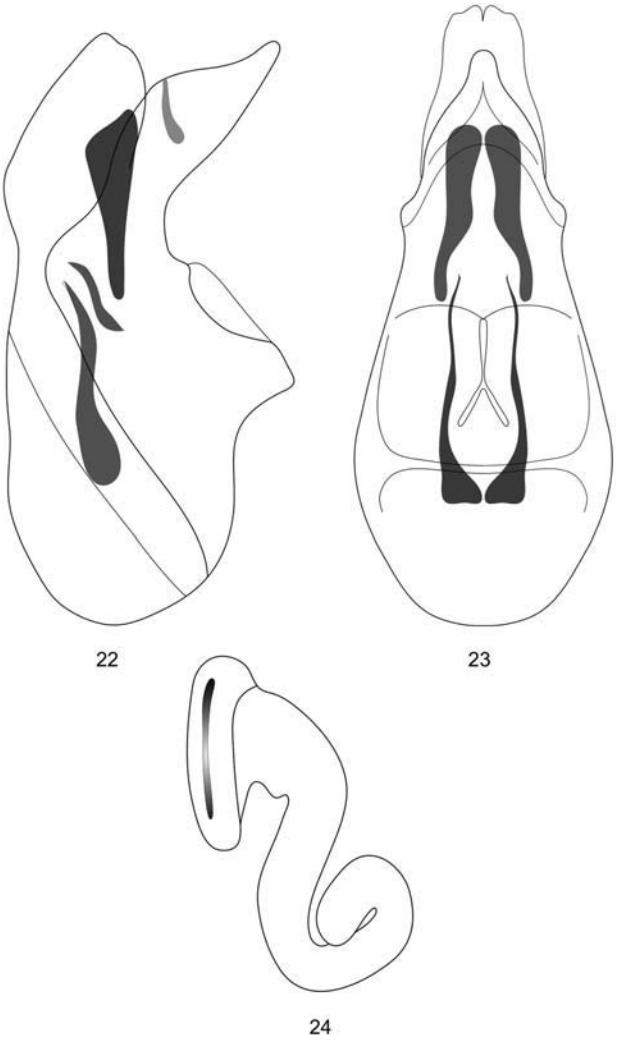
Elytra as long as wide, slightly wider than pronotum, at suture as long as pronotum at midline, at sides distinctly longer than pronotum at midline; surface lacking microsculpture; puncturation fine and moderately dense.

Abdomen parallel-sided, bases of tergites 3–6 each with deep transverse impression, impressions coarsely and densely punctate, tergal puncturation very fine and relatively scattered, surface without microsculpture; pubescence relatively long and relatively sparse, semierect.

Female. Spermatheca as in Fig. 24.

Male unknown.

Remarks. See under *Gnypetalia penrisseni*.



Figs 22–24. 22–23: *Gnypetalia penrisseni* sp. n. 22 – aedeagus (lateral view), 23 – aedeagus (ventral view). 24 – *Gnypetalia nitida* sp. n.: spermatheca.

Etymology. The new species, *nitida*, is named with reference to the distinctly shiny body.

Geographic distribution. Indonesia (Sulawesi) (Fig. 34).

Type material. Holotype: ♀ Indonesia: Sulawesi Utara, Dumoga-Bone N.P., 200–300 m, banks of R. Tumpah, i.1985 (MZBI); Paratype: ♀ same data as holotype (BMNH).

Gnypetalia armata sp. n.

(Figs 25–27, Fig. 34)

Description

Body. Length 2.0–2.1 mm, convex, parallel-sided, shiny; ground colour brown; pronotum red, tergites 6–7 black, legs red, antennae brown with antennomeres 1–2 red.

Head quadrate in outline, convex, shiny, narrower than pronotum, widest across eyes; eyes relatively small, moderately protruding from lateral contours of head, their length as seen from above subequal to that of postocular region; temples arcuately narrowed to base; surface of head without microsculpture; puncturation extremely fine, pinprick-like and dense. Antennae clearly widened apically, antennomere 3 shorter than 2, antennomeres 4–5 longer than wide, antennomeres 6–10 as wide as long, antennomere 11 nearly conical.

Pronotum transverse, about 1.2 times wider than long, convex, shiny, widest in apical third, lateral sides rounded in front, gradually narrowed in straight line to obtuse hind angles; before base with relatively small and shallow transverse impression; surface lacking microsculpture; puncturation extremely fine, pinprick-like and dense; pubescence at midline directed anteriorly.

Elytra wider than long, slightly wider than pronotum, at suture as long as pronotum at midline, at sides distinctly longer than pronotum at midline; surface lacking microsculpture; puncturation very fine, pinprick-like and dense.

Abdomen parallel-sided, bases of tergites 3–6 each with deep transverse impression, impressions moderately coarsely punctate, tergal puncturation very fine and dense, surface without microsculpture; pubescence relatively short and relatively dense, semierect.

Male. Aedeagus as in Figs 25–26.

Female. Spermatheca as in Fig. 27.

Remarks. *Gnypetalia armata* sp. n. is very similar to *G.insularis* sp. n., but it may be distinguished by the smaller eyes (as long as temples in *armata* and longer than temples in *insularis*), the antennomere 10 as long as wide (longer than wide in *insularis*), the elytral puncturation much finer and by the shape of genitalia.

Etymology. The new species, *armata*, is named with reference to the shape of aedeagus with a distinct median process.

Geographic distribution. Solomon Islands (Fig. 34).

Type material. Holotype: ♂ Solomon Islands, Kolombangara, Kuzi, camp 1, Kolombara River, 7.ix.1965 (BMNH); Paratypes: ♀ same data as holotype (BMNH); ♀ same data as holotype (ISEA); 2 ♀ Solomon Islands, San Cristoval, Warahito River, 26.vii.1965, leg. P.J.M. Greenslade (BMNH); ♂ Solomon Islands, San Cristoval, Warahito River, 30.vii.1965, leg. P.J.M. Greenslade (ISEA).

Gnypetalia thoracica (Fauvel, 1879) comb. n.

(Fig. 28, Fig. 34)

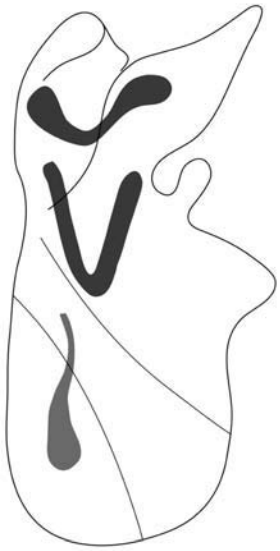
Tachyusa thoracica Fauvel, 1879 : 116.

Redescription

Body. Length 2.6 mm, convex, parallel-sided, shiny; ground colour brown; pronotum red, abdomen brown with tergites 6–7 black, legs red, antennae brown with antennomeres 1–3 red.

Head quadrate in outline, flattened dorsally, weakly shiny, narrower than pronotum, widest across eyes; eyes large, moderately protruding from lateral contours of head, their length as seen from above longer than postocular region; temples parallel-sided; surface of head with fine isodiametric mesh microsculpture; puncturation extremely fine, pinprick-like and dense. Antennae clearly widened apically, antennomere 3 shorter than 2, antennomeres 4–5 longer than wide, antennomeres 6–10 as long as wide, antennomere 11 nearly conical.

Pronotum transverse, about 1.2 times wider than long, moderately convex, shiny, widest in apical third, lateral sides rounded in front, gradually narrowed in straight line



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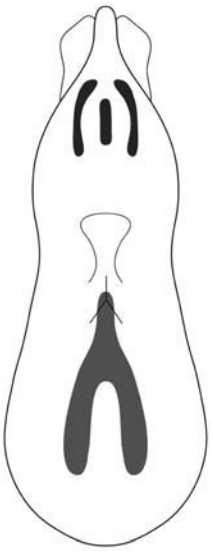

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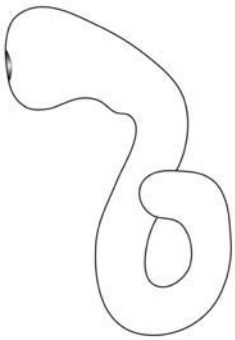

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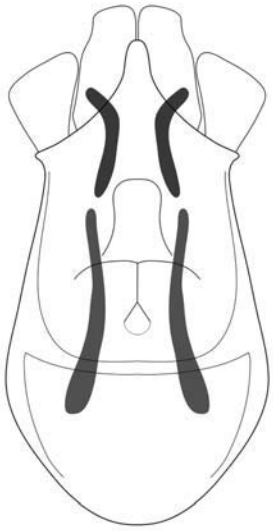
Figs 25–28. 25–27: *Gnypetalia armata* sp. n. 25 – aedeagus (lateral view), 26 – aedeagus (ventral view), 27 – spermatheca. 28 – *Gnypetalia thoracica* (Fauvel): spermatheca.

29



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31

Figs 29–31. *Gnypetalia insularis* sp. n. 29 – aedeagus (lateral view), 30 – aedeagus (ventral view), 31 – spermatheca.

to obtuse hind angles; before base with relatively small and shallow transverse impression; surface with obsolete isodiametric mesh microsculpture; puncturation extremely fine, pinprick-like and dense; pubescence at midline directed posteriorly.

Elytra wider than long, slightly wider than pronotum, at suture as long as pronotum at midline, at sides distinctly longer than pronotum at midline; surface lacking microsculpture; puncturation very fine, pinprick-like and dense.

Abdomen parallel-sided, bases of tergites 3–6 each with deep transverse impression, impressions moderately coarsely punctate, tergal puncturation very fine and dense, surface without microsculpture; pubescence relatively short and relatively dense, semierect.

Female. Spermatheca as in Fig. 28.

Male unknown.

Remarks. *Gnypetalia thoracica* is similar to *G. insularis* sp. n., but it may be distinguished by the pronotal pubescence directed posteriorly, the antennomere 10 as long as wide (longer than wide in *insularis*), the head distinctly flattened dorsally and by the distinct microsculpture of head.

Geographic distribution. New Guinea (Fig. 34).

Type material. Holotype: ♀ Nuova Guinea, Fly River, 1876–77, L.M. D'Albertis, thoracica Fvl. (IRSNB).

Gnypetalia insularis sp. n.

(Figs 29–31, Fig. 34)

Description

Body. Length 2.6–2.8 mm, convex, parallel-sided, shiny; head and elytra brown, pronotum red, abdomen reddish-brown with tergite 6 black, legs red, antennae brown with antennomeres 1–2 red.

Head quadrate in outline, convex, shiny, narrower than pronotum, widest across eyes; eyes large, moderately protruding from lateral contours of head, their length as seen from above longer than postocular region; temples arcuately narrowed to base; surface of head without microsculpture; puncturation extremely fine, pinprick-like and dense. Antennae clearly widened apically, antennomere 3 shorter than 2, antennomeres 4–10 longer than wide, antennomere 11 nearly conical.

Pronotum transverse, about 1.2 times wider than long, convex, shiny, widest in apical third, lateral sides rounded

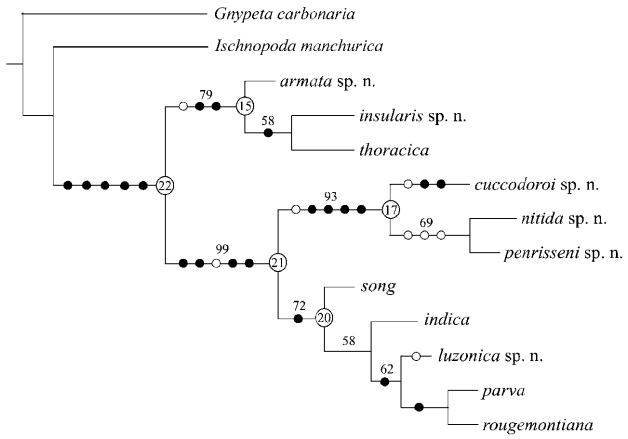

Fig. 32. Single most parsimonious cladogram generated for *Gnypetalia* (length = 42; CI = 0.78; RI = 0.84). Homoplasious character state transformations indicated by open circles, synapomorphies by black circles. Bootstrap values are given for nodes with 50% or higher bootstrap support.

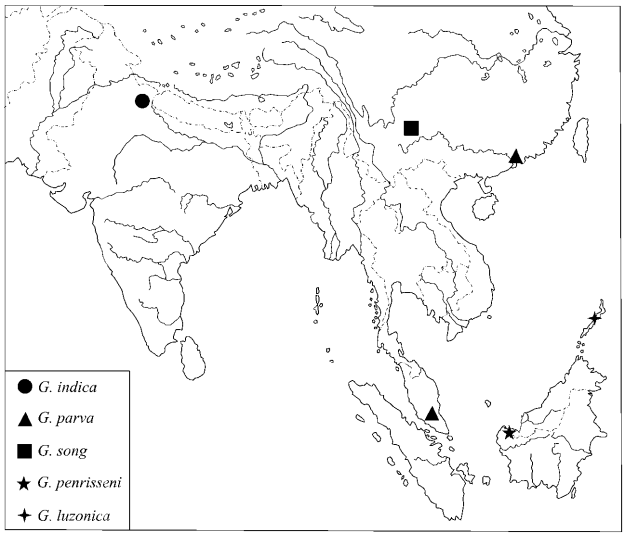

Fig. 33. Geographic distribution of *Gnypetalia* species.

in front, gradually narrowed in straight line to obtuse hind angles; before base with relatively small and shallow transverse impression; surface lacking microsculpture; puncturation extremely fine, pinprick-like and dense; pubescence at midline directed anteriorly.

Elytra wider than long, slightly wider than pronotum, at suture as long as pronotum at midline, at sides distinctly longer than pronotum at midline; surface lacking microsculpture; puncturation fine and dense.

Abdomen parallel-sided, bases of tergites 3–6 each with deep transverse impression, impressions moderately coarsely punctate, tergal puncturation very fine and dense, surface without microsculpture; pubescence relatively short and relatively dense, semierect.

Male. Aedeagus as in Figs 29–30.

Female. Spermatheca as in Fig. 31.

Remarks. See under *G. armata* and *G. thoracica*.

Etymology. The name (Latin insula = island) refers to the type locality.

Geographic distribution. Solomon Islands (Fig. 34).

Type material. Holotype: ♂ Solomon Islands, Guadalcanal, Nalimbiur, 1.iii.1963, leg. P. Greenslade, "*Gnypetalia islandica* sp. n., det. G. Pasnik 2004" (BMNH); Paratypes: ♀ same data as holotype (BMNH); ♂ and ♀ same data as holotype (ISEA).

PHYLOGENY

Cladistic analysis resulted in a single most parsimonious cladogram with a length of 35 steps, consistency index (CI) of 0.74 and retention index (RI) of 0.83 (Fig. 32).

The monophyly of the genus *Gnypetalia* is well demonstrated, being strongly supported by five synapomorphies (Fig. 32): the ligula short, extending to the one third of palpomere 1 (character 4), the elytral postero-lateral angles distinctly and deeply sinuate (character 20), the abdomen widest at level of tergites 6–7 (character 26), the tergite 7 longer than tergite 6 (character 27) and the metatarsus short, extending at best to 1/2 of metatibia (character 28). These characters represent apomorphies supporting the genus.

Three groups were recovered in the analysis. The first are the species united at node 15 (Fig. 32). The monophyly of the group is supported by three characters (15, 22, 29), two of which represent synapomorphies: the elytra wider than long (character 22) and the ventral process of aedeagus with median process (character 29). A single exception is in character 15, which shows a homoplasy to *G. luzonica* in the third clade.

The second group united at node 17 (Fig. 32) includes three species. This group is one of the most characteristic and recognisable groups of *Gnypetalia*. The monophyly of this group is supported by five characters, four of which represent synapomorphies: the pronotal basal impression deep (character 17), the pronotal puncturation sparse (character 18), the abdominal transverse impressions strongly and deeply punctate (character 25) and the

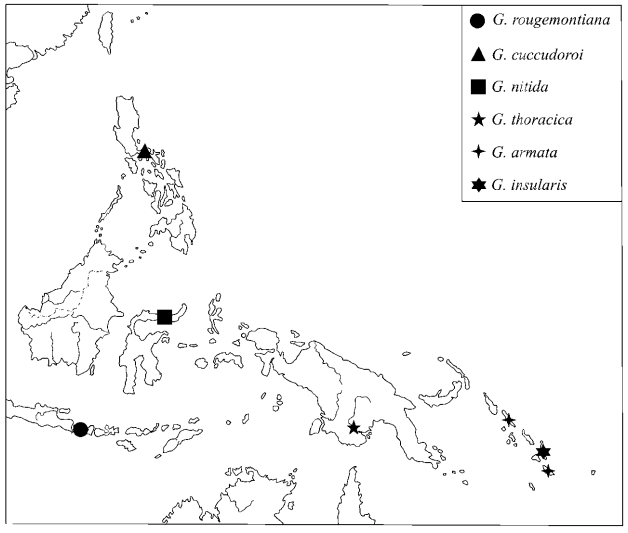

Fig. 34. Geographic distribution of *Gnypetalia* species.

median lobe of aedeagus with crista apicalis (character 30).

The third large group united at node 20 (Fig. 32) is composed of five species. The group is defined by a single synapomorphy: the antennomere 4 as long as wide (character 13).

Character analysis demonstrated that *Gnypetalia* shows an intermediate stage between *Gnypeta* and *Tachyusa*. The abdomen distinctly constricted at base, the tergal transverse impressions coarsely punctate, the punctures in tergal impressions separated by longitudinal ridges and the first three sternites distinctly transversely impressed at base exhibit patterns similar to the *Tachyusa* species. On the other hand, the elytral lateral sides moderately arcuate, the elytral widest point at posterior half and the short metatarsus point out the relationships with the species of the *Gnypeta*. Cladistic analysis suggests that this group represents a separate monophyletic genus. The sister group of the *Gnypetalia* and its systematic position within Tachyusini will be presented in the generic revision of Tachyusini (Paśnik, in prep.)

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