

Systematic revision of the genus *Graphelmis* (Coleoptera: Elmidae) V. *Graphelmis picta* species group

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ČIAMPOR JR., F. & KODADA, J. 2004. Systematic revision of the genus *Graphelmis* (Coleoptera: Elmidae) V. *Graphelmis picta* species group. *Entomol. Probl.* 34(1–2): 55–102. – The fifth and largest new species group *Graphelmis picta* is designated within the genus *Graphelmis* DELÈVE, 1968, comprising nine known and twenty five new species: *G. picta* (REITTER, 1886), *G. biroi* (BOLLOWS, 1942), *G. verpa* JÄCH, 1985, *G. binervosa* (REITTER, 1886), *G. diaphoroderes* JÄCH, 1985, *G. lomata* JÄCH, 1985, *G. oxytela* JÄCH, 1985, *G. pallidipes* (CARTER, 1926), *G. palawanensis* sp.nov., *G. ceylonica* (MOTSCHULSKY, 1859), *G. loebli* sp.nov., *G. jendeki* sp.nov., *G. kubani* sp.nov., *G. convexa* sp.nov., *G. balkei* sp.nov., *G. clava* sp.nov., *G. riberai* sp.nov., *G. picea* sp.nov., *G. vogleri* sp.nov., *G. basalis* sp.nov., *G. hlavaci* sp.nov., *G. securipes* sp.nov., *G. strbaki* sp.nov., *G. tuberculata* sp.nov., *G. philemoni* sp.nov., *G. togianica* sp.nov., *G. posoica* sp.nov., *G. reitteri* sp.nov., *G. insolita* sp.nov., *G. darwini* sp.nov., *G. schneideri* sp.nov., *G. jesusi* sp.nov., *G. bruneica* sp.nov., *G. gibberosa* sp.nov. Habitus and detail drawings of characteristic structures of genitalia, pregenital segments and male metatibiae are given.

Key words: Coleoptera, Elmidae, *Graphelmis*, taxonomy, south-east Asia.

Introduction

This study represents the fifth part of the revision of the genus *Graphelmis* DELÈVE, 1968. The *Graphelmis picta* species group, which is the most diverse group within the genus, is designated. This group includes nine already known and 25 newly described species, which is more than 40% of all examined *Graphelmis* species. As the largest group, it also has the widest area of distribution, extending from Sri Lanka in the west through the central part of south-east Asia and the Sunda Islands to New Guinea and north-east Australia. The majority of the species (21) occurs in New Guinea (Irian Jaya and Papua New Guinea), eleven species occur in the central part of south-east Asia (Laos, Thailand, Vietnam, Borneo, Palawan, Siberut, Sumatra, Sulawesi), one species in Sri Lanka and one in Australia, respectively.

Material and methods, as well as the acronyms and symbols used, follow ČIAMPOR (2001).

Diagnosis of the *Graphelmis picta* species group

Within the genus, the *G. picta* species group is characterized by the following features: 1) elongate body shape (CL/EW around 2.51); 2) median pronotal groove usually large with more or less raised lateral margins; 3) posterior sublateral pronotal tubercles carinate; 4) elytral intervals 3, 5 and 7 moderately raised; 5) apical portion of elytral interval 2 raised; 6) elytral punctures deeply impressed, usually coarser than interstices; 7) dorsal surface usually matt; 8) mesosternum without oblique carinae; 9) abdomi-

nal intercoxal process without sublateral carinae; 10) male metatibiae excavated near apex, widened or curved with tuft of moderately long adpressed setae and more or less distinct apical spine; 11) penis slender, with base moderately produced in lateral view; 12) membranous endophallus with distinct sclerites; 13) phallobasis extremely short.

Many species of the *G. picta* species group are very similar to each other. The general appearance as well as male genitalia are often almost identical among species, but the combination of characters such as habitus, colour pattern, form and size of genitalia and apex of male metatibiae is always unique for species.

Graphelmis picta (REITTER, 1886)

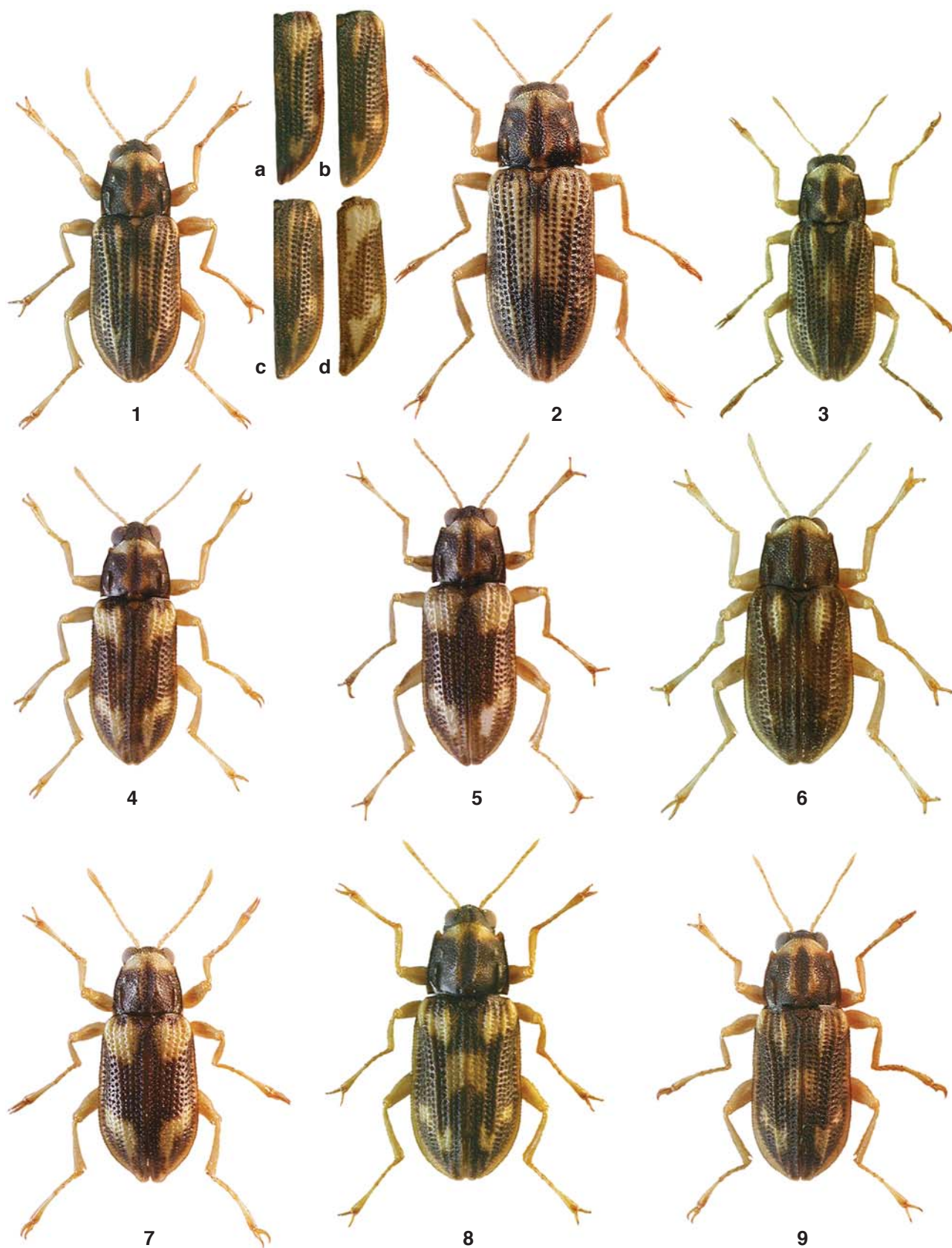
(Figs 1, 10–13, 139)

Stenelmis pictus REITTER, 1886: 213

Graphelmis picta DELÈVE, 1970: 254–257, Figs 16–18

Type locality: Sumatra: Soekadana, Lampongs.

Material examined. (NMW, CKB): 2ex.: “Grouvelle Palembang Sumatra”; 12♂♂, 18♀♀: “SUMATRA: 4.4.1997 2°49’N 99°18’E Kebun Sei Kopas, 200m leg. Malicky”; 2♀♀: “NW-THAL.: Ban Mae Kap Nam Mae To, 600m, LF 98°37’E 18°51’N 14.3.1992 leg. Malicky”; 10♂♂, 16♀♀: “N-SUMATRA 1991 Bukit Maratya 200m leg. Malicky 19.II.”; 3♂♂, 3♀♀: “N-SUMATRA 19.2.91 Bukit Maratya 99°14’E 13°00’N River Bahapal at light 200m leg. Malicky”; 1♂, 2♀♀: “N-SUMATRA Dolok Merangir leg. Malicky 4.III.”; 2♂♂, 1♀: “N-SUMATRA Dolok Merangir leg. Malicky 21.II.”; 1♀: “N-SUMATRA 99°11’E 3°07’N Dolok Merangir 21.2.1991 leg.



Figs 1–9 Habitus of: 1) *Graphelmis picta* (REITTER) [a–d variations of elytral marking]; 2) *Graphelmis pallidipes* (CARTER); 3) *Graphelmis kubani* sp.nov.; 4) *Graphelmis palawanensis* sp.nov.; 5) *Graphelmis bruneica* sp.nov.; 6) *Graphelmis jendeki* sp.nov.; 7) *Graphelmis gibberosa* sp.nov.; 8) *Graphelmis philemoni* sp.nov.; 9) *Graphelmis darwini* sp.nov.

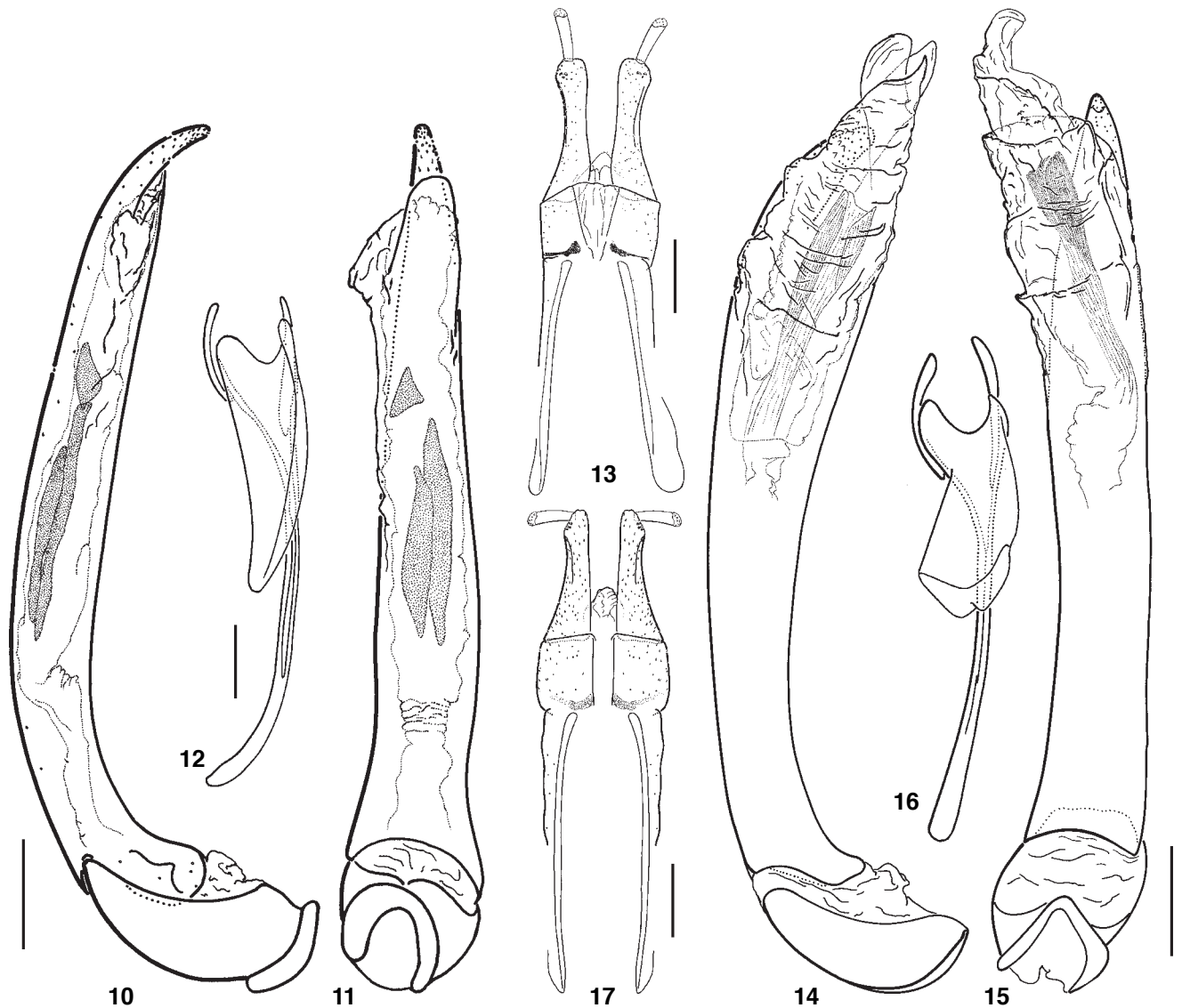
Malicky“; 9♂♂, 12♀♀: “N-SUMATRA 91 Huta Padang leg. Malicky 2.III.”; 1♂, 2♀♀, 4ex.: “N-SUMATRA: 17.2. Huta Padang, 400m ca. 99°14'E 2°45'N leg. Malicky 1994”; 2♂♂, 6♀♀, 1ex.: “N-SUMATRA 98°57'E 3°09'N Simarito 400m 3.3.1991 leg. Malicky”; 1♀, 4ex.: “INDON. Sumatra Utara 99°14'E 02°45'N Huta Padang 400m II.1991, leg. Malicky”; 4♂♂, 13♀♀, 3ex.: “N-SUMATRA; Aek Tarum 99°18'30"E 2°40'32"N 21.2.1994, 180m leg. Malicky”; 3♂♂, 2♀♀, 2ex.: “SUMATRA: 19.4.1997 Tinggi Raja, 350m 3°09'N 98°47'E leg. Malicky”; 1♂, 8♀♀: “INDONESIEN 1991 (22) Siberut, Toteburu-Bakeuluk leg. Jäch 17.2.”; 6♂♂, 6♀♀: “SUMATRA: 02°59'N 97°23'E Aceh Kruek Selatan NP 13km N Bakongan 6.4.1997, leg. Malicky”; 9♂♂, 6♀♀, 1ex.: “SUMATRA: Aceh 5.-8.2.1994 Gg. Leuser NP, Ketambe ca. 03°40'N 97°40'E 400m, leg. Malicky”; 1♂, 3♀♀: “INDONESIEN 1991 Siberut (22) leg. Schödl 17.2.”; 4♂♂, 3♀♀, 1ex.: “SUMATRA 15.4.1997 15km N Syndar Raya Simarito, 3°05'N 98°53'E 400m, leg. Malicky”; 7♂♂, 8♀♀: “SUMATRA: Aceh, 8.4.1997 Kreun Luas, 10m 02°51'N 97°45'E leg. Malicky”.

Diagnosis. Within the *G. picta* species group, *G. picta* (REITTER) is characterized by: 1) clypeus, frons and vertex microreticulate; 2) apical spine of male metatibiae moderately large with apex truncate; 3) penis short, with base widely produced in lateral view.

Redescription. Body form elongate (Fig. 1); CL in ♂♂ (1.75–2.05 mm, $\bar{S}=1.94\pm0.10$), in ♀♀ (2.00–2.25 mm, $\bar{S}=2.13\pm0.07$); EW in ♂♂ (0.77–0.87 mm, $\bar{S}=0.81\pm0.03$), in ♀♀ (0.85–0.92 mm, $\bar{S}=0.89\pm0.03$), CL/EW in ♂♂ (2.28–2.60, $\bar{S}=2.40\pm0.11$), in ♀♀ (2.28–2.52, $\bar{S}=2.39\pm0.09$).

Colour pattern: pronotum black with yellowish anterior margin and feebly yellowish lateral margins of median groove; elytra vary in coloration (Figs 1a–d).

Head. HW in ♂♂ (0.41–0.48 mm, $\bar{S}=0.45\pm0.02$), in ♀♀ (0.43–0.48 mm, $\bar{S}=0.47\pm0.02$); ID in ♂♂ (0.22–0.28 mm, $\bar{S}=0.24\pm0.01$), in ♀♀ (0.24–0.28 mm,



Figs 10–17. 10–13 *Graphelmis picta* (REITTER): 10) aedeagus ventral view; 11) aedeagus lateral view; 12) spiculum gastrale and sternite 9; 13) ovipositor; 14–17 *Graphelmis kubani* sp.nov.: 14) aedeagus ventral view; 15) aedeagus lateral view; 16) spiculum gastrale and sternite 9; 17) ovipositor. Scale bars: 0.1mm.

$\S = 0.27 \pm 0.01$); ED in ♂♂ (0.21 – 0.24 mm, $\S = 0.23 \pm 0.01$), in ♀♀ (0.21 – 0.24 mm, $\S = 0.23 \pm 0.01$); HW/ID in ♂♂ (1.63 – 2.08, $\S = 1.86 \pm 0.12$), in ♀♀ (1.56 – 1.93, $\S = 1.76 \pm 0.10$). Labrum with setigerous punctures in anterior half, posterior half glabrous, anterior margin paler; clypeus shorter than labrum, microreticulate; fronto-clypeal suture narrow; frons and vertex microreticulate with short pale setae; eyes large, oval in lateral view and convex in dorsal view, with more or less raised margins.

Thorax. Pronotum slightly wider than long, widest in basal half; PL in ♂♂ (0.50 – 0.60 mm, $\S = 0.58 \pm 0.04$), in ♀♀ (0.60 – 0.65 mm, $\S = 0.62 \pm 0.03$); PW in ♂♂ (0.55 – 0.66 mm, $\S = 0.60 \pm 0.03$), in ♀♀ (0.62 – 0.72 mm, $\S = 0.68 \pm 0.03$); AP in ♂♂ (0.45 – 0.50 mm, $\S = 0.48 \pm 0.01$), in ♀♀ (0.50 – 0.55 mm, $\S = 0.53 \pm 0.02$); lateral margins explanate; anterior angles produced; anterior sublateral tubercles small, almost rounded; posterior tubercles almost half as long as PL, carinate, reaching posterior margin; median groove large; lateral margins of groove raised; prebasal admedian pits small; surface microreticulate, tubercles and margins of groove almost glabrous with pale setae. Prosternum with disc glabrous in anterior half and microreticulate in posterior half; prosternal process microreticulate, with lateral margins narrow, slightly raised; posterior margin with narrow, slightly projected median protuberance. Scutellum subtriangular, flat; anterior half glabrous, posterior half moderately densely micropunctured. Mesosternum deeply impressed mesally, without oblique microreticulate carinae; surface microreticulate. Metasternum about twice as long as mesosternum; disc slightly convex in anterior third and shallowly depressed along longitudinal suture in posterior two-thirds, depression distinctly narrower in females; admedian prebasal punctures absent; sublateral carinae absent; surface covered by plastron structures except of glabrous depressed portion of disc; disc of males with longer yellowish setae. Elytra parallel-sided in about anterior two-thirds, then continuously converging toward feebly produced apices; EL in ♂♂ (1.20 – 1.45 mm, $\S = 1.36 \pm 0.08$), in ♀♀ (1.40 – 1.60 mm, $\S = 1.51 \pm 0.06$); lateral margins explanate and finely serrate; striae punctures large, more deeply impressed on sides; interval 3 feebly raised anteriorly, intervals 5 and 7 feebly raised; surface rough with sparse short setae. Legs yellow; femora almost glabrous or finely microreticulate; tibiae finely micropunctured and grooved; FT in ♂♂ (0.48 – 0.55 mm, $\S = 0.53 \pm 0.02$), in ♀♀ (0.52 – 0.59 mm, $\S = 0.56 \pm 0.02$); MT in ♂♂ (0.48 – 0.59 mm, $\S = 0.53 \pm 0.03$), in ♀♀ (0.52 – 0.60 mm, $\S = 0.56 \pm 0.03$); apex of male metatibiae (Fig. 139); HT in ♂♂ (0.52 – 0.62 mm, $\S = 0.58 \pm 0.03$), in ♀♀ (0.59 – 0.66 mm, $\S = 0.61 \pm 0.03$); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process almost flat; mesal portion of process and disc of ventrites microreticulate; lateral portions of process and ventrites covered by plastron structures; apex of ventrite 5 deeply mesally excavated, with sides produced posteriad. Sternite 9 and spiculum gastrale (Fig. 12).

Aedeagus (Figs 10, 11). Penis short and slender, in lateral view curved apically and basally, base distinctly produced ventrad, rounded; penis in ventral view parallel-sided; membranous endophallus with two long and one shorter sclerites; phallobasis short, nearly 0.33× as long as penis.

Ovipositor (Fig. 13) with terminal segment slender, almost straight; preterminal segment about 3× as long as terminal, outer side concave; distal sclerite subquadrate, about 0.6× as long as preterminal; basal segment about 1.35× as long as preterminal and distal sclerites combined; ventral fulcrum slightly curved.

Sexual dimorphism. Males are distinguished by modified metatibial apices, yellow setae on disc of metasternum and by more produced sides of apical emargination of ventrite 5.

Distribution. Thailand, Sumatra, Siberut (Indonesia).

Graphelmis binervosa (REITTER, 1887)

Stenelmis binervosus REITTER, 1887: 259

Stenelmis binervosa GROUVELLE, 1896: 50

Graphelmis binervosa DELÈVE, 1970: 257–258.

Type locality: Papua New Guinea, Fly River.

Material examined. **Holotype** ♀ (MNHN): “Cn. Reitter, type / Nuova Guinea - Fly River - L.N.: D’Albertis, 1876-1877”.

Diagnosis. *G. binervosa* is slightly larger than *G. picta*; with darker coloration, less distinct yellow marking and dark brown tarsi and antennae; elytra with larger prebasal yellowish maculae from sutural interval reaching lateral sides, small subapical spots on interval 5 and narrow yellowish serrate lateral margins.

Redescription. Body form elongate (CL 2.25 mm). Colour pattern: pronotum black with yellowish anterior margin, lateral margins of median groove inconspicuously lighter than disc; elytra with yellowish prebasal transverse stripe and pair of narrow longitudinal yellowish stripes in basal third.

Head black. Labrum brown, finely plicate, depressed on internal margin of eyes; clypeus shorter than labrum; fronto-clypeal suture narrow; eyes large, oval in lateral view and convex in dorsal view.

Thorax. Pronotum as wide as long (PW, PL 0.63mm), lateral sides converging anteriorly (AP 0.5mm); reticulation more distinct; lateral margins explanate; anterior angles produced; anterior sublateral tubercles inconspicuous; posterior tubercles almost half as long as PL, carinate; median groove large; lateral margins of groove raised. Prosternum: prosternal process plicate. Metasternum divided by longitudinal suture in whole length; disc without setigerous punctures. Elytra 2.5× as long as pronotum, about 2× longer than wide parallel-sided in about anterior two-thirds, then continuously converging toward feebly produced apices (EL 1.55mm, EW 0.8mm); striae of punctures distinct, punctures large, more deeply impressed on sides; interval 3 widened and raised prebasally (in yellow coloured portion); intervals 5 and 7 feebly raised; lateral margins

explanate and finely serrate; surface rough with sparse short setae. Ventral side dark brown, finely reticulate. Legs yellow; femora almost glabrous or finely microreticulate; tibiae finely micropunctured and grooved; length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Ventrites 1–4 with same but more distinct median longitudinal stripe as in *G. picta*.

Aedeagus unknown.

Sexual dimorphism. Only single female holotype is known described.

Distribution. Papua New Guinea.

Note. There is only one female (holotype) known from this species, deposited in the Natural History museum in Paris. We were not allowed to remove the specimen from the card, so the redescription is a compilation of our examination and that of DELÈVE (1970). We did not use the description of REITTER (1887) as a source of information about this species because of its extreme brevity.

Graphelmis pallidipes (CARTER, 1926)

(Figs 2, 140)

Helms pallidipes CARTER, 1926: 63

Stenelmis pallidipes CARTER & ZECK, 1929: 70, Figs 9, 39

Graphelmis pallidipes JACH, 1984: 288.

Type locality: New South Wales; Queensland: Cairns district

Material examined. (NMW): 1 ♂: “AUSTRALIA QLD, 2.2.82 J. Sedlacek leg., Ex. coll. Hebauer”; 1 ♀: “AUSTRALIA: QLD., 6.4.1997 Palmerston NP., light Henrietta Ck. camp 17°36'S 145°46'E, P. Zwick”; 1 ex.: “TULLY F., Q, 31.1.82, J. Sedlacek Collector”

Diagnosis Within the *G. picta* species group, *G. pallidipes* differs as follows: 1) occurs only in Australia; 2) aedeagus long and distinctly slender; 3) metatibiae of males widely shallowly excavated preapically, with short adpressed setae above excavation.

Redescription. Body form elongate (Fig. 2); CL in ♂ 2.46 mm, in ♀ 2.64 mm; EW in ♂ 0.95 mm, in ♀ 1.00 mm, CL/EW in ♂ 2.59, in ♀ 2.64.

Colour pattern: pronotum with yellowish anterior margin; sublateral tubercles and narrow margins along median longitudinal groove; elytra with more or less distinct V-shaped marking in anterior part extending midlength, almost whole interval 5, short bands on intervals 7 and 9 in posterior half and apical portions of interval 2.

Head. HW in ♂ 0.53 mm, in ♀ 0.56 mm; ID in ♂ 0.25 mm, in ♀ 0.29 mm; ED in ♂ 0.24 mm, in ♀ 0.26 mm; HW/ID in ♂ 2.12, in ♀ 1.90. Labrum very finely microreticulate, anterior two-thirds sparsely setose, anterior margin paler; clypeus as long as labrum, as well as frons and vertex densely micropunctured; eyes oval in lateral view, convex in dorsal view, with raised margins on inner side.

Thorax. Pronotum slightly wider than long, widest at base; PL in ♂ 0.67 mm, in ♀ 0.74 mm; PW in ♂ 0.72 mm, in ♀ 0.77 mm; AP in ♂ 0.56 mm, in ♀ 0.59 mm; lateral margins finely explanate; anterior angles slightly produced; anterior sublateral tubercles almost rounded, flat; posterior tubercles carinate, not reaching posterior margin; median groove wide, shallow with rounded margins, widest in posterior third; prebasal admedian pits vestigial; surface of pronotum densely micropunctured, with sparse short setae. Prosternum with disc and process flat, microreticulate; posterior margin with well projected median protuberance. Scutellum subtriangular, densely micropunctured. Mesosternum microreticulate, moderately deeply impressed mesally; sides of disc slightly convex in cross-section. Metasternum with disc flat; longitudinal suture narrow, shallow in almost whole length; disc of males admedially with longer pale setae. Elytra with sides parallel in about anterior 0.6, then continuously converging toward apices; EL in ♂ 1.79 mm, in ♀ 1.90 mm; lateral margins serrate; striae punctures well impressed, especially on disc. Legs: FT in ♂ 0.62 mm, in ♀ 0.68 mm; MT in ♂ 0.60 mm, in ♀ 0.65 mm; HT in ♂ 0.71 mm, in ♀ 0.71 mm; metatibiae of males widely shallowly excavate subapically, with tuft of short adpressed setae above excavation; apical spine indistinct (Fig. 140); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process flat, as well as disc of ventrite 1 microreticulate; discs of ventrites 2–5 almost glabrous; lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination slightly, not acuminate produced posteriad.

Sexual dimorphism. Males are recognized by longer pale setae on the disc of metasternum, excavate distal part of metatibiae and smaller size.

Distribution. Queensland, Australia.

Graphelmis kubani sp.nov.

(Figs 3, 14–17, 141)

Type locality: S-VIETNAM, Nam Cat Tien Nat.Park.

Material examined. Holotype ♂ (NMW): “S-VIETNAM, Nam Cat Tien Nat.Park, 1.-15.5.1994, Pacholatko & Dembicky”.

Paratypes (NMW, CKB): 3 ♀ ♀ with the same label as holotype; 3 ♂ ♂, 2 ♀ ♀: “LAOS 24.-29.iv 2001, Khammouan prov. 18°07'N, 104°29'E, Ban Khoun Ngeun, ca. 200m a.s.l., Peša leg.”.

Diagnosis. Within the *G. picta* species group, *G. kubani* sp.nov. differs as follows: 1) elytral yellow marking reduced, striped; 2) lateral margins of pronotal median groove yellow; 3) head, pronotum and disc of pro- and mesosternum microreticulate; 4) penis in lateral view curved; 5) eyes extremely large.

Description. Body form elongate (Fig. 3); CL in ♂ 1.82 mm, in ♀ ♀ (1.88 – 1.94 mm); EW in ♂ 0.79 mm, in ♀ ♀ (0.76 – 0.78 mm), CL/EW in ♂ 2.30, in ♀ ♀ (2.45 – 2.49).

Colour pattern: pronotum with yellowish anterior

margin (widened mesally) and margins along median groove; elytra with yellowish humeri, stripes on intervals 3 and 5 and indistinct yellowish macula in middle of disc.

Head. HW in ♂ 0.44 mm, in ♀♀ (0.41–0.46 mm); ID in ♂ 0.19 mm, in ♀♀ (0.18–0.21 mm); ED in ♂ 0.22 mm, in ♀♀ (0.21–0.22 mm); HW/ID in ♂ 2.31, in ♀♀ (2.21–2.33). Labrum paler; surface glabrous, with long yellow setae; clypeus as long as labrum, microreticulate, with very sparse long setae; frons and vertex microreticulate with short sparse setae; eyes very large, oval in lateral view and distinctly convex in dorsal view, with raised margins.

Thorax. Pronotum slightly wider than long, widest in about middle or basal third; PL in ♂ 0.53 mm, in ♀♀ (0.50–0.53 mm); PW in ♂ 0.57 mm, in ♀♀ (0.56–0.62 mm); AP in ♂ 0.44 mm, in ♀♀ (0.44–0.49 mm); lateral margins finely explanate; anterior margin paler; anterior angles produced; posterior angles paler; sublateral tubercles distinct, with yellow setae; anterior tubercles almost rounded; posterior tubercles carinate, reaching posterior margin; median groove large and shallow; raised lateral edges of groove narrow, glabrous, with yellow setae; prebasal admedian pits small, feebly impressed; surface densely microreticulate with sparse yellow setae. Prosternum: prosternal process with lateral margins narrow, finely raised; posterior margin with more or less well demarcated median protuberance; surface indistinctly microreticulate. Scutellum yellow, flat; surface microreticulate. Mesosternum deeply impressed postero-mesally, without oblique microreticulate carinae; surface distinctly microreticulate. Metasternum about twice as long as mesosternum, almost flat; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture fine, narrow except short anterior portion; almost whole surface of disc covered by plastron structures; very narrow area posteriorly of anterior margin and along median suture microreticulate; males with disc sparsely setose. Elytra with sides slightly widened about in anterior 0.75, then continuously converging toward almost rounded apices; EL in ♂ 1.29 mm, in ♀♀ (1.38–1.41 mm); lateral margins paler except anterior angles, distinctly explanate and serrate; striae punctures large and deeply impressed; intervals 1 and 5 slightly raised; interval 3 raised prebasally (raised portion yellow); elytral surface microreticulate; intervals with long yellow setae. Legs glabrous; FT in ♂ 0.50 mm, in ♀♀ (0.47–0.51 mm); MT in ♂ 0.47 mm, in ♀♀ (0.44–0.50 mm); metatibiae slightly widened distally; posterior ends of male metatibiae (Fig. 141); HT in ♂ 0.53 mm, in ♀♀ (0.51–0.54 mm); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process flat; mesal portion of disc of process and remaining ventrites microreticulate; lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination produced posteriad (more in males). Sternite 9 and spiculum gastrale (Fig. 16).

Aedeagus (Figs 14, 15). Penis elongate; in lateral view finely continuously curved; basally produced ventrad; in ventral view straight, with sides parallel; membranous endophallus well developed; ventral lobe without distinctly

demarcate apex; phallobasis short, about 0.27× as long as penis.

Ovipositor (Fig. 17) with terminal segment almost straight and slender; preterminal segment about 3.2× as long as terminal, outer side concave; distal sclerite subquadrate, about half as long as preterminal; basal segment 1.2× as long as preterminal and distal sclerites combined; ventral fulcrum straight.

Sexual dimorphism. Males are distinguished by metatibial incision, yellow setae on disc of metasternum and by more produced sides of apical emargination of ventrite 5.

Distribution. So far known only from South Vietnam and Laos.

Etymology. Named for colleague and friend Vít Kubáň from Brno (Czech Republic).

Graphelmis palawanensis sp.nov.

(Figs 4, 18–21, 142)

Type locality: PHILIPPINES, 150m Palawan, PORT BARTON.

Material examined. Holotype ♂ (NMW): “PHILIPPINES, 150m Palawan, PORT BARTON 14.-18. Dec. 1990 Bolm lgt.”.

Paratypes (NMW, CKB): 3 ♀♀ with the same label as holotype.

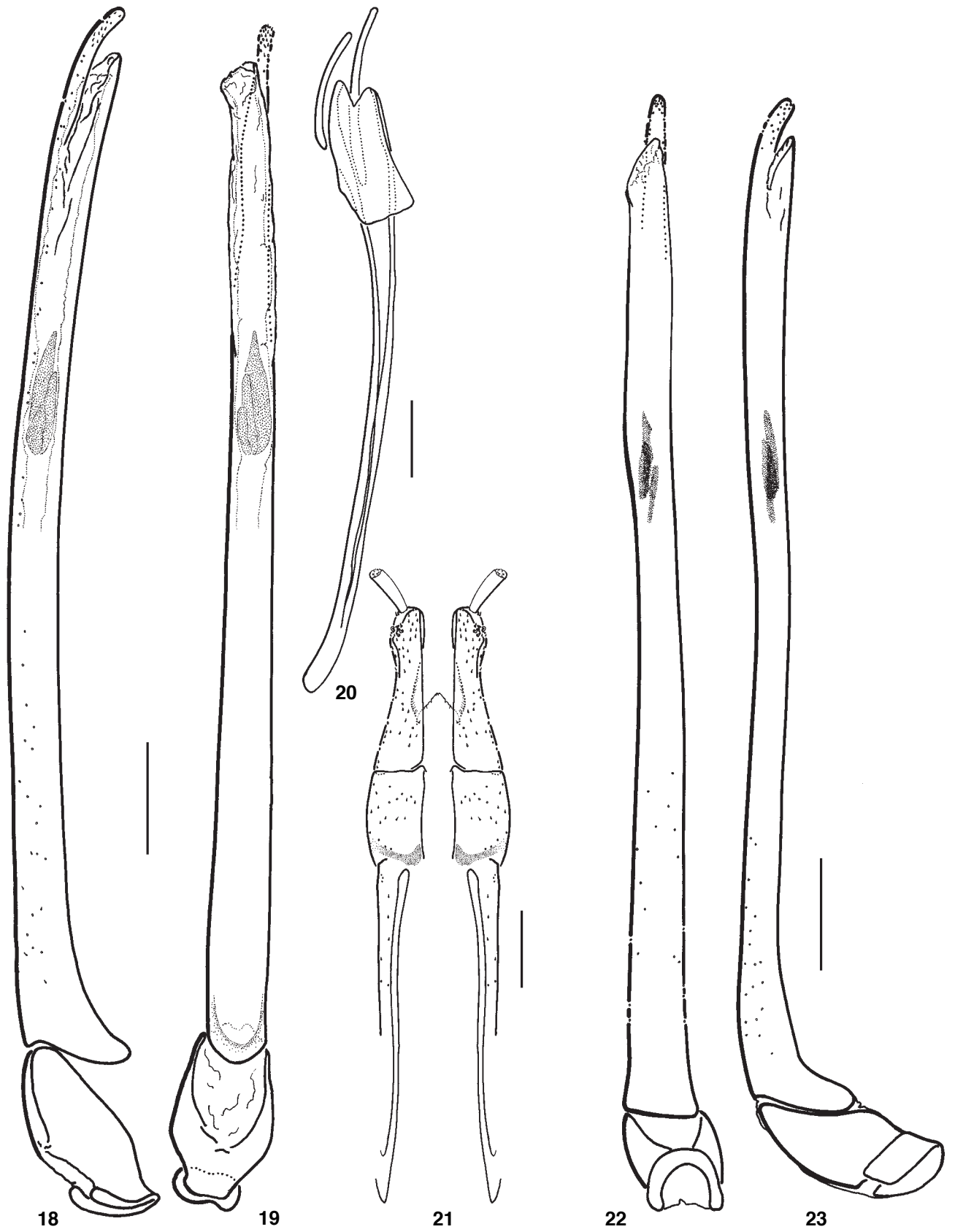
Diagnosis. Within the *G. picta* species group, *G. palawanensis* sp.nov. differs as follows: 1) head and pronotum microreticulate; 2) median pronotal groove with yellowish margin; 3) subapical excavation of male metatibiae shallow and elongate; 4) penis long and distinctly narrow, finely curved in lateral view.

Description. Body form elongate (Fig. 4); CL in ♂ 1.90 mm, in ♀♀ 2.10–2.22 mm; EW in ♂ 0.79 mm, in ♀♀ 0.83–0.86 mm, CL/EW in ♂ 2.39, in ♀♀ 2.54–2.58.

Colour pattern: pronotum with yellowish anterior margin (mesally widened) and narrow margins along median groove; sublateral tubercles usually dark; elytra with pair of prebasal and subapical oblique maculae and pair of small admedian spots about in middle.

Head. HW in ♂ 0.47 mm, in ♀♀ 0.50 mm; ID in ♂ 0.24 mm, in ♀♀ 0.25–0.29 mm; ED in ♂ 0.24 mm, in ♀♀ 0.24–0.26 mm; HW/ID in ♂ 2.00, in ♀♀ 1.70–2.00. Labrum with setigerous punctures in anterior half, posterior half glabrous, anterior margin paler; clypeus as long as labrum, microreticulate; fronto-clypeal suture depressed; frons slightly depressed between antennae, as well as vertex microreticulate; eyes large, oval in lateral view and convex in dorsal view, with raised margins on inner side.

Thorax. Pronotum slightly wider than long, widest anteriorly of base; PL in ♂ 0.56 mm, in ♀♀ 0.62–0.68 mm; PW in ♂ 0.62 mm, in ♀♀ 0.66–0.69 mm; AP in ♂ 0.48 mm, in ♀♀ 0.52–0.53 mm; lateral margins finely explanate; anterior angles produced; anterior sublateral tubercles rounded; posterior tubercles almost half as long as PL, carinate, reaching posterior pronotal margin;



Figs 18–23. 18–21 *Graphelmis palawanensis* sp.nov.: 18) aedeagus lateral view; 19) aedeagus ventral view; 20) spiculum gastrale and sternite 9; 21) ovipositor; 22–23 *Graphelmis bruneica* sp.nov.: 22) aedeagus lateral view; 23) aedeagus ventral view. Scale bars: 0.1mm.

median groove large and deep; lateral margins of groove raised; prebasal admedian pits vestigial; surface microreticulate, with sparse tiny setae. Prosternum microreticulate; prosternal process with lateral margins slightly raised, microreticulate; posterior margin with indistinct median protuberance. Scutellum almost rounded, flat; surface glabrous. Mesosternum impressed mesally, without oblique carinae; surface microreticulate. Metasternum about twice as long as mesosternum; disc slightly convex in cross-section; longitudinal suture feebly impressed in posterior two thirds; admedian prebasal punctures narrow, transverse; sublateral carinae absent; surface widely covered by plastron structures except longitudinal suture. Elytra parallel-sided in anterior 0.7, then converging toward almost acuminate apices; EL in ♂ 1.33 mm, in ♀♀ 1.49 – 1.59 mm; lateral margins explanate and serrate; striae punctures large, more deeply impressed laterally; interval 3 raised anteriorly, entire interval 5 slightly raised; intervals and interstices rough with sparse short setae. Legs yellow; femora almost glabrous; tibiae finely micropunctured and grooved; FT in ♂ 0.53 mm, in ♀♀ 0.56 – 0.59 mm; MT in ♂ 0.50 mm, in ♀♀ 0.53 – 0.56 mm; metatibiae of males (Fig. 142), HT in ♂ 0.56 mm, in ♀♀ 0.59 – 0.65 mm; length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process flat with apex rounded; narrow mesal portion of process and disc of ventrites microreticulate; lateral portions of process and ventrites covered by plastron structures; ventrite 5 with sides of apical emargination finely produced posteriad. Sternite 9 and spiculum gastrale (Fig. 20).

Aedeagus (Figs 18, 19). Penis long and extremely slender, in lateral view indistinctly curved, base slightly produced ventrad; penis in ventral view parallel-sided with apex narrow; membranous endophallus with three sclerites of different size; phallobasis short, about 0.2× as long as penis.

Ovipositor (Fig. 21) with terminal segment slender, almost straight; preterminal segment about 3.3× as long as terminal, outer side concave; distal sclerite elongate, almost 0.6× as long as preterminal; basal segment about 1.3× as long as preterminal and distal sclerites combined; ventral fulcrum finely sinuate.

Sexual dimorphism. Males are distinguished by excavated metatibial apices with apical spines.

Distribution. So far known only from Palawan Island (Philippines).

Etymology. Named in reference to the geographical distribution.

***Graphelmis bruneica* sp.nov.**

(Figs 5, 22, 23, 143)

Type locality: BRUNEI: Temburong Kuala Belalong S – 195.

Material examined. Holotype ♂ (NMW): “BRUNEI: Temburong Kuala Belalong S – 195, VII/95 leg. Brocherding”.

Diagnosis. Within the *G. picta* species group, *G. bruneica* sp.nov. differs as follows: 1) anterior sublateral pronotal tubercles indicated only; 2) lateral margins of pronotal median longitudinal groove narrow, shiny; 3) legs yellow; 4) penis very slender, base in lateral view extremely produced ventrad; 5) sides of metasternal disc finely grooved; 6) mesosternum with oblique carinae.

Description. Body form elongate (Fig. 5); CL in ♂ 2.09 mm; EW in ♂ 0.79 mm; CL/EW in ♂ 2.63.

Colour pattern: pronotum with slightly paler anterior margin; elytra with large prebasal spots and pair of oblique subapical spots.

Head. HW in ♂ 0.44 mm; ID in ♂ 0.21 mm; ED in ♂ 0.24 mm; HW/ID in ♂ 2.14. Labrum paler; anterior two thirds with dense long pale setae; posterior third glabrous; clypeus about as long as labrum, rough and setose; frontoclypeal suture narrow; surface of frons and vertex rough, sparsely setose; eyes large, oval in lateral view and convex in dorsal view, with raised margin.

Thorax. Pronotum wider than long, widest in about basal third; PL in ♂ 0.56 mm; PW in ♂ 0.62 mm; AP in ♂ 0.46 mm; lateral margins explanate; anterior angles produced; anterior sublateral tubercles fine; posterior tubercles absent; median groove narrow, without raised lateral margins; prebasal admedian pits absent; surface densely irregularly micropunctured, with sparse tiny setae. Prosternum: prosternal process parallel-sided; lateral margins slightly raised, microreticulate; posterior margin with wide median protuberance; surface plicate-microreticulate. Scutellum almost rounded, flat; surface shiny with a few small punctures. Mesosternum impressed mesally, with oblique transverse carinae; surface microreticulate; posterior half with fine plications. Metasternum about twice as long as mesosternum, almost flat; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture depressed in posterior 0.75; sides of disc finely irregularly grooved; almost entire surface covered by plastron structures; anterior margin and mesal portion along suture finely rough; disc of males admedially with a few long yellow setae. Elytra with sides parallel in anterior about 0.6, then continuously converging toward nearly rounded apices; EL in ♂ 1.53 mm; lateral margins explanate and serrate; striae punctures feebly impressed; intervals almost flat; elytral surface finely plicate-micropunctured; intervals with sparse tiny short setae. Legs: femora microreticulate; tibiae finely microreticulate; FT in ♂ 0.57 mm; MT in ♂ 0.56 mm; metatibiae of males slightly widened apicad and incised preapically; apical spine acuminate (Fig. 143); HT in ♂ 0.59 mm; length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process finely depressed mesally; narrow mesal portion of process and ventrites microreticulate; admedian and lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination slightly produced posteriad.

Aedeagus (Figs 22, 23). Penis slender; in lateral view slightly curved and incised prebasally with base only finely

widened; in ventral view almost straight, slightly widened toward base; membranous endophallus with three weak sclerites; phallobasis short, about 0.28x as long as penis.

Female unknown.

Distribution. So far known only from the type locality.

Etymology. Named in reference to the geographical distribution.

***Graphelmis jendeki* sp.nov.**

(Figs 6, 24–27, 144)

Type locality: THAILAND, Mae Ping.

Material examined. Holotype ♂ (NMW): “THAILAND, Mae Ping, 16.-20.6.1991, leg. Malicky”. **Paratypes** (NMW, CKB): 1♂, 3♀♀ with the same label as holotype; 1♂, 2♀♀: “LAOS 24.-29.iv 2001, Khammouan prov. 18°07’N, 104°29’E, Ban Khoun Ngeun, ca. 200m a.s.l., Peša leg.”; 1♀: “LAOS centr. Khammouan prov. 10.-13.VI. 2001 BAN KHOUN NGEUN env. 18°07’N, 104°29’E, alt 250m E. Jendek & O. Šauša leg.”.

Diagnosis. Within the *G. picta* species group, *G. jendeki* sp.nov. differs as follows: 1) elytral yellow marking reduced to 4 or 5 small spots; 2) head and disc of pronotum and mesosternum microreticulate; 3) penis in lateral view curved with sides unevenly sinuate.

Description. Body form elongate (Fig. 6); CL in ♂♂ (1.97, 2.15 mm), in ♀♀ (2.21 – 2.22 mm); EW in ♂♂ (0.88, 0.94 mm), in ♀♀ (0.94 – 0.97 mm), CL/EW in ♂♂ (2.23, 2.28), in ♀♀ (2.27 – 2.34).

Colour pattern: pronotum with yellowish anterior margin (widened mesally); elytra with prebasal and subapical pair of slightly elongated yellowish spots.

Head. HW in ♂♂ (0.44, 0.47 mm), in ♀♀ (0.47 – 0.50 mm); ID in ♂♂ 0.18 mm, in ♀♀ (0.19 – 0.21 mm); ED in ♂♂ 0.21 mm, in ♀♀ (0.21 – 0.24 mm); HW/ID in ♂♂ (2.50, 2.67), in ♀♀ (2.36 – 2.46). Labrum paler; surface glabrous, with long yellow setae; clypeus as long as labrum, sparsely setose, glabrous except of postero-lateral microreticulate portions; frons and vertex microreticulate with short sparse setae; eyes very large, oval in lateral view and distinctly convex in dorsal view, with raised margin.

Thorax. Pronotum slightly wider than long, widest in basal third; PL in ♂♂ (0.56, 0.62 mm), in ♀♀ (0.62 – 0.66 mm); PW in ♂♂ (0.65, 0.71 mm), in ♀♀ (0.71 – 0.74 mm); AP in ♂♂ (0.49, 0.51 mm), in ♀♀ 0.56 mm; lateral margins finely explanate; anterior margin paler; anterior angles produced; sublateral tubercles distinct with long setae; anterior tubercles almost rounded; posterior tubercles carinate; median groove large, almost reaching pronotal margins; lateral margins of groove raised, glabrous; prebasal admedian pits small but distinct; surface densely microreticulate with long sparse yellow setae. Prosternum: prosternal process parallel-sided; lateral margins almost flat; posterior margin with well developed median protuberance; surface of prosternum microreticulate. Scutellum flat, microreticulate. Mesosternum deeply impressed mesally, without oblique microreticulate carinae; surface microreticulate. Metasternum about twice

as long as mesosternum; almost flat; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture finely depressed except of short anterior part; almost whole surface of disc covered by plastron structures; narrow area posteriorly of anterior margin and along median suture microreticulate; males admedially with short sparse yellow setae. Elytra with sides slightly widened about in anterior 0.75, then continuously converging toward almost rounded apices; EL in ♂♂ (1.41, 1.53 mm), in ♀♀ (1.56 – 1.59 mm); lateral margins paler except anterior angles, distinctly explanate and serrate; striae punctures large and deeply impressed; intervals 1 and 5 carinate along entire length, interval 3 raised anteriorly; elytral surface microreticulate with long yellow setae. Legs glabrous; FT in ♂♂ 0.60 mm, in ♀♀ (0.60 – 0.62 mm); MT in ♂♂ 0.59 mm, in ♀♀ (0.59 – 0.60 mm); metatibiae widened distally; ends of male metatibiae incised; apical spine small and acuminate (Fig. 144); HT in ♂♂ (0.63, 0.65 mm), in ♀♀ (0.65 – 0.68 mm); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process flat; disc of process and mesal portion of remaining ventrites microreticulate; lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination distinctly produced posteriorly, especially in males. Sternite 9 and spiculum gastrale (Fig. 26).

Aedeagus (Figs 24, 25). Penis elongate, slender; in lateral view curved in about anterior third; in ventral view curved, with sides unevenly sinuate; apex narrow; membranous endophallus with two sclerotized structures; ventral lobe feebly sclerotized with apex almost truncated; phallobasis short, about 0.2x as long as penis.

Ovipositor (Fig. 27) with terminal segment straight and slender; preterminal segment about 3.3x as long as terminal, outer side concave; distal sclerite subquadrate, about 0.6x as long as preterminal; basal segment about 1.2x as long as preterminal and distal sclerites combined; ventral fulcrum straight.

Sexual dimorphism. Males are distinguished by metatibial incision, yellow setae on disc of metasternum and by more produced sides of apical emargination of ventrite 5.

Distribution. Thailand, Laos.

Etymology. Named for Eduard Jendek, friend and colleague coleopterist.

***Graphelmis gibberosa* sp.nov.**

(Figs 7, 28–30, 145)

Type locality: Indonesia/Kalimantan W Nanga Sarawai env. Tontang.

Material examined. Holotype ♂ (NMW): “Indonesia/Kalimantan W Nanga Sarawai env. Tontang 24.7-2.8. J. Schneider lgt. 1993”.

Diagnosis. Within the *G. picta* species group, *G. gibberosa* sp.nov. differs as follows: 1) admedian prebasal pits on pronotum distinct; 2) raised lateral margins of

pronotal median groove almost glabrous and shiny; 3) elytra divergent in anterior two-thirds; 4) elytral apices distinctly produced; 5) dorsal side of penis with distinct protuberance in lateral view.

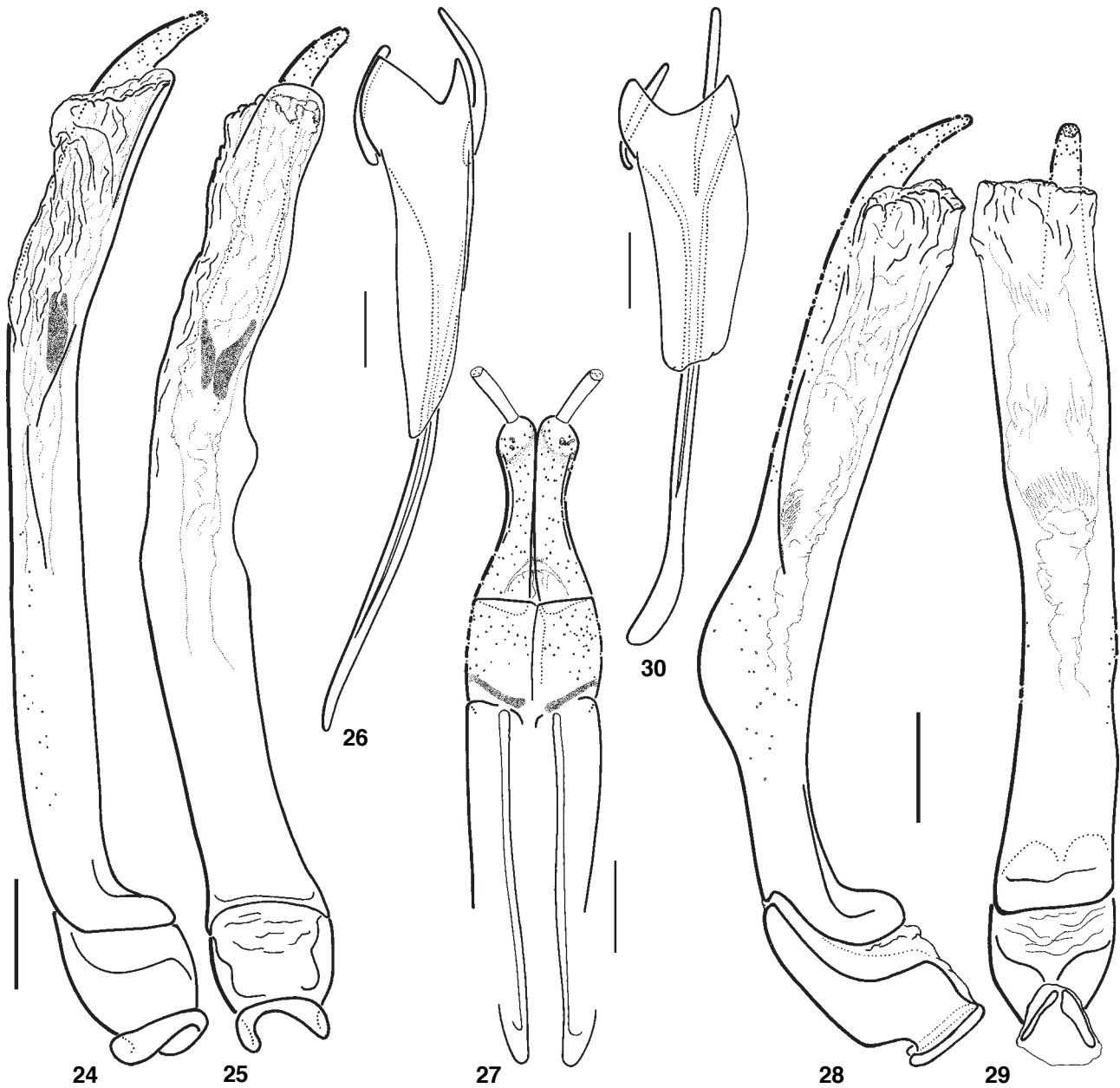
Description. Habitus (Fig. 7); CL in ♂ 1.93 mm; EW in ♂ 0.82 mm; CL/EW in ♂ 2.34.

Colour pattern: pronotum with yellowish anterior margin (distinctly widened mesally); elytra with yellowish subtriangular prebasal spots and pair of curved subapical spots.

Head. HW in ♂ 0.44 mm; ID in ♂ 0.19 mm; ED in ♂ 0.21 mm; HW/ID in ♂ 2.31. Labrum paler with dense long pale setae. Clypeus about as long as labrum, with thin pale

setae; sides finely microreticulate; mesal portion glabrous; fronto-clypeal suture narrow; frons and vertex microreticulate and sparsely setose; eyes large, oval in lateral view and convex in dorsal view, with raised margin.

Thorax. Pronotum almost as long as wide, widest in about basal third; PL in ♂ 0.54 mm; PW in ♂ 0.56 mm; AP in ♂ 0.41 mm; lateral margins explanate; anterior angles produced, somewhat pointed; anterior sublateral tubercles slightly raised; posterior tubercles carinate; median groove large; raised lateral margins almost carinate; prebasal admedian pits distinct; surface densely microreticulate; margins of groove and tubercles shiny and sparsely setose. Prosternum: prosternal process with sides slightly concave; lateral margins narrowly raised; poste-



Figs 24–30. 24–27 *Graphelmis jendeki* sp.nov.: 24) aedeagus lateral view; 25) aedeagus ventral view; 26) spiculum gastrale and sternite 9; 27) ovipositor; 28–30 *Graphelmis gibberosa* sp.nov.: 28) aedeagus lateral view; 29) aedeagus ventral view; 30) spiculum gastrale and sternite 9. Scale bars: 0.1mm.

rior margin with narrow median protuberance; surface finely microreticulate. Scutellum subtriangular, flat; surface except of glabrous anterior margin microreticulate. Mesosternum impressed mesally, sides convex in cross-section; surface microreticulate. Metasternum about twice as long as mesosternum, almost flat; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture depressed in posterior 0.75; almost entire surface covered by plastron structures; anterior margin and mesal portion along suture finely microreticulate; disc of males admedially with a few long yellow setae. Elytra with sides diverging in anterior two-thirds, then continuously converging toward distinctly produced apices; EL in ♂ 1.38 mm; lateral margins explanate and finely serrate; striae punctures small but well impressed; intervals almost flat; elytral surface almost glabrous or very feebly plicate; intervals with a few long setae. Legs indistinctly microreticulate; FT in ♂ 0.56 mm; MT in ♂ 0.56 mm; metatibiae of males (Fig. 145); HT in ♂ 0.62 mm; length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process finely depressed mesally; narrow mesal portion of process and ventrites 1, 2 microreticulate; mesal portion of remaining ventrites glabrous; admedian and lateral portions of ventrites covered by plastron structures; apex of ventrite 5 in males deeply emarginate; sides of emargination distinctly produced posteriorly. Sternite 9 and spiculum gastrale (Fig. 30).

Aedeagus (Figs 28, 29). Penis elongate; in lateral view finely curved; apex arched; dorsal side with large protuberance; prebasal portion narrower; base distinctly produced ventrad. Penis in ventral view almost straight; sides unevenly sinuate; membranous endophallus with a few slightly more sclerotized areas; phallobasis short, ca. 0.28x as long as penis.

Female unknown.

Distribution. So far known only from Kalimantan (Indonesia).

Etymology: from Latin *gibber* – gibbosity, in reference to the form of penis.

Graphelmis philemoni sp.nov.

(Figs 8, 31–34, 146)

Type locality: SARAWAK (Borneo), ca 40km SE KAPIT, Rumah Ugap, Sut river.

Material examined. Holotype ♂ (NMW): “SARAWAK (Borneo), ca 40km SE KAPIT 03.1994, J. Kodada leg.”. **Paratypes** (NMW, CKB, CBB): 24♂♂, 44♀♀ with the same label as holotype; 9♂♂, 16♀♀: “Sarawak, Kapit Dist. Rumah Ugap vill., Sut. riv., 3.-9.3.1994 Sv. Bílý leg.”; 27♂♂, 26♀♀: “INDONESIA-Sarawak Kapit Dist., Rumah Ugap, Sut river, 3.-8.3.1994 J. Horák leg.”; 11♂♂, 8♀♀: “Sarawak Kapit Dist., Rumah Ugap vill., Sut riv., 3.-9.3.1994 J. Horák leg.”; 2♂♂, 2♀♀: “Indonesia/Kalimantan W. Tanga Sarawai env. Tontang 24.7-2.8. J. Schneider lgt. 1993”; 10♂♂, 13♀♀: “SARAWAK (Borneo), ca 25km E KAPIT, III.1994, Kodada leg.”; 1♂, 3♀♀: “MALAYSIA: Sarawak 25km E KAPIT, III.1994, leg. Kodada”; 1♀: “MALAYSIA: Sarawak ca. 80km S Kuching Padawan, III.1994, leg. Kodada”; 5♂♂: “Sarawak, Kapit dist. Rumah Ugap

viii., Sut riv., 3.-9.3. 1994 J. Horák leg.”; 7♂♂, 7♀♀: “Indonesia/Kalimantan W Nanga Sarawai env. Tontang 24.7-2.8. J. Schneider lgt. 1993”; 1♂, 2♀♀: “Indonesia/Kalimantan W Nanga Ela env. 4.-10.8. Nanaga Nyuruh 700m J. Schneider lgt. 1993”; 1♂, 3♀♀: “Malaysia, Sabah, Batu Punggul Resort env., 24.VI.-1.VII. 1996, 11a, river about 10m wide, flowing in primary forest, partly shaded”; 1♀: “Malaysia, Sabah, Gn. Antulai, ca 5km S Sapulut, 2.VII. 1996, 13a, river about 7m wide flowing through secondary forest”.

Diagnosis. Within the *G. picta* species group *G. philemoni* sp.nov. differs as follows: 1) yellow elytral marking with distinct subquadrate median macula; 2) femora basally black; 3) male metasternum with admedian prebasal setal tufts; 4) male metatibiae very feebly incised, apical spine inconspicuous; 5) sides of penis unevenly sinuate; 6) base of penis in lateral view only slightly widened; 7) head and disc of pro- and mesosternum microreticulate.

Description. Body form elongate (Fig. 8); CL in ♂♂ (2.07 – 2.25 mm, \bar{S} = 2.17 ± 0.06), in ♀♀ (2.03 – 2.46 mm, \bar{S} = 2.21 ± 0.16); EW in ♂♂ (0.85 – 0.91 mm, \bar{S} = 0.88 ± 0.02), in ♀♀ (0.79 – 1.00 mm, \bar{S} = 0.88 ± 0.07); CL/EW in ♂♂ (2.43 – 2.52, \bar{S} = 2.47 ± 0.03), in ♀♀ (2.43 – 2.57, \bar{S} = 2.50 ± 0.05).

Colour pattern: pronotum with yellowish anterior margin (widened mesally) and lateral margins of median groove; elytra with yellowish irregular prebasal spots, more or less distinct subquadrate mesal spot in middle and narrow oblique subapical spots (sometimes reduced to two small spots) on each elytron.

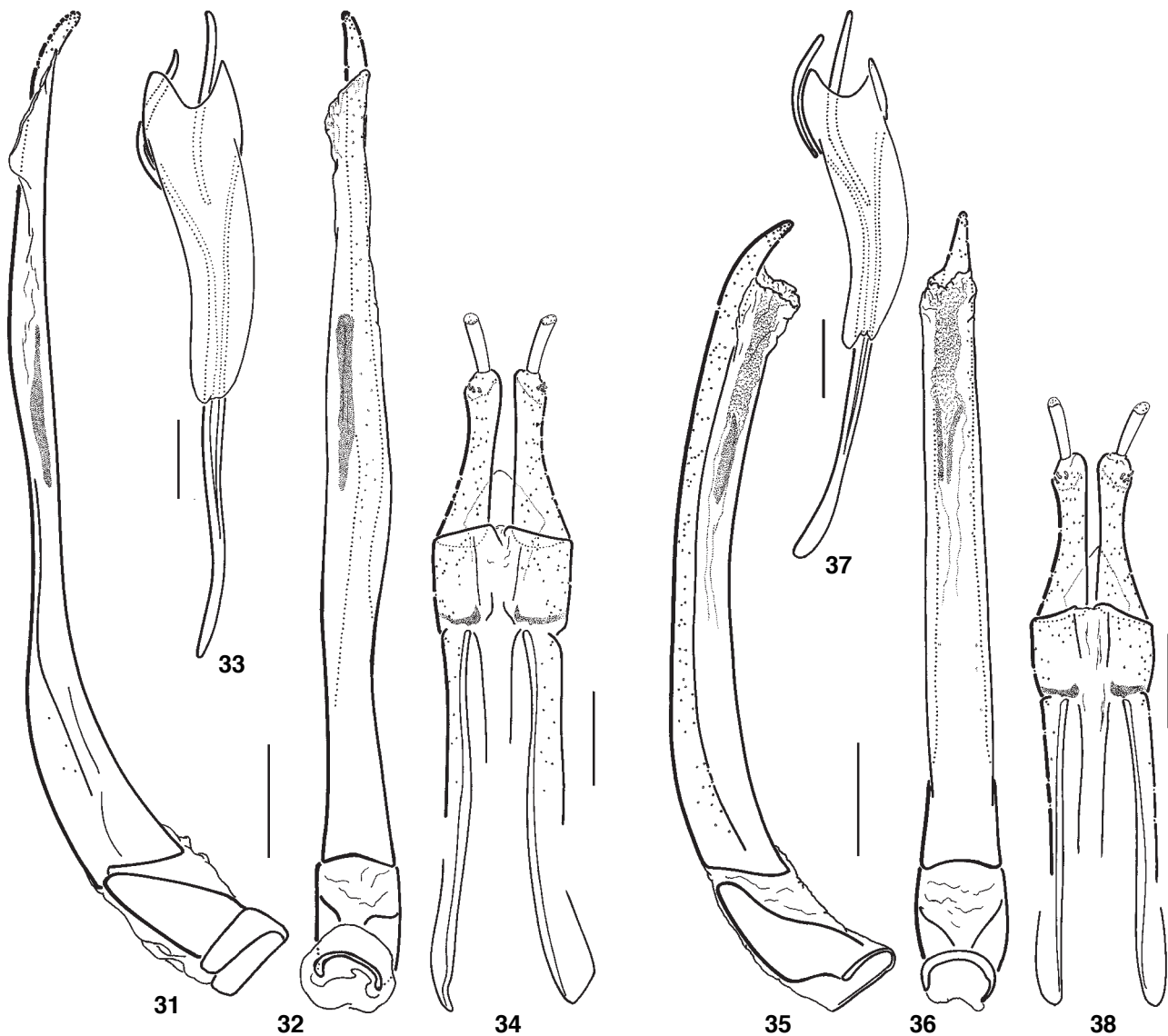
Head. HW in ♂♂ (0.43 – 0.49 mm, \bar{S} = 0.45 ± 0.02), in ♀♀ (0.44 – 0.51 mm, \bar{S} = 0.46 ± 0.03); ID in ♂♂ (0.19 – 0.22 mm, \bar{S} = 0.21 ± 0.01), in ♀♀ (0.21 – 0.24 mm, \bar{S} = 0.22 ± 0.01); ED in ♂♂ (0.21 – 0.24 mm, \bar{S} = 0.22 ± 0.01), in ♀♀ (0.21 – 0.26 mm, \bar{S} = 0.23 ± 0.02); HW/ID in ♂♂ (2.13 – 2.31, \bar{S} = 2.23 ± 0.08), in ♀♀ (2.00 – 2.19, \bar{S} = 2.09 ± 0.07). Labrum finely microreticulate to glabrous; anterior margin paler; anterior half with long pale setae. Clypeus about as long as labrum; surface microreticulate and sparsely setose; fronto-clypeal suture narrow; frons and vertex microreticulate and sparsely setose; eyes large, almost rounded in lateral view and convex in dorsal view, with raised margin.

Thorax. Pronotum almost as long as wide, widest in basal half; PL in ♂♂ (0.57 – 0.63 mm, \bar{S} = 0.59 ± 0.02), in ♀♀ (0.59 – 0.71 mm, \bar{S} = 0.63 ± 0.04); PW in ♂♂ (0.65 – 0.71 mm, \bar{S} = 0.68 ± 0.03), in ♀♀ (0.63 – 0.76 mm, \bar{S} = 0.69 ± 0.05); AP in ♂♂ (0.49 – 0.51 mm, \bar{S} = 0.50 ± 0.01), in ♀♀ (0.49 – 0.57 mm, \bar{S} = 0.52 ± 0.03); lateral margins explanate; anterior angles produced; anterior sublateral tubercles fine, almost glabrous; posterior tubercles carinate, almost reaching posterior pronotal margin; median groove large; lateral margins of groove raised, glabrous; prebasal admedian pits distinct; surface microreticulate, with sparse tiny setae especially on tubercles and margins of groove; posterior margin glabrous. Prosternum almost flat; prosternal process with sides parallel; lateral margins flat; posterior margin with well projected, moderately wide

median protuberance; surface microreticulate. Scutellum subtriangular or almost rounded, flat; surface finely more or less densely micropunctured; interstices shiny. Mesosternum impressed mesally; sides of disc convex in cross-section; surface microreticulate. Metasternum about twice as long as mesosternum, almost flat; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture feebly depressed in about posterior half; almost entire surface covered by plastron structures; anterior margin and mesal portion along suture finely micropunctured or rough; disc of males with admedian prebasal tufts of long setae. Elytra with sides subparallel in anterior two-thirds, then continuously converging toward nearly rounded apices; EL in ♂♂ (1.50 – 1.62 mm, \bar{S} = 1.57 ± 0.04), in ♀♀ (1.44 – 1.75 mm, \bar{S} = 1.58 ± 0.12); lateral margins paler, explanate and serrate; striae punctures well impressed; interval 3 raised in anterior about 0.25; entire interval 5 carinate; interval 7 almost flat; elytral

surface finely plicate; intervals with longer yellow setae. Legs microreticulate; FT in ♂♂ (0.54 – 0.59 mm, \bar{S} = 0.57 ± 0.02), in ♀♀ (0.53 – 0.65 mm, \bar{S} = 0.58 ± 0.04); MT in ♂♂ (0.53 – 0.57 mm, \bar{S} = 0.55 ± 0.02), in ♀♀ (0.50 – 0.65 mm, \bar{S} = 0.56 ± 0.05); metatibiae of males slightly widened apicad and apically feebly incised; apical spine acuminate and very small (Fig. 146); HT in ♂♂ (0.60 – 0.65 mm, \bar{S} = 0.63 ± 0.02), in ♀♀ (0.56 – 0.71 mm, \bar{S} = 0.63 ± 0.05); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process almost flat; mesal portion of process microreticulate; mesal portion of ventrites glabrous; admedian and lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination produced posteriad (more in males); produced sides slightly more separated in females. Sternite 9 and spiculum gastrale (Fig. 33).



Figs 31–38. 31–34 *Graphelmis philemoni* sp.nov.: 31) aedeagus lateral view; 32) aedeagus ventral view; 33) spiculum gastrale and sternite 9; 34) ovipositor; 35–38 *Graphelmis darwini* sp.nov.: 35) aedeagus lateral view; 36) aedeagus ventral view; 37) spiculum gastrale and sternite 9; 38) ovipositor. Scale bars: 0.1mm.

Aedeagus (Figs 31, 32). Penis slender; in lateral view almost straight in anterior 0.75 then finely curved; dorsal side bisinuate. Penis in ventral view with sides unevenly sinuate, slightly widened toward base; phallobasis short, almost 0.21× as long as penis.

Ovipositor (Fig. 34) with terminal segment slender and almost straight; preterminal segment about 3.5× as long as terminal, outer side concave; distal sclerite subquadrate, almost 0.6× as long as preterminal; basal segment about 1.4× as long as preterminal and distal sclerites combined; ventral fulcrum finely sinuate.

Sexual dimorphism. Males are distinguished by incised metatibial apices with small spines and prebasal setal tufts on disc of metasternum. Produced sides of apical emargination of ventrite 5 are more separated in females.

Distribution. So far known from Sabah, Sarawak (Malaysia) and Kalimantan (Indonesia).

Etymology. Named for friend from the small village Sapulut in Sabah (Malaysia), Philemon Lantir.

Graphelmis darwini sp.nov.

(Figs 9, 35–193, 147)

Type locality: Indonesia/Kalimantan W Nanga Sarawai env. Tontang.

Material examined. Holotype ♂ (NMW): “Indonesia/Kalimantan W Nanga Sarawai env. Tontang, 24.7-2.8., J. Schneider lgt., 1993”. **Paratypes** (NMW, CKB): 4♂♂, 8♀♀ with the same label as holotype; 1♂, 1♀: “Indonesia/Kalimantan W Nanga Ela env. 4.-10.8.Nanga Nyuruh 700m, J. Schneider lgt. 1993”; 2♂♂, 3♀♀: “Sarawak Kapit Dist., Rumah Ugap vill., Sut riv., 3.-9.3.1994 J. Horák leg.”.

Diagnosis. Within the *G. picta* species group, *G. darwini* sp.nov. is similar to *G. philemoni* sp.nov., from which differs as follows: 1) subquadrate median macula on elytra less distinct; 2) narrower body shape; 3) male metasternum with sparse admedian setae; 4) male metatibiae deeper incised, apical spine more projected; 6) penis smaller, parallel-sided.

Description. Body form elongate (Fig. 9); CL in ♂♂ (1.96 – 2.21 mm, \bar{S} = 2.05 ± 0.10), in ♀♀ (2.06 – 2.21 mm, \bar{S} = 2.12 ± 0.06); EW in ♂♂ (0.78 – 0.91 mm, \bar{S} = 0.83 ± 0.05), in ♀♀ (0.82 – 0.85 mm, \bar{S} = 0.84 ± 0.01); CL/EW in ♂♂ (2.37 – 2.59, \bar{S} = 2.47 ± 0.08), in ♀♀ (2.49 – 2.59, \bar{S} = 2.54 ± 0.04).

Colour pattern: pronotum with yellowish anterior margin and feebly yellowish lateral margins of median groove; elytra with yellowish humeri, raised portions of interval 3, more or less distinct median subquadrate macula and two pairs of small subapical spots.

Head. HW in ♂♂ (0.41 – 0.47 mm, \bar{S} = 0.43 ± 0.02), in ♀♀ (0.43 – 0.47 mm, \bar{S} = 0.45 ± 0.02); ID in ♂♂ (0.18 – 0.21 mm, \bar{S} = 0.19 ± 0.01), in ♀♀ (0.19 – 0.22 mm, \bar{S} = 0.20 ± 0.01); ED in ♂♂ (0.21 – 0.24 mm, \bar{S} = 0.22 ± 0.01), in ♀♀ (0.21 – 0.24 mm, \bar{S} = 0.22 ± 0.01); HW/ID in ♂♂ (2.23 – 2.33, \bar{S} = 2.30 ± 0.04), in ♀♀ (2.13 – 2.31, \bar{S} = 2.20 ± 0.07). Labrum finely microreticulate to glabrous; anterior margin paler; anterior half with long pale setae;

clypeus about as long as labrum, microreticulate and sparsely setose; fronto-clypeal suture narrow; frons and vertex microreticulate and sparsely setose; eyes large, almost rounded in lateral view and convex in dorsal view, with raised margin.

Thorax. Pronotum almost as long as wide, widest posteriorly of middle; PL in ♂♂ (0.54 – 0.65 mm, \bar{S} = 0.58 ± 0.05), in ♀♀ (0.56 – 0.65 mm, \bar{S} = 0.61 ± 0.03); PW in ♂♂ (0.57 – 0.71 mm, \bar{S} = 0.63 ± 0.05), in ♀♀ (0.63 – 0.69 mm, \bar{S} = 0.65 ± 0.02); AP in ♂♂ (0.44 – 0.51 mm, \bar{S} = 0.47 ± 0.03), in ♀♀ (0.46 – 0.51 mm, \bar{S} = 0.49 ± 0.02); lateral margins explanate; anterior angles produced; anterior sublateral tubercles fine, almost glabrous; posterior tubercles carinate, nearly reaching posterior pronotal margin; median groove large; lateral margins of groove almost glabrous, carinate; prebasal admedian pits small; surface microreticulate, with sparse tiny setae especially on tubercles and margins of groove. Prosternum almost flat; prosternal process with sides parallel; lateral margins flat; posterior margin with well projected, moderately wide median protuberance; surface microreticulate. Scutellum subtriangular or almost rounded, flat; surface finely, more or less densely micropunctured; interstices shiny. Mesosternum impressed mesally; sides of disc convex in cross-section; surface microreticulate. Metasternum about twice as long as mesosternum, almost flat; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture feebly depressed in about posterior half to two-thirds; almost entire surface covered by plastron structures; anterior margin and mesal portion along suture finely microreticulate; disc of males with sparse admedian setae. Elytra with sides subparallel in anterior two-thirds, then continuously converging toward nearly rounded apices; EL in ♂♂ (1.41 – 1.56 mm, \bar{S} = 1.47 ± 0.06), in ♀♀ (1.47 – 1.56 mm, \bar{S} = 1.51 ± 0.03); lateral margins paler, explanate and serrate; stria punctures well impressed; interval 3 raised in anterior about 0.2; entire interval 5 carinate; elytral surface rough; intervals with short yellow setae. Legs microreticulate; FT in ♂♂ (0.50 – 0.56 mm, \bar{S} = 0.52 ± 0.03), in ♀♀ (0.51 – 0.56 mm, \bar{S} = 0.54 ± 0.02); MT in ♂♂ (0.49 – 0.54 mm, \bar{S} = 0.51 ± 0.02), in ♀♀ (0.50 – 0.54 mm, \bar{S} = 0.52 ± 0.02); metatibiae of males slightly widened apicad; subapical incision narrow and deeper as in *G. philemoni* sp.nov.; apical spine acuminate (Fig. 147); HT in ♂♂ (0.53 – 0.62 mm, \bar{S} = 0.57 ± 0.04), in ♀♀ (0.56 – 0.59 mm, \bar{S} = 0.58 ± 0.01); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process almost flat; mesal portion of process microreticulate; mesal portion of ventrites glabrous; admedian and lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination produced posteriad (more in males). Sternite 9 and spiculum gastrale (Fig. 37).

Aedeagus (Figs 35, 36). Penis slender; in lateral view slightly curved with base not produced ventrad; in ventral view straight, sides slightly widened toward base; membranous endophallus with feebly sclerotized sclerites; phallobasis short, almost 0.35× as long as penis.

Ovipositor (Fig. 38) with terminal segment slender and almost straight; preterminal segment almost 3.4× as long as terminal, outer side concave; distal sclerite subquadrate, about 0.57× as long as preterminal; basal almost 1.3× as long as preterminal and distal sclerites combined; ventral fulcrum finely almost straight.

Sexual dimorphism. Males are distinguished by incised metatibial apices and longer setae on disc of metasternum.

Distribution. So far known only from Kalimantan (Indonesia).

Etymology. Named in honour of Charles Darwin.

***Graphelmis basalis* sp.nov.**

(Figs 39, 48–51, 148)

Type locality: PAPUA N.G.: Morobe Prov. Lakekamu Bas., Tekadu - Kakaro, 180m, Ivimka River Station.

Material examined. **Holotype** ♂ (NMW): “PAPUA N.G.: Morobe Prov. Lakekamu Bas., 2.-4.3.1998, Tekadu - Kakaro, 180m, Ivimka River Station, light, leg. A.Riedel”. **Paratypes** (NMW, CKB): 52♂♂, 56♀♀ with the same label as holotype; 1♀: “PAPUA N.G.: Morobe Prov. Lakekamu Bas., 3.3.1998, Tekadu - Kakaro, 170m, Ivimka River St., sifted, leg. Riedel”.

Diagnosis. Within the *G. picta* species group, *G. basalis* sp.nov. differs as follows: 1) head and disc of pro- and mesosternum microreticulate; 2) almost entire femora black; 3) mesotibiae constricted subapically with basal spine indistinct; 4) basal spine of male metatibiae very small; 5) apex of male ventrite 5 with basal yellow setae very long; 6) elytral intervals 5 and 7 indistinctly raised; 7) penis in lateral view curved and finely widened in apical third; 8) base of penis in lateral view distinctly produced ventrad.

Description. Body form elongate (Fig. 39); CL in ♂♂ (2.00 – 2.21 mm, \bar{S} = 2.10 ± 0.07), in ♀♀ (2.09 – 2.26 mm, \bar{S} = 2.17 ± 0.08); EW in ♂♂ (0.76 – 0.84 mm, \bar{S} = 0.80 ± 0.03), in ♀♀ (0.78 – 0.87 mm, \bar{S} = 0.82 ± 0.04); CL/EW in ♂♂ (2.57 – 2.63, \bar{S} = 2.61 ± 0.02), in ♀♀ (2.59 – 2.71, \bar{S} = 2.65 ± 0.05).

Colour pattern: pronotum with yellowish anterior margin; elytra with large prebasal spots reaching almost anterior third and pair of narrow oblique subapical spots.

Head. HW in ♂♂ (0.41 – 0.44 mm, \bar{S} = 0.42 ± 0.01), in ♀♀ (0.41 – 0.44 mm, \bar{S} = 0.43 ± 0.02); ID in ♂♂ (0.18 – 0.21 mm, \bar{S} = 0.19 ± 0.01), in ♀♀ (0.18 – 0.21 mm, \bar{S} = 0.19 ± 0.01); ED in ♂♂ (0.19 – 0.22 mm, \bar{S} = 0.21 ± 0.01), in ♀♀ (0.18 – 0.21 mm, \bar{S} = 0.20 ± 0.02); HW/ID in ♂♂ (2.14 – 2.33, \bar{S} = 2.22 ± 0.08), in ♀♀ (2.14 – 2.33, \bar{S} = 2.21 ± 0.09). Labrum almost glabrous, paler; anterior half with thin long setae; clypeus as long as labrum, plicate-microreticulate and sparsely setose; fronto-clypeal suture narrow; surface of frons and vertex same as on clypeus; eyes large, oval in lateral view and convex in dorsal view, with raised margin.

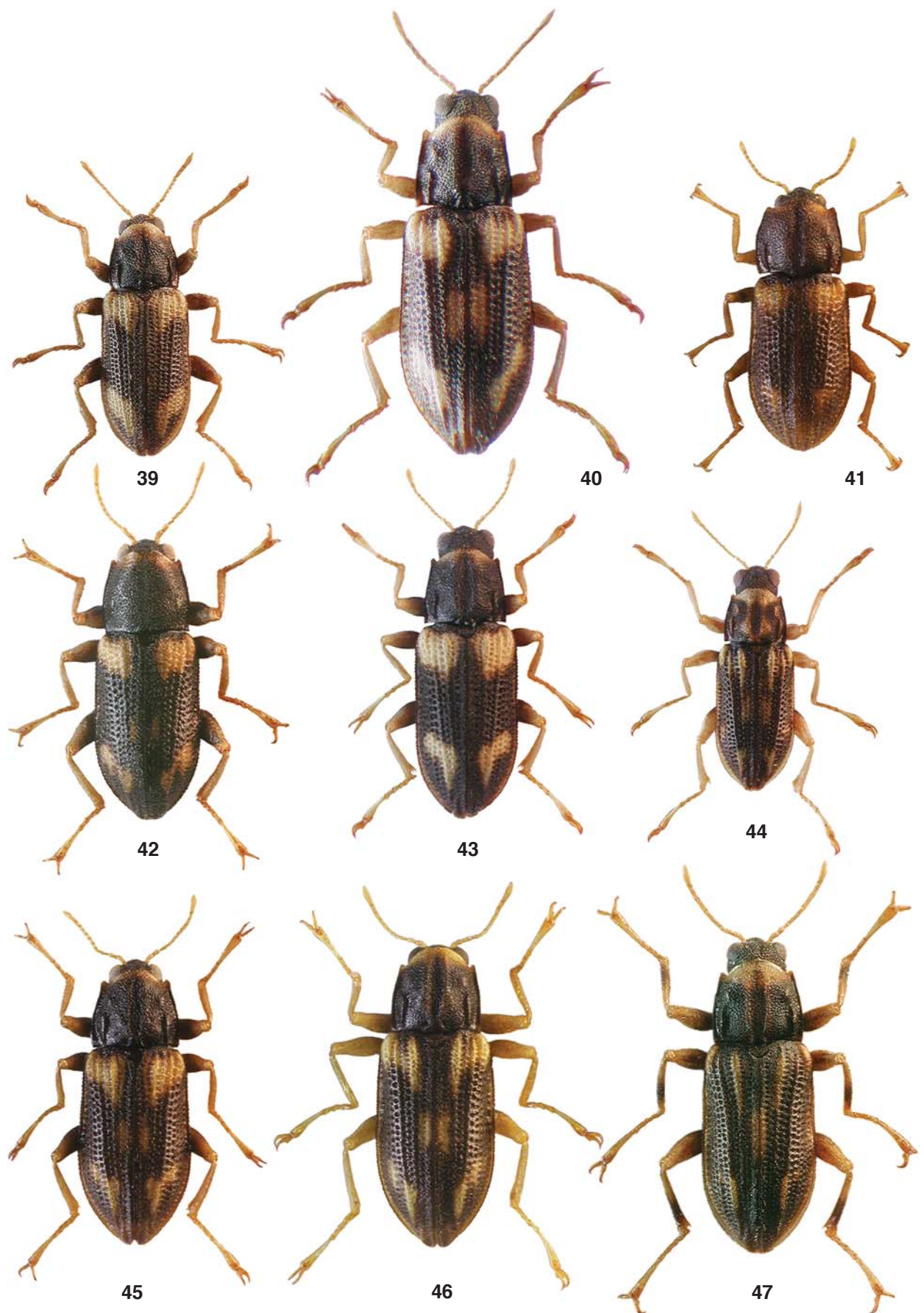
Thorax. Pronotum as wide as long, widest in basal half; PL in ♂♂ (0.59 – 0.65 mm, \bar{S} = 0.62 ± 0.02), in ♀♀ (0.59 – 0.68 mm, \bar{S} = 0.63 ± 0.03); PW in ♂♂ (0.59 – 0.65 mm, \bar{S} = 0.63 ± 0.02), in ♀♀ (0.59 – 0.66 mm, \bar{S} = 0.63 ±

0.03); AP in ♂♂ (0.46 – 0.49 mm, \bar{S} = 0.47 ± 0.01), in ♀♀ (0.46 – 0.51 mm, \bar{S} = 0.48 ± 0.02); lateral margins explanate; anterior angles almost acuminate produced; anterior sublateral tubercles indistinct; posterior tubercles carinate, reaching posterior pronotal margin; median groove large, plicate; lateral margins of groove raised, in immature specimens paler; prebasal admedian pits indistinct; surface plicate-microreticulate, with a few tiny, short setae; setae more dense on tubercles and margins of groove. Prosternum: prosternal process with sides subparallel; lateral margins finely raised; posterior margin with well developed narrow median protuberance; surface of prosternum microreticulate. Scutellum subtriangular, flat; anterior half glabrous, posterior half microreticulate. Mesosternum shallowly impressed mesally, without oblique microreticulate carinae; surface microreticulate. Metasternum about twice as long as mesosternum, sides convex in cross-section; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture widely depressed in about posterior two-thirds; lateral portions of disc covered by plastron structures; narrow area posteriorly of anterior margin and mesal portion along suture rough; disc of males admedially with sparse flattened yellow setae. Elytra with sides subparallel in anterior 0.7, then continuously converging toward nearly rounded apices; EL in ♂♂ (1.41 – 1.56 mm, \bar{S} = 1.49 ± 0.05), in ♀♀ (1.47 – 1.62 mm, \bar{S} = 1.54 ± 0.05); lateral margins distinctly explanate and serrate; striae punctures well impressed; interval 3 raised anteriorly; entire interval 5 and almost entire interval 7 finely raised; elytral surface finely plicate, matt, with a few short setae. Legs: femora microreticulate; tibiae almost glabrous; FT in ♂♂ (0.50 – 0.53 mm, \bar{S} = 0.51 ± 0.01), in ♀♀ (0.50 – 0.53 mm, \bar{S} = 0.52 ± 0.01); metatibiae of males constricted subapically, with indistinct basal spine; MT in ♂♂ (0.47 – 0.56 mm, \bar{S} = 0.51 ± 0.03), in ♀♀ (0.47 – 0.51 mm, \bar{S} = 0.50 ± 0.01); metatibiae of males (Fig. 148); HT in ♂♂ (0.56 – 0.60 mm, \bar{S} = 0.58 ± 0.02), in ♀♀ (0.56 – 0.60 mm, \bar{S} = 0.58 ± 0.02); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process flat; disc of process densely micropunctured; narrow mesal portion of ventrite 2 sparsely micropunctured, ventrites 3, 4 glabrous, ventrite 5 microreticulate; lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination distinctly produced posteriad; admedian setae very long; medio-apical portion more deeply impressed in males. Sternite 9 and spiculum gastrale (Fig. 50).

Aedeagus (Figs 48, 49). Penis slender; in lateral view curved with base distinctly produced ventrad; in ventral view parallel-sided with base widened; membranous endophallus with three sclerites; phallobasis short, almost 0.24× as long as penis.

Ovipositor (Fig. 51) with terminal segment slender and straight; preterminal segment about 3.6× as long as terminal, outer side concave; distal sclerite subquadrate, about half as long as preterminal; basal segment about 1.5× as long as preterminal and distal sclerites combined; ventral fulcrum finely curved in apical portion then straight.

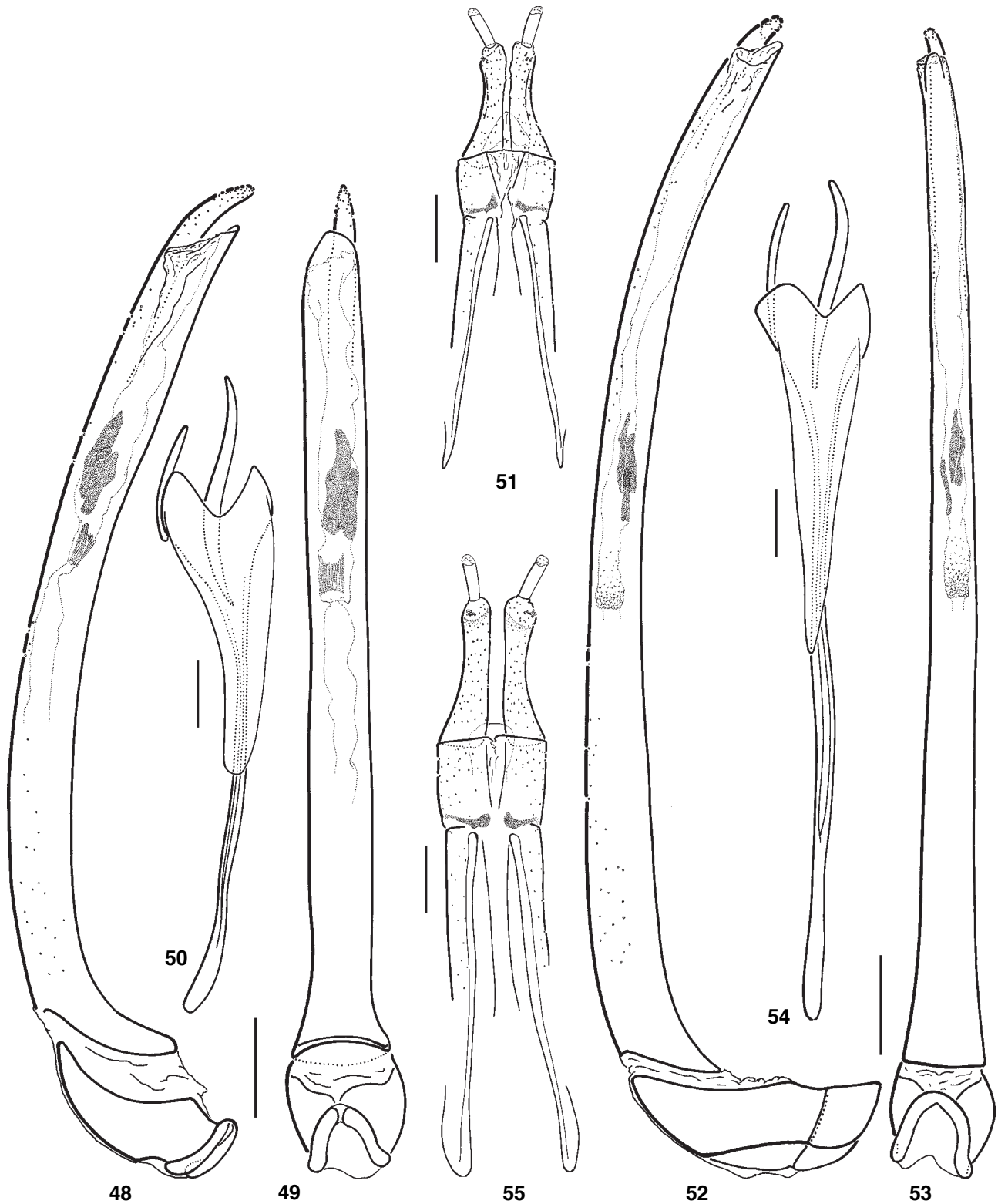


Figs 39–47 Habitus of: 39) *Graphelmis basalis* sp.nov.; 40) *Graphelmis hlavaci* sp.nov.; 41) *Graphelmis convexa* sp.nov.; 42) *Graphelmis tuberculata* sp.nov.; 43) *Graphelmis securipes* sp.nov.; 44) *Graphelmis schneideri* sp.nov.; 45) *Graphelmis oxytela* JÄCH; 46) *Graphelmis biroi* (BOLLOW); 47) *Graphelmis ceylonica* (MOTSCHULSKY).

Sexual dimorphism. Males are distinguished by widened and constricted meso- and metatibial apices and flattened setae on disc of metasternum. Sides of apical emargination of ventrite 5 distinctly more produced posteriorly in males.

Distribution. So far known only from Papua New Guinea.

Etymology. Named in reference to the distinctly produced base of penis.



Figs 48–55. 48–51 *Graphelmis basalis* sp.nov.: 48) aedeagus lateral view; 49) aedeagus ventral view; 50) spiculum gastrale and sternite 9; 51) ovipositor; 52–55 *Graphelmis hlavaci* sp.nov.: 52) aedeagus lateral view; 53) aedeagus ventral view; 54) spiculum gastrale and sternite 9; 55) ovipositor. Scale bars: 0.1mm.

***Graphelmis hlavaci* sp.nov.**

(Figs 40, 52–55, 149)

Type locality: PAPUA N.G.: Morobe Prov. Timini, 200–400m.

Material examined. Holotype ♂ (NMW): “PAPUA N.G.: Morobe Prov. Timini, 200–400m 7.4.1998 leg. A. Riedel”.

Paratypes (NMW, CKB): 12 ♂♂, 6 ♀♀ with the same label as holotype; 1 ♂: “Papua Nlle Guinée, Morobe, I.81 env. de Gurakor, W. G. Ulrich”.

Diagnosis. Within the *G. picta* species group, *G. hlavaci* sp.nov. differs as follows: 1) yellow elytral marking consists of 3 pairs of well demarcate maculae; 2) glabrous mesal portion of ventrites extremely narrow; 3) median protuberance of prosternal process wide; 4) elytral interval 2 distinctly raised apically; 5) pronotum plicate-micropunctured; 6) prosternal disc and process plicate-microreticulate; 7) penis in lateral view curved; 8) base of penis in lateral view acuminate produced ventrad.

Description. Body form elongate (Fig. 40); CL in ♂♂ (2.49 – 2.63 mm, \bar{S} = 2.57 ± 0.06), in ♀♀ (2.53 – 2.68 mm, \bar{S} = 2.59 ± 0.08); EW in ♂♂ (1.00 – 1.15 mm, \bar{S} = 1.05 ± 0.05), in ♀♀ (0.97 – 1.09 mm, \bar{S} = 1.02 ± 0.05); CL/EW in ♂♂ (2.29 – 2.53, \bar{S} = 2.45 ± 0.09), in ♀♀ (2.46 – 2.61, \bar{S} = 2.54 ± 0.05).

Colour pattern: pronotum with yellowish anterior margin; elytra with yellowish prebasal spots, elongate admedian stripes in middle and pair of narrow oblique subapical spots.

Head. HW in ♂♂ (0.47 – 0.56 mm, \bar{S} = 0.50 ± 0.03), in ♀♀ (0.50 – 0.53 mm, \bar{S} = 0.51 ± 0.02); ID in ♂♂ (0.21 – 0.26 mm, \bar{S} = 0.23 ± 0.02), in ♀♀ (0.24 – 0.26 mm, \bar{S} = 0.24 ± 0.01); ED in ♂♂ (0.24 – 0.26 mm, \bar{S} = 0.25 ± 0.01), in ♀♀ (0.24 – 0.26 mm, \bar{S} = 0.24 ± 0.01); HW/ID in ♂♂ (2.14 – 2.33, \bar{S} = 2.22 ± 0.08), in ♀♀ (2.00 – 2.25, \bar{S} = 2.10 ± 0.10). Labrum almost glabrous, paler with anterior half setose; clypeus as long as labrum, finely microreticulate and sparsely setose; fronto-clypeal suture narrow; surface of frons and vertex rough and sparsely setose; eyes large, oval in lateral view and convex in dorsal view, with raised margin.

Thorax. Pronotum about as wide as long, widest in basal half, black; PL in ♂♂ (0.69 – 0.78 mm, \bar{S} = 0.72 ± 0.03), in ♀♀ (0.71 – 0.76 mm, \bar{S} = 0.73 ± 0.02); PW in ♂♂ (0.74 – 0.82 mm, \bar{S} = 0.76 ± 0.03), in ♀♀ (0.74 – 0.79 mm, \bar{S} = 0.76 ± 0.03); AP in ♂♂ (0.56 – 0.63 mm, \bar{S} = 0.58 ± 0.03), in ♀♀ (0.57 – 0.63 mm, \bar{S} = 0.59 ± 0.02); lateral margins explanate, slightly raised; anterior angles produced; anterior sublateral tubercles fine; posterior tubercles carinate, reaching posterior pronotal margin; median groove deep, plicate; lateral margins of groove raised, almost carinate; prebasal admedian pits indistinct; surface plicate-microreticulate, with a few tiny, short setae on tubercles and margins of groove. Prosternum: prosternal process with sides parallel; lateral margins almost flat; posterior margin with wide median protuberance; surface of prosternum

finely plicate with a few micropunctures. Scutellum subtriangular, flat; surface except of glabrous anterior margin micropunctured. Mesosternum impressed mesally, with indistinct admedian transverse carinae reaching lateral margins; surface microreticulate. Metasternum about twice as long as mesosternum, sides convex in cross-section; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture depressed in posterior two-thirds (depression narrow in females, wider in males); almost entire surface covered by plastron structures; anterior margin and mesal portion along suture finely micropunctured or rough; disc of males admedially with flattened yellow setae. Elytra with sides subparallel in anterior two-thirds, then continuously converging toward nearly rounded apices; EL in ♂♂ (1.79 – 1.91 mm, \bar{S} = 1.85 ± 0.04), in ♀♀ (1.79 – 1.94 mm, \bar{S} = 1.86 ± 0.06); lateral margins explanate and serrate; striae punctures well impressed; interval 3 raised anteriorly; entire interval 5 finely raised; interval 7 finely raised in 0.5 – 0.75; elytral surface finely plicate; intervals with sparse short setae. Legs: femora finely microreticulate; tibiae almost glabrous; FT in ♂♂ (0.59 – 0.71 mm, \bar{S} = 0.64 ± 0.04), in ♀♀ (0.60 – 0.69 mm, \bar{S} = 0.64 ± 0.03); MT in ♂♂ (0.59 – 0.68 mm, \bar{S} = 0.63 ± 0.03), in ♀♀ (0.59 – 0.65 mm, \bar{S} = 0.62 ± 0.02); metatibiae of males (Fig. 149); HT in ♂♂ (0.65 – 0.76 mm, \bar{S} = 0.70 ± 0.04), in ♀♀ (0.68 – 0.76 mm, \bar{S} = 0.71 ± 0.03); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process depressed mesally (more in males); narrow mesal portion of process and ventrite 1 (in females also ventrite 2) densely micropunctured; narrow mesal portions of discs of remaining ventrites glabrous; admedian and lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination distinctly produced posteriad with long admedian setae; apex mesally mode deeply excised in males. Sternite 9 and spiculum gastrale (Fig. 54).

Aedeagus (Figs 52, 53). Penis slender; in lateral view curved with base slightly acuminate produced ventrad; in ventral view straight, slightly widened toward base; membranous endophallus with three sclerites; phallobasis short, almost 0.24× as long as penis.

Ovipositor (Fig. 55) with terminal segment slender, almost straight; preterminal segment about 3.5× as long as terminal, outer side concave; distal sclerite subquadrate, about half as long as preterminal; basal segment about 1.5× as long as preterminal and distal sclerites combined; ventral fulcrum almost straight.

Sexual dimorphism. Males are distinguished by widened and incised metatibial apices and flattened setae on disc of metasternum. Sides of apical emargination of ventrite 5 more distinctly produced posteriad in males.

Distribution. So far known only from Papua New Guinea.

Etymology. Named for friend, coleopterist Peter Hlaváč.

***Graphelmis convexa* sp.nov.**

(Figs 41, 56–59, 150)

Type locality: IRIAN JAYA: Paniai Prov. road Nabire – Ilaga, km 53, 700m.

Material examined. Holotype ♂ (NMW): “IRIAN JAYA: Paniai Prov. road Nabire – Ilaga, km 53, 17.9.1996, 700m leg. M. Balke (96 ♂ 23)”. **Paratypes** (NMW): 1♂, 2♀♀ with the same label as holotype.

Diagnosis. Within the *G. picta* species group, *G. convexa* sp.nov. differs as follows: 1) elytral yellow marking consists of 4 yellow spots; 2) eyes very small; 3) male metatibiae deeply excavated; 4) disc of prosternum plicate; 5) pronotal sides convex; 6) penis long and very slender.

Description. Habitus (Fig. 41); CL in ♂♂ (2.16, 2.24 mm), in ♀♀ (2.18, 2.32 mm); EW in ♂♂ (0.85, 0.91 mm), in ♀♀ (0.91, 0.96 mm), CL/EW in ♂♂ (2.45, 2.53), in ♀♀ (2.39, 2.43).

Colour pattern: pronotum with slightly paler anterior margin; elytra with yellowish prebasal and indistinct subapical spots.

Head. HW in ♂♂ (0.41, 0.46 mm), in ♀♀ (0.44, 0.47 mm); ID in ♂♂ (0.26, 0.28 mm), in ♀♀ (0.28, 0.29 mm); ED in ♂♂ (0.13, 0.15 mm), in ♀♀ (0.15, 0.16 mm); HW/ID in ♂♂ (1.56, 1.63), in ♀♀ (1.58, 1.60). Labrum almost glabrous in posterior half, micropunctured in anterior half; punctures setigerous; clypeus as long as labrum, microreticulate, with a few long setae; frons and vertex rough with thin sparse setae; eyes small, oval in lateral view and convex in dorsal view, without distinctly raised margin.

Thorax. Pronotum slightly wider than long, widest posteriorly of middle; PL in ♂♂ (0.66, 0.71 mm), in ♀♀ (0.65, 0.68 mm); PW in ♂♂ (0.72, 0.76 mm), in ♀♀ 0.74 mm; AP in ♂♂ (0.53, 0.59 mm), in ♀♀ 0.56 mm; lateral margins convex, finely explanate; anterior angles produced; sublateral tubercles distinct with long setae; anterior tubercles finely raised, rounded; posterior tubercles carinate, reaching posterior pronotal margin; median groove large, almost reaching pronotal margins; prebasal admedian pits reduced; surface densely irregularly micropunctured with sparse yellow setae. Prosternum: prosternal process parallel-sided; lateral margins finely raised; posterior margin with short, narrow median protuberance; surface of prosternum rough. Scutellum flat, almost glabrous in anterior half and more or less rough in posterior half. Mesosternum deeply impressed mesally; surface microreticulate or rough. Metasternum about twice as long as mesosternum, almost flat; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture finely depressed (wider and deeper in females) except short part posteriorly of anterior margin; almost whole surface of disc covered by plastron structures, narrow anterior part and median suture microreticulate; metasternal disc of males with long sparse yellow setae. Elytra with sides subparallel in anterior two-thirds (finely constricted in anterior about 0.3), then continuously converging toward almost rounded

apices; EL in ♂♂ (1.50, 1.53 mm), in ♀♀ (1.53, 1.65 mm); lateral margins distinctly explanate and serrate; striae punctures deeply impressed; intervals 3 and 5 finely raised; elytral surface rough with sparse long yellow setae. Legs: FT in ♂♂ 0.54 mm, in ♀♀ 0.50 mm; MT in ♂♂ (0.50, 0.56 mm), in ♀♀ (0.49, 0.50 mm); metatibiae slightly widened distally; distal ends of male metatibiae (Fig. 150); HT in ♂♂ (0.57, 0.60 mm), in ♀♀ (0.54, 0.57 mm); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process flat; mesal portion of disc of process and remaining ventrites microreticulate; lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination distinctly produced posteriad, especially in males. Sternite 9 and spiculum gastrale (Fig. 58).

Aedeagus (Figs 56, 57). Penis elongate, slender; in lateral view almost straight except of slightly curved apex and ventrally produced base; in ventral view straight, parallel-sided; base somewhat widened; membranous endophallus with 3 sclerotized structures; phallobasis short, less than 0.2× as long as penis.

Ovipositor (Fig. 59) with terminal segment straight, finely widened in middle; preterminal segment about 4.7× as long as terminal, outer side concave; distal sclerite subquadrate, about 0.5× as long as preterminal; basal segment about 1.2× as long as preterminal and distal sclerites combined; ventral fulcrum curved.

Sexual dimorphism. Males are distinguished by metatibial excavation, yellow setae on disc of metasternum and by more produced sides of apical emargination of ventrite 5.

Distribution. So far known only from the type locality.

Etymology. Named in reference to the shape of pronotal sides.

***Graphelmis tuberculata* sp.nov.**

(Figs 42, 60–63, 151)

Type locality: IRIAN JAYA: Paniai Prov. road Nabire – Ilaga, km 35 Kali Cemara.

Material examined. Holotype ♂ (NMW): “IRIAN JAYA: Paniai Prov. road Nabire – Ilaga, km 35 Kali Cemara, 23.10.1997, leg. M. Balke (♂ 13)”. **Paratypes** (NMW, CKB, NME): 27♂♂, 33♀♀ with the same label as holotype; 1♂: “INDONESIA, Irian Jaya Nabire distr., 150m NN Cemara river VIII.1998, leg. M. Balke”; 3♂♂, 4♀♀: “INDONESIA Irian Jaya Nabire, S road km 35, Bumi-River 13.I.1996 leg. Weigel”; 3♂♂, 4♀♀: “INDONESIA or. Irian Jaya 35km S Nabire Topo, Bumi Riv. 150m 13.I.1996 leg. A. Weigel”; 1♂: “INDONESIA Irian Jaya Nabire, S, km 120–150 Unipo-Ebomani 09.I.1997 leg. A. Weigel”.

Diagnosis. Within the *G. picta* species group, *G. tuberculata* sp.nov. differs as follows: 1) pronotal groove extremely reduced or absent; 2) admedian pronotal tubercles absent; 3) elytral punctures feebly impressed; 4) elytral interval 3 usually with distinct short prebasal tubercle; 5) metatibial spines of males very small; 6) anterior margin

of metasternum with median projection small; 7) base of penis distinctly produced ventrad in lateral view.

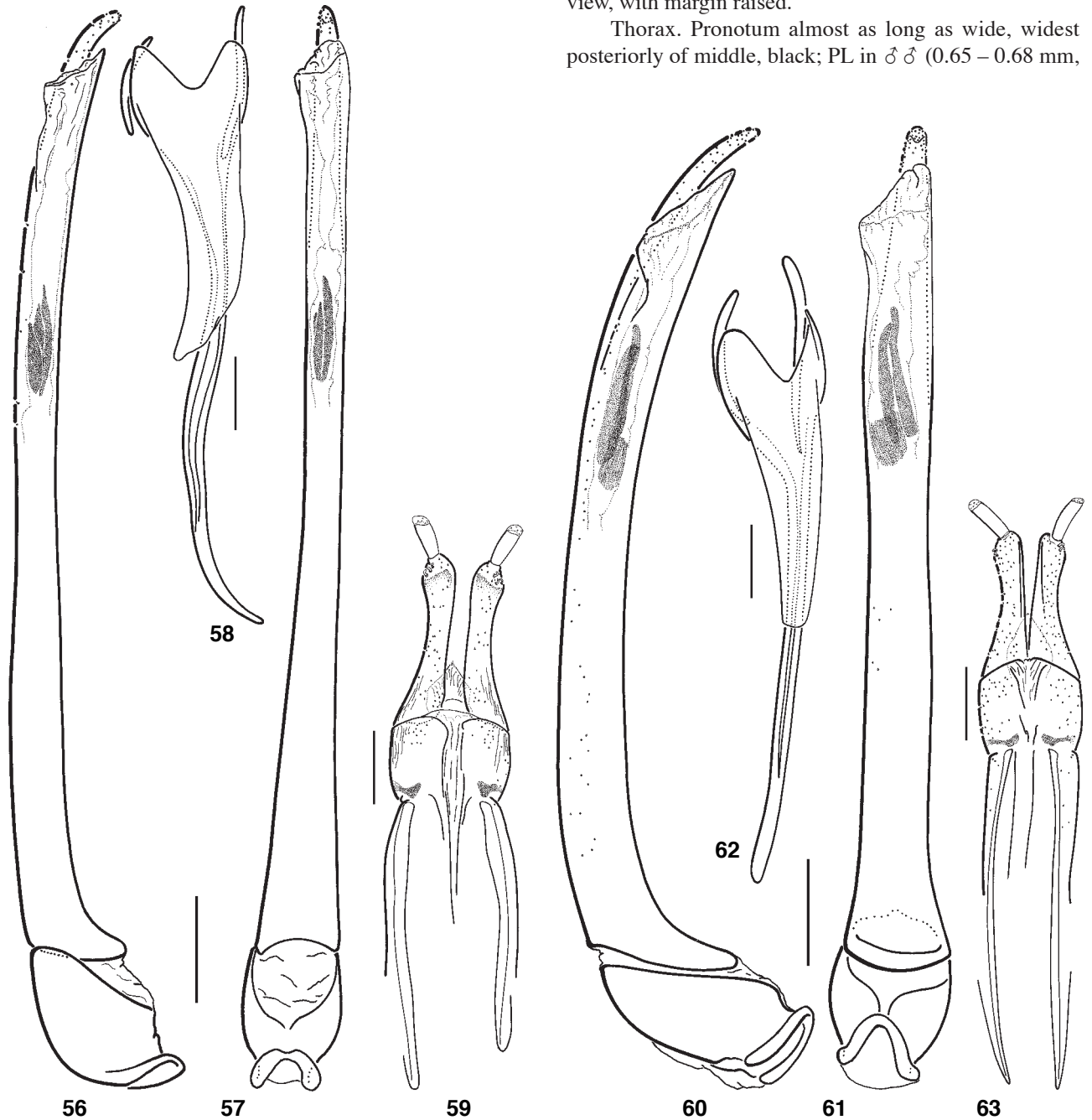
Description. Body form elongate (Fig. 42); CL in ♂♂ (2.12 – 2.24 mm, \bar{S} = 2.18 ± 0.04), in ♀♀ (2.16 – 2.44 mm, \bar{S} = 2.26 ± 0.11); EW in ♂♂ (0.79 – 0.87 mm, \bar{S} = 0.84 ± 0.03), in ♀♀ (0.81 – 0.91 mm, \bar{S} = 0.85 ± 0.04); CL/EW in ♂♂ (2.56 – 2.74, \bar{S} = 2.60 ± 0.07), in ♀♀ (2.59 – 2.69, \bar{S} = 2.66 ± 0.04).

Colour pattern: pronotum with anterior margin paler; elytra with two yellowish prebasal spots, elongated yel-

lowish admedian spots in middle and pair of irregular sub-apical spots.

Head. HW in ♂♂ (0.46 – 0.50 mm, \bar{S} = 0.47 ± 0.02), in ♀♀ (0.44 – 0.47 mm, \bar{S} = 0.46 ± 0.01); ID in ♂♂ (0.21 – 0.22 mm, \bar{S} = 0.21 ± 0.02), in ♀♀ (0.19 – 0.22 mm, \bar{S} = 0.21 ± 0.01); ED in ♂♂ (0.18 – 0.24 mm, \bar{S} = 0.21 ± 0.02), in ♀♀ (0.19 – 0.24 mm, \bar{S} = 0.22 ± 0.02); HW/ID in ♂♂ (2.07 – 2.29, \bar{S} = 2.21 ± 0.09), in ♀♀ (2.13 – 2.38, \bar{S} = 2.22 ± 0.10). Labrum almost glabrous, with fine pale setae; anterior margin paler; clypeus about as long as labrum, setose, anteriorly microreticulate, posteriorly rough; fronto-clypeal suture narrow; frons and vertex rough, sparsely setose; eyes large, oval in lateral view and convex in dorsal view, with margin raised.

Thorax. Pronotum almost as long as wide, widest posteriorly of middle, black; PL in ♂♂ (0.65 – 0.68 mm,



Figs 56–63. 56–59 *Graphelmis convexa* sp.nov.: 56) aedeagus lateral view; 57) aedeagus ventral view; 58) spiculum gastrale and sternite 9; 59) ovipositor; 60–63 *Graphelmis tuberculata* sp.nov.: 60) aedeagus lateral view; 61) aedeagus ventral view; 62) spiculum gastrale and sternite 9; 63) ovipositor. Scale bars: 0.1mm.

$\bar{S}=0.66 \pm 0.02$), in ♀♀ (0.65–0.76 mm, $\bar{S}=0.69 \pm 0.04$); PW in ♂♂ (0.68–0.71 mm, $\bar{S}=0.70 \pm 0.01$), in ♀♀ (0.66–0.76 mm, $\bar{S}=0.71 \pm 0.04$); AP in ♂♂ (0.51–0.54 mm, $\bar{S}=0.52 \pm 0.01$), in ♀♀ (0.51–0.59 mm, $\bar{S}=0.55 \pm 0.03$); lateral margins explanate; anterior angles produced; sublateral tubercles absent; median groove indistinct; prebasal admedian pits absent; surface densely micropunctured, with fine sparse setae anteriorly. Prosternum: prosternal process with sides parallel; lateral margins slightly raised; posterior margin with wide median protuberance; surface of prosternum plicate-microreticulate. Scutellum almost rounded, flat; surface irregularly micropunctured. Mesosternum impressed mesally; sides of disc convex in cross-section; surface microreticulate with sparse plication in posterior half. Metasternum about twice as long as mesosternum; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture depressed; depression in females narrow shorter, in males longer (posterior 0.75) and wider; almost entire surface covered by plastron structures; anterior margin and mesal portion along suture irregularly micropunctured or rough; disc of males admedially with long yellow setae. Elytra with sides subparallel in anterior two-thirds, then continuously converging toward nearly rounded apices; EL in ♂♂ (1.47–1.59 mm, $\bar{S}=1.52 \pm 0.04$), in ♀♀ (1.50–1.68 mm, $\bar{S}=1.57 \pm 0.07$); lateral margins explanate and serrate; striae punctures feebly impressed; interval 3 usually with short prebasal tubercle; intervals 5 and 7 almost flat; elytral surface rough; intervals with a few long setae. Legs: femora microreticulate; tibiae finely microreticulate in about posterior half; FT in ♂♂ (0.53–0.56 mm, $\bar{S}=0.55 \pm 0.01$), in ♀♀ (0.53–0.57 mm, $\bar{S}=0.55 \pm 0.02$); MT in ♂♂ (0.53–0.56 mm, $\bar{S}=0.55 \pm 0.01$), in ♀♀ (0.51–0.56 mm, $\bar{S}=0.54 \pm 0.02$); metatibiae of males slightly widened apicad; subapical incision shallow; apical spine indistinct (Fig. 151); HT in ♂♂ (0.59–0.65 mm, $\bar{S}=0.62 \pm 0.02$), in ♀♀ (0.56–0.63 mm, $\bar{S}=0.60 \pm 0.03$); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process depressed (more strongly in males); surface of process plicate-microreticulate in males, in females mesal portion microreticulate, sides of disc covered by plastron structures; narrow mesal portion of ventrites 1, 2 and anterior half of ventrite 3 microreticulate; mesal portion of remaining ventrites almost glabrous; admedian and lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination produced posteriad (more in males). Sternite 9 and spiculum gastrale (Fig. 62).

Aedeagus (Figs 60, 61). Penis slender; in lateral view curved, with base distinctly produced ventrad; in ventral view straight, subparallel with base slightly widened; membranous endophallus with 2 long and 1 short sclerites; phallobasis short, almost 0.26× as long as penis.

Ovipositor (Fig. 53) with terminal segment slender, almost straight; preterminal segment almost 3.4× as long as terminal, outer side concave; distal sclerite subquadrate, ca. 0.6× as long as preterminal; basal almost 1.4× as long

as preterminal and distal sclerites combined; ventral fulcrum finely curved.

Sexual dimorphism. Males are distinguished by metatibial apices incised and by long setae on disc of metasternum. Sides of apical emargination of ventrite 5 are more produced in males.

Distribution. So far known only from Irian Jaya (Indonesia).

Etymology. Named in reference to the tuberculate elytral interval 3.

***Graphelmis securipes* sp.nov.**

(Figs 43, 64–67, 152)

Type locality: IRIAN JAYA: Kabup. Nabire Wandammen penins., Yeretua 10m.

Material examined. Holotype ♂ (NMW): “IRIAN JAYA: Kabup. Nabire Wandammen penins., Yeretua 10m, 17.-20.8.1998, leg. M. Balke (WA17)”. **Paratypes** (NMW, CKB, NME): 12 ♂♂, 20 ♀♀ with the same label as holotype; 1 ♂: “IRIAN JAYA: Kabup. Nabire Wandammen penins., Yeretua 10m, 17.-20.8.1998, leg. M. Balke (WA18)”; 1 ♂, 1 ♀: “INDONESIA, Irian Jaya Nabire distr., Wondiwoi Mts., Yeretua IX.1998, 100m NN leg. M. Balke”; 3 ♂♂, 5 ♀♀: “INDONESIA Irian Jaya Nabire 70km, Kwatisore S km 60 W, Yamor lake 134°51'W, 03°38'S 04.III.1998 leg. A.Weigel KL”

Diagnosis. Within the *G. picta* species group, *G. securipes* sp.nov. differs as follows: 1) yellow elytral marking consists usually of 2 pairs of well demarcated maculae; 2) ventral side dark brown; 3) legs distinctly microreticulate; 4) male metatibial spines large and truncated; 5) base of penis in lateral view feebly produced ventrad; 6) head, and disc of pro- and mesosternum microreticulate; 7) femora except of apical portion dark brown.

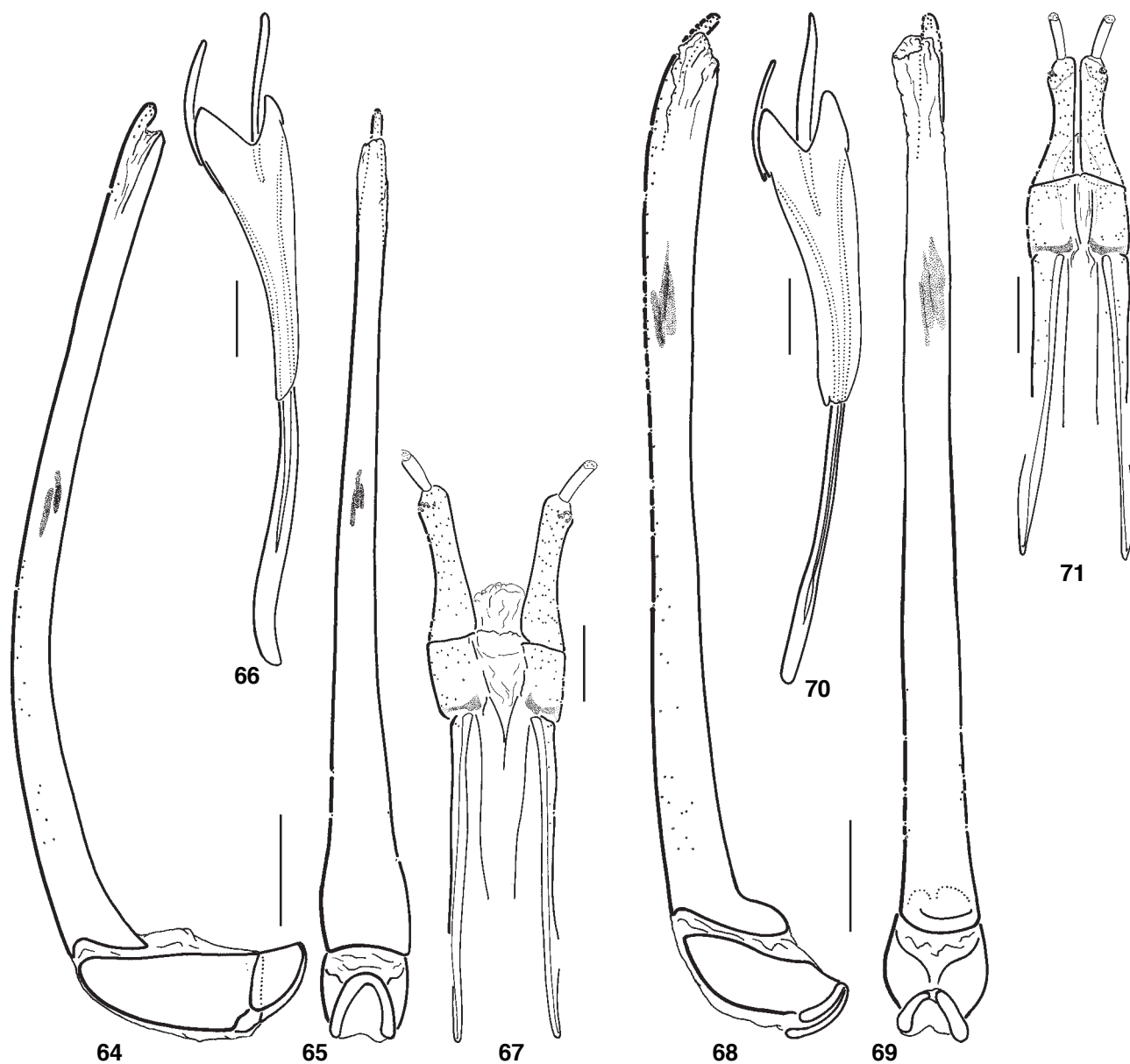
Description. Body form elongate (Fig. 43); CL in ♂♂ (1.99–2.18 mm, $\bar{S}=2.11 \pm 0.07$), in ♀♀ (2.09–2.22 mm, $\bar{S}=2.14 \pm 0.05$); EW in ♂♂ (0.77–0.88 mm, $\bar{S}=0.84 \pm 0.04$), in ♀♀ (0.82–0.87 mm, $\bar{S}=0.84 \pm 0.02$); CL/EW in ♂♂ (2.40–2.64, $\bar{S}=2.52 \pm 0.10$), in ♀♀ (2.47–2.61, $\bar{S}=2.54 \pm 0.05$).

Colour pattern: pronotum with yellowish, anterior margin (mesally widened); elytra with moderately large yellowish prebasal spots (reaching middle in few specimens) and curved subapical spots.

Head. HW in ♂♂ (0.40–0.47 mm, $\bar{S}=0.44 \pm 0.02$), in ♀♀ (0.44–0.47 mm, $\bar{S}=0.46 \pm 0.01$); ID in ♂♂ (0.18–0.22 mm, $\bar{S}=0.20 \pm 0.02$), in ♀♀ (0.19–0.22 mm, $\bar{S}=0.21 \pm 0.01$); ED in ♂♂ (0.19–0.22 mm, $\bar{S}=0.21 \pm 0.01$), in ♀♀ (0.19–0.24 mm, $\bar{S}=0.22 \pm 0.02$); HW/ID in ♂♂ (2.13–2.31, $\bar{S}=2.23 \pm 0.08$), in ♀♀ (2.13–2.38, $\bar{S}=2.22 \pm 0.10$). Labrum paler, micropunctured; punctures with long pale setae; clypeus about as long as labrum, microreticulate and sparsely setose; fronto-clypeal suture narrow; surface of frons and vertex microreticulate and sparsely setose; eyes large, oval in lateral view, convex in dorsal view, with margin raised.

Thorax. Pronotum almost as long as wide, widest posteriorly of middle, black; PL in ♂♂ (0.57–0.62 mm, $\bar{S}=0.60 \pm 0.02$), in ♀♀ (0.60–0.66 mm, $\bar{S}=0.63 \pm 0.02$); PW in ♂♂ (0.62–0.65 mm, $\bar{S}=0.64 \pm 0.01$), in ♀♀ (0.62–0.71 mm, $\bar{S}=0.68 \pm 0.03$); AP in ♂♂ (0.44–0.50 mm, $\bar{S}=0.48 \pm 0.02$), in ♀♀ (0.49–0.54 mm, $\bar{S}=0.51 \pm 0.02$); lateral margins explanate and slightly raised; anterior angles produced; anterior sublateral tubercles fine; posterior tubercles carinate, reaching posterior pronotal margin; median groove moderately deeply impressed; lateral margins of groove raised; prebasal admedian pits indistinct; surface microreticulate, with fine plication, sparse tiny setae on tubercles and margins of groove. Prosternum: prosternal process parallel-sided; lateral margins almost flat; posterior margin with wide median protuberance; surface

of prosternum finely microreticulate; surface of process plicate-microreticulate in males and microreticulate in females. Scutellum subtriangular, flat; surface microreticulate, anterior margin glabrous. Mesosternum impressed mesally; sides of disc convex in cross-section; surface microreticulate. Metasternum about twice as long as mesosternum, sides more or less convex in cross-section; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture depressed in about posterior two-thirds (depression narrow in females, wider in males); almost entire surface covered by plastron structures; anterior margin and mesal portion along suture finely micropunctured or rough; disc of males admedially with flattened yellow setae. Elytra with sides subparallel about in anterior two-thirds, then continuously converging to-



Figs 64–71. 64–67 *Graphelmis securipes* sp.nov.: 64) aedeagus lateral view; 65) aedeagus ventral view; 66) spiculum gastrale and sternite 9; 67) ovipositor; 68–71 *Graphelmis schneideri* sp.nov.: 68) aedeagus lateral view; 69) aedeagus ventral view; 70) spiculum gastrale and sternite 9; 71) ovipositor. Scale bars: 0.1mm.

ward nearly rounded apices; EL in ♂♂ (1.41 – 1.56 mm, $\bar{S}=1.51 \pm 0.05$), in ♀♀ (1.47 – 1.56 mm, $\bar{S}=1.51 \pm 0.03$); lateral margins explanate and serrate; strial punctures well impressed; interval 3 raised anteriorly; entire interval 5 entirely finely raised; interval 7 almost flat; elytral surface finely plicate; intervals with sparse short setae. Legs microreticulate; FT in ♂♂ (0.50 – 0.53 mm, $\bar{S}=0.50 \pm 0.01$), in ♀♀ (0.47 – 0.53 mm, $\bar{S}=0.50 \pm 0.02$); MT in ♂♂ (0.46 – 0.50 mm, $\bar{S}=0.49 \pm 0.02$), in ♀♀ (0.47 – 0.50 mm, $\bar{S}=0.48 \pm 0.01$); metatibiae of males widened subapically then widely incised; apical spine large, with apex truncated (Fig. 152); HT in ♂♂ (0.51 – 0.56 mm, $\bar{S}=0.54 \pm 0.02$), in ♀♀ (0.51 – 0.56 mm, $\bar{S}=0.53 \pm 0.01$); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process finely depressed mesally (more strongly in males); narrow mesal portion of process and ventrites microreticulate; admedian and lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination produced posteriad (about equally in both sexes); produced sides slightly wider separated in females; admedian setae pale. Sternite 9 and spiculum gastrale (Fig. 66).

Aedeagus (Figs 64, 65). Penis slender; in lateral view curved with base almost acuminate produced ventrad; in ventral view subparallel; membranous endophallus with three weak sclerites; phallobasis short, almost 0.3× as long as penis.

Ovipositor (Fig. 67) with terminal segment slender and almost straight; preterminal segment about 3.6× as long as terminal, outer side concave; distal sclerite subquadrate, almost half as long as preterminal; basal segment ca. 1.4× as long as preterminal and distal sclerites combined; ventral fulcrum almost straight.

Sexual dimorphism. Males are distinguished by widened and incised metatibial apices and flattened setae on disc of metasternum. Sides of apical emargination of ventrite 5 are rather wider separated in females.

Distribution. So far known only from Irian Jaya (Indonesia).

Etymology: from Latin *securis* – axe in reference to the almost axe-like metatibiae of males.

***Graphelmis schneideri* sp.nov.**

(Figs 44, 68–71, 153)

Type locality: Indonesia/Kalimantan W Nanga Ela environment, Nanga Nyuruh 700m.

Material examined. Holotype ♂ (NMW): “Indonesia/Kalimantan W Nanga Ela env. 4.-10.8.Nanga Nyuruh 700m, J. Schneider lgt. 1993”. **Paratypes** (NMW): 2♂, 1♀ with the same label as holotype.

Diagnosis. Within the *G. picta* species group, *G. schneideri* sp.nov. differs as follows: 1) pronotal tubercles distinct, yellowish; 2) posterior pronotal tubercles not reaching posterior margin of pronotum; 3) metasternum raised in anterior third; 4) base of penis produced almost perpen-

dicular; 5) male metatibiae curved subapically, subapical setae extremely long.

Description. Body form elongate (Fig. 44); CL in ♂♂ 1.76, 1.78 mm, in ♀ 1.90 mm; EW in ♂♂ 0.71, 0.75 mm, in ♀ 0.74 mm; CL/EW in ♂♂ 2.38, 2.50, in ♀ 2.58.

Colour pattern: pronotum with yellowish anterior margin (widened mesally), lateral margins of median groove and tubercles; elytra with yellowish prebasal portions of intervals 3 and 5, humeri, more or less distinctly yellow elongated admedian spots in middle and two pairs of slightly elongated subapical spots.

Head. HW in ♂♂ 0.56, 0.57 mm, in ♀ 0.44 mm; ID in ♂♂ 0.19 mm, in ♀ 0.19 mm; ED in ♂♂ 0.21, 0.22 mm, in ♀ 0.24 mm; HW/ID in ♂♂ 2.15, 2.31, in ♀ 2.31. Labrum paler; surface glabrous with dense long pale setae; clypeus about as long as labrum, microreticulate and setose; fronto-clypeal suture narrow; frons and vertex microreticulate and sparsely setose; eyes large, almost rounded in lateral view and convex in dorsal view, with raised margin.

Thorax. Pronotum wider than long, widest in about basal third; PL in ♂♂ 0.50, 0.53 mm, in ♀ 0.51 mm; PW in ♂♂ 0.56, 0.59 mm, in ♀ 0.59 mm; AP in ♂♂ 0.44 mm, in ♀ 0.47 mm; lateral margins explanate; anterior angles produced; anterior sublateral tubercles rounded; posterior tubercles carinate, not reaching posterior pronotal margin; median groove large and shallow; lateral margins slightly raised; prebasal admedian pits shallow; surface microreticulate, with sparse tiny setae; tubercles, lateral margins of groove and posterior pronotal margin almost glabrous. Prosternum: prosternal process with sides parallel; lateral margins almost flat, microreticulate; posterior margin with well projected median protuberance; surface microreticulate. Scutellum almost rounded or subtriangular, flat; surface shiny. Mesosternum impressed mesally; surface microreticulate. Metasternum about twice as long as mesosternum, anterior third raised; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture feebly depressed in posterior two-thirds; almost entire surface covered by plastron structures; anterior margin and mesal portion along suture glabrous; disc of males admedially with a few longer yellow setae. Elytra with sides parallel in anterior two-thirds, then continuously converging toward nearly rounded apices; EL in ♂♂ 1.25, 1.26 mm, in ♀ 1.38 mm; lateral margins paler, explanate and serrate; strial punctures well impressed; interval 3 tuberculate anteriorly; almost entire interval 5 slightly carinate; elytral surface finely plicate; intervals with sparse tiny setae. Legs pale; surface almost glabrous; FT in ♂♂ 0.50, 0.54 mm, in ♀ 0.50 mm; MT in ♂♂ 0.47, 0.51 mm, in ♀ 0.47 mm; metatibiae of males (Fig. 153); HT in ♂♂ 0.56, 0.57 mm, in ♀ 0.56 mm; length of tarsomere 5 equal to combined length of tarsomeres 1 – 4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process almost flat; disc of process and ventrite 1 microreticulate; discs of remaining ventrites glabrous; lateral portions of ventrites covered by plastron structures; apex of male ventrite 5 emarginate, with sides of

emargination slightly produced posteriad. Sternite 9 and spiculum gastrale (Fig. 70).

Aedeagus (Figs 68, 69). Penis slender; in lateral view almost straight; base distinctly, almost perpendicularly produced ventrad. Penis in ventral view almost straight, slightly widened toward base; membranous endophallus with three weak sclerites; phallobasis short, less than 0.2× as long as penis.

Ovipositor (Fig. 71) with terminal segment slender and almost straight; preterminal segment about 3.25× as long as terminal, outer side concave; distal sclerite subquadrate, 0.64× as long as preterminal; basal segment about 1.5× as long as preterminal and distal sclerites combined; ventral fulcrum almost straight.

Sexual dimorphism. Males are well distinguished by modified metatibial apices and yellow setae on disc of metasternum.

Distribution. So far known only from Kalimantan (Indonesia).

Etymology. Named for the collector of the species.

Graphelmis oxytela JÄCH, 1985

(Figs 45, 154)

Graphelmis oxytela JÄCH, 1985: 233-234, Figs 2, 8

Type locality: Papua Neu Guinea, Madang, Umg. Madang

Material examined. Paratypes (NMW): 3 ♂♂: "VI 79 PNG/Madang Umg. Madang". **Additional material** (NMW): 3 ♂♂, 2 ♀♀: "PAPUA NG 7./8.88 Sepik-Ramu Basin ♂6 leg. Dudgeon".

Diagnosis. Within the *G. picta* species group, *G. oxytela* JÄCH, 1985 differs as follows: 1) pronotum plicate-micropunctured; 2) elytral sides slightly diverging in anterior 0.7; 3) elytral apices diverging.

Redescription. Body form elongate (Fig. 45); CL in ♂♂ (2.31 – 2.46 mm, \bar{S} = 2.39 ± 0.07), in ♀♀ 2.41, 2.51 mm; EW in ♂♂ (0.95 – 1.00 mm, \bar{S} = 0.97 ± 0.02), in ♀♀ 0.95, 0.97 mm, CL/EW in ♂♂ (2.39 – 2.53, \bar{S} = 2.46 ± 0.05), in ♀♀ 2.54, 2.58.

Colour pattern: pronotum with slightly paler anterior margin; elytra with yellowish humeral spots separated mesally (admedially extending posteriad), short distinctly yellowish admedian stripes in about midlength and pair of narrow oblique stripes in about 0.75.

Head. HW in ♂♂ (0.47 – 0.50 mm, \bar{S} = 0.48 ± 0.01), in ♀♀ 0.50, 0.53 mm; ID in ♂♂ (0.21 – 0.25 mm, \bar{S} = 0.23 ± 0.02), in ♀♀ 0.24, 0.25 mm; ED in ♂♂ (0.22 – 0.24 mm, \bar{S} = 0.22 ± 0.01), in ♀♀ 0.24, 0.24 mm; HW/ID in ♂♂ (1.94 – 2.29, \bar{S} = 2.10 ± 0.13), in ♀♀ 2.12, 2.13 mm. Labrum with setigerous punctures in anterior half, posterior half glabrous, anterior margin paler; clypeus about as long as labrum, mesally raised, glabrous, except of punctured sides; fronto-clypeal suture deeply depressed; frons and vertex plicate-microreticulate; eyes large, oval in lateral view and convex in dorsal view, with raised margin on inner side.

Thorax. Pronotum slightly wider than long, widest in basal half; PL in ♂♂ (0.67 – 0.69 mm, \bar{S} = 0.68 ± 0.01), in ♀♀ 0.67, 0.72 mm; PW in ♂♂ (0.72 – 0.77 mm, \bar{S} = 0.75 ± 0.02), in ♀♀ 0.69, 0.77 mm; AP in ♂♂ (0.54 – 0.56 mm, \bar{S} = 0.55 ± 0.01), in ♀♀ 0.56, 0.59 mm; lateral margins explanate; anterior angles produced; anterior sublateral tubercles weak; posterior tubercles less than half as long as PL, carinate, reaching posterior pronotal margin; median groove large; lateral margins of groove raised; prebasal admedian pits vestigial; surface sparsely setose, plicate-micropunctured. Prosternum with disc plicate-microreticulate; prosternal process flat, with lateral margins microreticulate, raised; posterior margin with wide median protuberance. Scutellum subtriangular, flat; surface sparsely micropunctured. Mesosternum impressed mesally, without oblique microreticulate carinae; surface microreticulate. Metasternum about twice as long as mesosternum; disc narrowly depressed along median longitudinal suture; admedian prebasal punctures absent; sublateral carinae absent; surface covered by plastron structures except of microreticulate anterior margin and narrow median portion along suture; disc of males with longer yellow setae. Elytra with sides slightly diverging in anterior about 0.7, then continuously converging toward slightly diverging apices; EL in ♂♂ (1.64 – 1.79 mm, \bar{S} = 1.72 ± 0.07), in ♀♀ 1.74, 1.79 mm; lateral margins explanate and densely serrate; striae punctures large, moderately deeply impressed, deeper on sides; interval 3 distinctly raised anteriorly, intervals 5 and 7 weakly raised; surface rough with sparse short setae. Legs dark yellow; femora microreticulate; tibiae finely micropunctured and grooved; FT in ♂♂ (0.59 – 0.65 mm, \bar{S} = 0.61 ± 0.02), in ♀♀ 0.59, 0.65 mm; MT in ♂♂ (0.54 – 0.62 mm, \bar{S} = 0.57 ± 0.03), in ♀♀ 0.57, 0.62 mm; apex of male metatibiae (Fig. 154); HT in ♂♂ (0.62 – 0.69 mm, \bar{S} = 0.66 ± 0.03), in ♀♀ 0.66, 0.68 mm; length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process slightly depressed mesally; mesal portion of process and disc of ventrites microreticulate (reticulation diminishing toward apex); lateral portions of process and ventrites covered by plastron structures; apex of ventrite 5 mesally deeply emarginate, with sides of apical emargination produced posteriad.

Aedeagus. Penis in lateral view slightly curved, base almost acuminate produced ventrad.

Sexual dimorphism. Males are distinguished by modified metatibiae, longer yellow setae on disc of metasternum and by more produced sides of apical emargination of ventrite 5.

Distribution. Papua New Guinea.

Graphelmis biroi (BOLLOW, 1942)

(Fig. 46)

Stenelmis biroi BOLLOW, 1942: 197-200, Figs 1-3

Graphelmis biroi JÄCH, 1984: 236, Fig. 5

Type locality: Erima, Astrolabe Bai

Material examined. (NMW): 1 ♀: "XII 78 PNG/Morobe

Umg. Kaiapit"; 1 ♀: "PAPUA NEW GUINEA Jimi Valley 21.-27.VII.1981 leg. G. Hangay and M. Dingley"

Diagnosis. Within the *G. picta* species group, *G. biroi* (BOLLOW) differs as follows: 1) frons and vertex plicate-micropunctured; 2) raised margins along median pronotal groove shiny; 3) pronotum plicate-micropunctured; 4) legs yellow; 5) elytral apices slightly produced. Form of the male metatibial apex unknown, while only two ♀♀ were studied.

Redescription. Body form elongate (Fig. 46); CL in ♀♀ 2.54, 2.69 mm; EW in ♀♀ 1.03, 1.03 mm; CL/EW in ♀♀ 2.48, 2.63.

Colour pattern: pronotum black with narrow yellowish anterior margin; elytra with yellowish humeri, raised prebasal portion of interval 3 (sometimes fused with humeral marking), short mesal portion of sutural intervals and short portions of intervals 5 and 7 in about 0.7 (sometimes fused together).

Head. HW in ♀♀ 0.53, 0.57 mm; ID in ♀♀ 0.25, 0.26 mm; ED in ♀♀ 0.26, 0.26 mm; HW/ID in ♀♀ 2.12, 2.17. Labrum with setigerous punctures in anterior half, posterior half glabrous; anterior margin paler; clypeus as long as labrum, rough, with mesal portion raised; frontoclypeal suture depressed; frons depressed between antennae; vertex plicate-micropunctured with short tiny setae; eyes large, oval in lateral view and convex in dorsal view, with margins raised on inner side.

Thorax. Pronotum about as wide as long, widest posteriorly of middle or in basal half; PL in ♀♀ 0.82, 0.82 mm; PW in ♀♀ 0.77, 0.82; AP in ♀♀ 0.62, 0.64 mm; lateral margins explanate; anterior angles produced; anterior sublateral tubercles small, rounded; posterior tubercles almost half as long as PL, carinate, reaching posterior pronotal margin; median groove large and deep; lateral margins of groove raised with sparse punctures; interstices shiny; prebasal admedian pits small; surface plicate-micropunctured, with sparse tiny setae. Prosternum with disc almost glabrous in anterior half and plicate in posterior half; prosternal process plicate-microreticulate, with lateral margins almost flat, microreticulate; posterior margin with wide, feebly projected median protuberance. Scutellum almost rounded, flat; surface rough. Mesosternum impressed mesally, without oblique microreticulate carinae; surface plicate-microreticulate. Metasternum about twice as long as mesosternum; disc slightly narrowly depressed along longitudinal suture; admedian prebasal punctures absent; sublateral carinae absent; surface covered by plastron structures. Elytra parallel-sided in anterior about 0.6, then converging toward slightly produced apices; EL in ♀♀ 1.72, 1.87 mm; lateral margins explanate and finely serrate; striae punctures large, moderately deeply impressed (deeper on sides); interval 3 raised anteriorly, intervals 5 and 7 only slightly raised; surface rough with sparse short setae. Legs yellow; femora almost glabrous; tibiae finely micropunctured and grooved; FT in ♀♀ 0.68, 0.71 mm; MT in ♀♀ 0.65, 0.74 mm; HT in ♀♀ 0.72, 0.78 mm;

length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process depressed mesally; mesal portion of process and disc of ventrites densely irregularly micropunctured; lateral portions of process and ventrites covered by plastron structures; apex of ventrite 5 emarginated mesally, with sides of emargination produced posteriorly.

Sexual dimorphism. There were no male specimens available within the study, so the features distinguishing the sexes could not be exactly described.

Distribution. Papua New Guinea.

***Graphelmis ceylonica* (MOTSCHULSKY, 1859)**
(Fig. 47, 155)

Stenelmis ceylonicus MOTSCHULSKY, 1859: 49.

Graphelmis ceylonica DELÈVE, 1973: 12-14, Figs 24, 25

Type locality: Ceylon, Noura Ellia mountains

Material examined. (NMW,CKB): 5 ♂♂, 1 ♀: "CEYLON 29.12.80 Kitulgala-Umg. leg. M. Jäch C45d"; 1 ♀: "CEYLON 9.12.80 Haputale Umg. leg. M. Jäch C36"; 1 ♂, 2 ♀♀: "Ceylon 18.12.1980 Badulla-Umg. leg. M. Jäch C43, Ambaragaha Oya"; 2 ♂♂, 2 ♀♀ (Coll. R.I.Sc.N. Bruxelles): "Ceylon, Sabaragamuwa, Prov. Kitulgala, 21mls N Ratnapura, 17.III.62, Loc. 152"; 1 ♂: "Ceylon, Sabaragamuwa, Prov. Bopathella Falls, 9mls NNW Ratnapura, 19.II.62, Loc. 91:II".

Diagnosis. Within the *G. picta* species group, *G. ceylonica* (MOTSCHULSKY) differs as follows: 1) frons plicate-microreticulate; 2) tibiae darkened in posterior half; 3) pronotal and elytral coloration weak; 4) pronotum plicate-microreticulate; 5) penis widened subapically in lateral view.

Redescription. Body form elongate (Fig. 47); CL in ♂♂ (2.29 – 2.60 mm, $\bar{S}=2.43 \pm 0.10$), in ♀♀ (2.41 – 2.65 mm, $\bar{S}=2.56 \pm 0.10$); EW in ♂♂ (0.93 – 1.03 mm, $\bar{S}=0.97 \pm 0.04$), in ♀♀ (0.94 – 1.00 mm, $\bar{S}=0.98 \pm 0.03$), CL/EW in ♂♂ (2.41 – 2.58, $\bar{S}=2.51 \pm 0.06$), in ♀♀ (2.56 – 2.69, $\bar{S}=2.61 \pm 0.06$).

Colour pattern: pronotum with yellowish anterior margin (widened mesally), margins along median groove indistinctly paler; elytra with yellowish: humeri, raised prebasal portion of interval 3, short prebasal portion of interval 5, short mesal portion of sutural intervals and short portions of intervals 5 and 7 in about 0.7.

Head. HW in ♂♂ (0.50 – 0.53 mm, $\bar{S}=0.51 \pm 0.02$), in ♀♀ (0.50 – 0.56 mm, $\bar{S}=0.53 \pm 0.02$); ID in ♂♂ (0.25 – 0.28 mm, $\bar{S}=0.26 \pm 0.01$), in ♀♀ (0.26 – 0.29 mm, $\bar{S}=0.27 \pm 0.01$); ED in ♂♂ (0.24 – 0.26 mm, $\bar{S}=0.25 \pm 0.01$), in ♀♀ (0.24 – 0.26 mm, $\bar{S}=0.25 \pm 0.02$); HW/ID in ♂♂ (1.89 – 2.00, $\bar{S}=1.93 \pm 0.06$), in ♀♀ (1.89 – 2.00, $\bar{S}=1.95 \pm 0.06$). Labrum with setigerous punctures in anterior half, posterior half glabrous, anterior margin paler; clypeus about as long as labrum, mesally raised, anterior two-thirds glabrous, posterior third finely micropunctured; fronto-

clypeal suture slightly depressed; frons plicate-microreticulate; vertex microreticulate; eyes moderately large, oval in lateral view and convex in dorsal view, with raised margin on inner side.

Thorax. Pronotum slightly wider than long, widest in basal third; PL in ♂♂ (0.68–0.74 mm, $\bar{S}=0.71\pm0.02$), in ♀♀ (0.71–0.79 mm, $\bar{S}=0.76\pm0.04$); PW in ♂♂ (0.74–0.79 mm, $\bar{S}=0.76\pm0.02$), in ♀♀ (0.74–0.79 mm, $\bar{S}=0.77\pm0.03$); AP in ♂♂ (0.53–0.60 mm, $\bar{S}=0.56\pm0.03$), in ♀♀ (0.59–0.60 mm, $\bar{S}=0.59\pm0.01$); lateral margins explanate; anterior angles produced; anterior sublateral tubercles weak, almost rounded; posterior tubercles almost half as long as PL, carinate, reaching posterior pronotal margin; median groove large; lateral margins of groove raised, somewhat carinate; prebasal admedian pits small; surface sparsely setose, plicate-microreticulate, plication more distinct on anterior half. Prosternum with disc flat, microreticulate; prosternal process with lateral margins almost flat, microreticulate; posterior margin with moderately projected median protuberance. Scutellum almost rounded, slightly wider than long, flat; surface densely micropunctured. Mesosternum impressed mesally, without oblique microreticulate carinae; surface microreticulate. Metasternum about twice as long as mesosternum; disc almost flat; longitudinal suture narrow, shallowly impressed in posterior 0.75; admedian prebasal punctures transverse; sublateral carinae absent; surface covered by plastron structures except of microreticulate anterior margin and narrow median portion along suture; disc of males with sparse pale setae. Elytra parallel-sided in anterior 0.7, then continuously converging toward almost acuminate apices; EL in ♂♂ (1.62–1.87 mm, $\bar{S}=1.72\pm0.08$), in ♀♀ (1.71–1.85 mm, $\bar{S}=1.80\pm0.07$); lateral margins explanate and finely serrate; striae punctures large, moderately deeply impressed, deeper on sides; interval 3 raised and widened anteriorly; entire interval 5 slightly raised; interval 7 finely raised in posterior about 0.4; surface rough with sparse short setae. Legs dark yellow; femora almost glabrous; tibiae finely micropunctured and grooved; FT in ♂♂ (0.66–0.69 mm, $\bar{S}=0.67\pm0.01$), in ♀♀ (0.62–0.71 mm, $\bar{S}=0.67\pm0.04$); MT in ♂♂ (0.68–0.69 mm, $\bar{S}=0.68\pm0.01$), in ♀♀ (0.62–0.68 mm, $\bar{S}=0.66\pm0.03$); apex of male metatibiae (Fig. 155); HT in ♂♂ (0.71–0.74 mm, $\bar{S}=0.72\pm0.01$), in ♀♀ (0.71–0.76 mm, $\bar{S}=0.74\pm0.02$); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process flat; mesal portion of process and disc of ventrites microreticulate; lateral portions of process and ventrites covered by plastron structures; apex of ventrite 5 shallowly emarginate mesally, with sides of emargination feebly produced posteriad.

Aedeagus. Penis long and slender, in lateral view slightly widened in anterior half with apex slightly curved and base moderately produced ventrad.

Sexual dimorphism. Males are distinguished by widened metatibial apices with apical spines, yellow setae on disc of metasternum and by more produced sides of apical emargination of ventrite 5.

Distribution. Ceylon.

Graphelmis loebli sp.nov.

(Figs 72, 81–84, 156)

Type locality: IRIAN JAYA: Nabire Prov., Nabire - Ilaga, km 35 Kali Cemara.

Material examined. Holotype ♂ (NMW): "IRIAN JAYA: Nabire Prov., Nabire - Ilaga, km 35 Kali Cemara, 23.10.1997, leg. M. Balke (♂13)". Paratypes (NMW, CKB): 16♂♂, 16♀♀ with the same label as holotype.

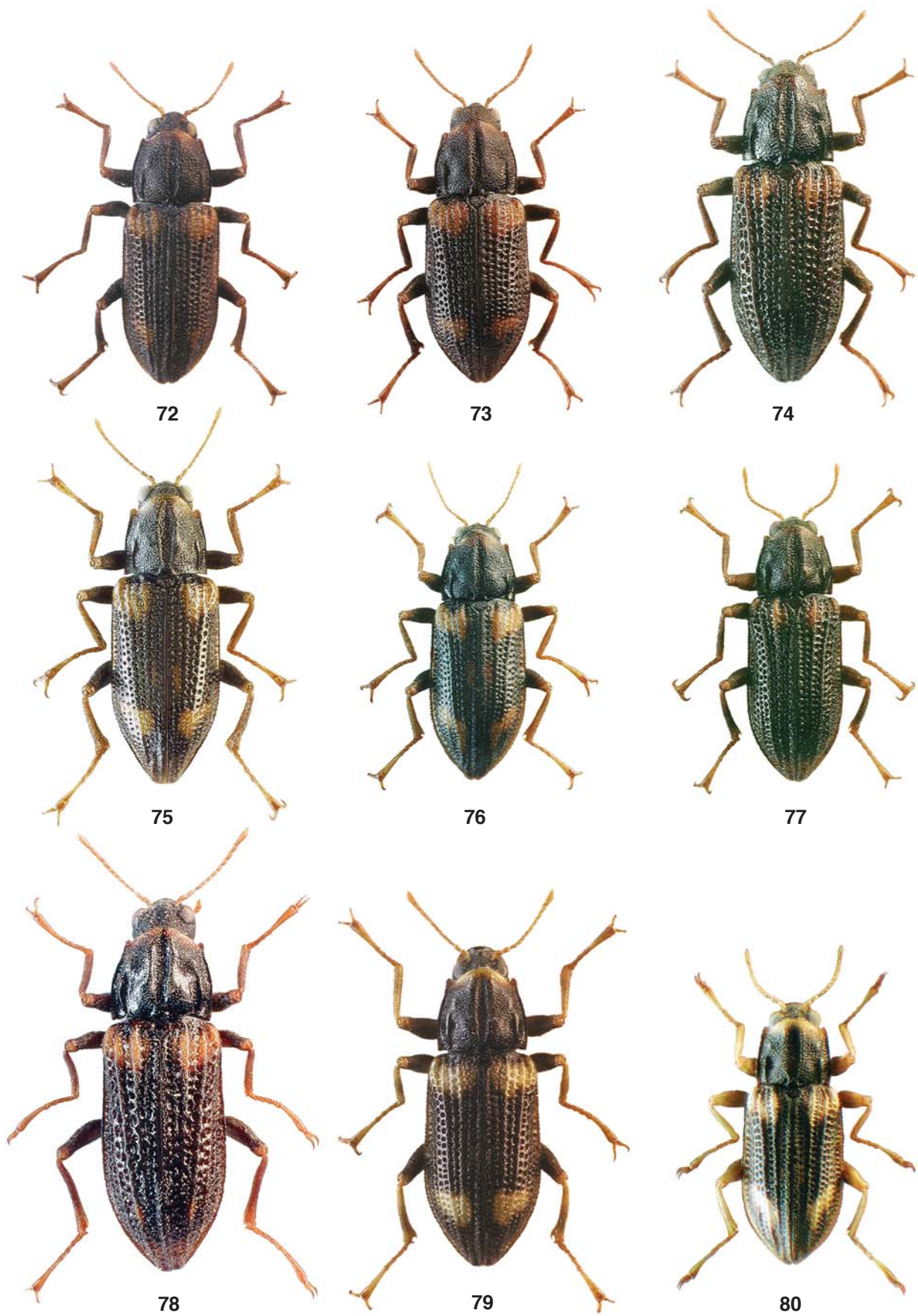
Diagnosis. Within the *G. picta* species group, *G. loebli* sp.nov. differs as follows: 1) frons and vertex plicate-micropunctured; 2) clypeus with long pale setae; 3) pale anterior margin of pronotum narrow; 4) pronotum plicate-microreticulate; 5) anterior sublateral tubercles of pronotum indistinct; 6) posterior sublateral pronotal tubercles feebly raised, not reaching posterior pronotal margin; 7) elytral intervals 3, 5 and 7 slightly raised; 8) elytral marking consists of two prebasal maculae separated mesally by sutural interval and two very indistinct admedian spots in about 0.75; 9) apex of penis distinctly curved in lateral view.

Description. Body form elongate (Fig. 72); CL in ♂♂ (2.50–2.88 mm, $\bar{S}=2.74\pm0.10$), in ♀♀ (2.56–2.88 mm, $\bar{S}=2.78\pm0.09$); EW in ♂♂ (0.97–1.13 mm, $\bar{S}=1.07\pm0.05$), in ♀♀ (0.97–1.13 mm, $\bar{S}=1.07\pm0.04$), CL/EW in ♂♂ (2.49–2.68, $\bar{S}=2.57\pm0.07$), in ♀♀ (2.49–2.73, $\bar{S}=2.60\pm0.08$).

Colour pattern: pronotum black with anterior margin slightly paler, narrow; elytra with yellowish prebasal maculae separated by sutural interval and pair of very indistinct admedian spots in about 0.7.

Head. HW in ♂♂ (0.51–0.56 mm, $\bar{S}=0.54\pm0.02$), in ♀♀ (0.53–0.59 mm, $\bar{S}=0.56\pm0.02$); ID in ♂♂ (0.32–0.35 mm, $\bar{S}=0.33\pm0.01$), in ♀♀ (0.32–0.38 mm, $\bar{S}=0.35\pm0.02$); ED in ♂♂ (0.21–0.25 mm, $\bar{S}=0.23\pm0.02$), in ♀♀ (0.21–0.25 mm, $\bar{S}=0.24\pm0.01$); HW/ID in ♂♂ (1.50–1.73, $\bar{S}=1.62\pm0.06$), in ♀♀ (1.52–1.64, $\bar{S}=1.58\pm0.04$). Labrum with setigerous punctures in anterior half, posterior half glabrous, narrow anterior margin paler. Clypeus as long as labrum, with longer pale setae, raised mesally; surface almost glabrous except of micropunctured postero-lateral portions; fronto-clypeal suture deep; frons depressed between antennae, as well as vertex plicate-microreticulate, with sparse pale setae; eyes large, oval in lateral view and convex in dorsal view, with margins raised on inner side.

Thorax. Pronotum about as wide as long, widest posteriorly of middle; PL in ♂♂ (0.75–0.88 mm, $\bar{S}=0.83\pm0.04$), in ♀♀ (0.81–0.88 mm, $\bar{S}=0.87\pm0.02$); PW in ♂♂ (0.77–0.85 mm, $\bar{S}=0.81\pm0.03$), in ♀♀ (0.77–0.87 mm, $\bar{S}=0.82\pm0.03$); AP in ♂♂ (0.56–0.67 mm, $\bar{S}=0.61\pm0.03$), in ♀♀ (0.59–0.69 mm, $\bar{S}=0.64\pm0.03$); lateral margins explanate; anterior angles produced and almost rounded; anterior sublateral tubercles indistinct; posterior tubercles slightly shorter than half of PL, finely carinate, not reaching posterior margin; median groove large, moderately deeply impressed; lateral margins of groove raised; prebasal admedian pits vestigial; surface

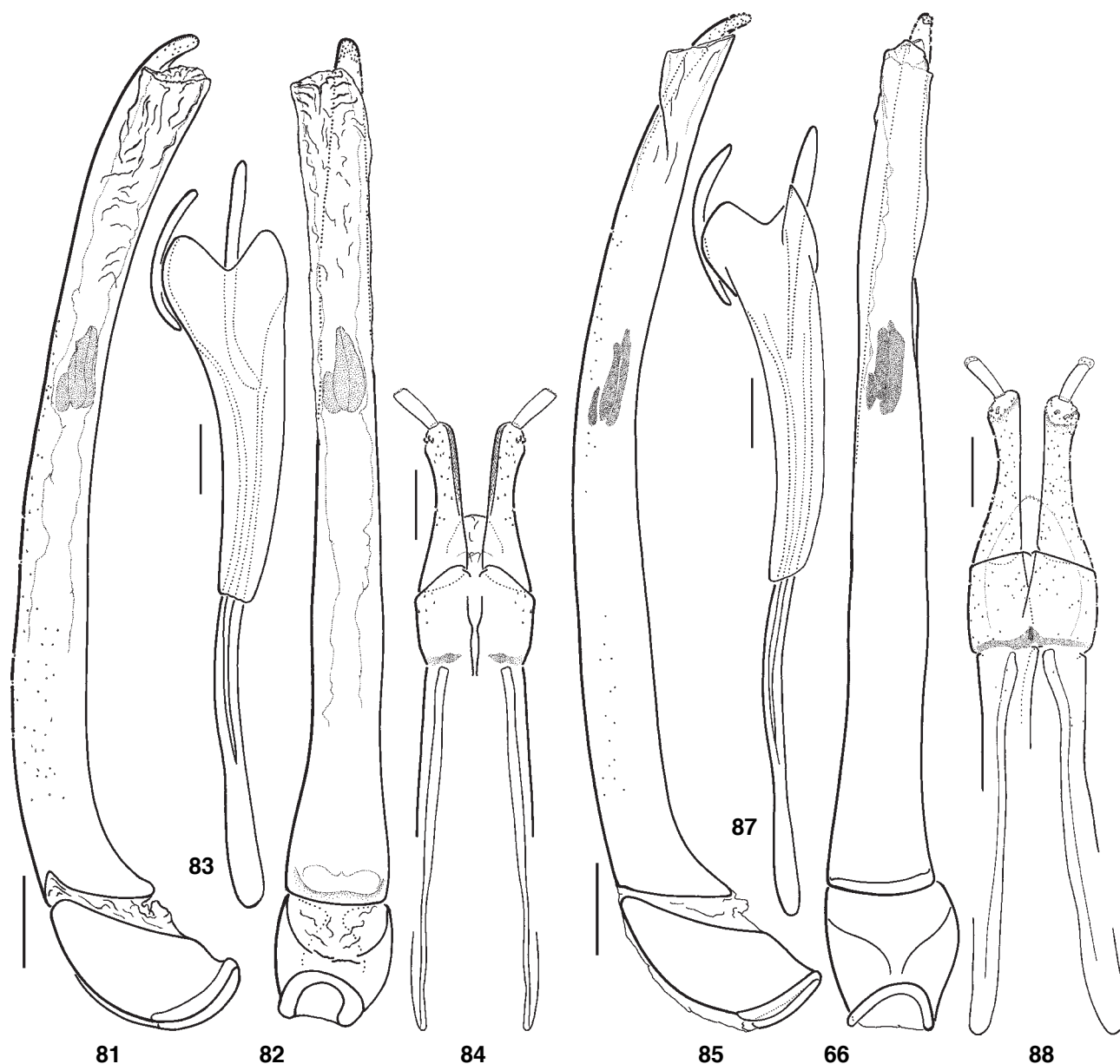


Figs 72–80 Habitus of: 72) *Graphelmis loebli* sp.nov.; 73) *Graphelmis vogleri* sp.nov.; 74) *Graphelmis balkei* sp.nov.; 75) *Graphelmis clava* sp.nov.; 76) *Graphelmis riberai* sp.nov.; 77) *Graphelmis picea* sp.nov.; 78) *Graphelmis verpa* JÄCH; 79) *G. diaphoroderes* JÄCH; 80) *Graphelmis lomata* JÄCH.

plicate-micropunctured, with sparse tiny setae. Prosternum with disc plicate; prosternal process plicate, with lateral margins raised, microreticulate; posterior margin with narrow distinctly projected median protuberance. Scutellum almost rounded, flat, irregularly micropunctured. Mesosternum impressed mesally, without oblique microreticulate carinae; surface plicate-micropunctured. Metasternum about twice as long as mesosternum; disc slightly raised in anterior half and widely, shallowly depressed along longitudinal suture in posterior half; admedian prebasal punctures indistinct; sublateral carinae absent; surface covered by plastron structures except of narrow, finely grooved median portion of disc and anterior margin; disc of males with longer yellowish setae. Elytra parallel-sided in anterior about 0.7, then continuously converging toward apices; EL

in ♂♂ (1.75 – 2.00 mm, $\bar{S} = 1.91 \pm 0.07$), in ♀♀ (1.75 – 2.00 mm, $\bar{S} = 1.91 \pm 0.08$); lateral margins explanate and finely serrate; striae punctures large, deeply impressed; intervals 3, 5 and 7 indistinctly raised; surface rough with sparse short setae. Legs brown to dark brown; femora almost glabrous; tibiae finely micropunctured and grooved; FT in ♂♂ (0.62 – 0.68 mm, $\bar{S} = 0.67 \pm 0.02$), in ♀♀ (0.65 – 0.71 mm, $\bar{S} = 0.67 \pm 0.02$); MT in ♂♂ (0.59 – 0.71 mm, $\bar{S} = 0.65 \pm 0.03$), in ♀♀ (0.62 – 0.68 mm, $\bar{S} = 0.65 \pm 0.02$); apex of male metatibiae (Fig. 156); HT in ♂♂ (0.65 – 0.76 mm, $\bar{S} = 0.72 \pm 0.03$), in ♀♀ (0.68 – 0.76 mm, $\bar{S} = 0.72 \pm 0.02$); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process depressed; mesal portion of



Figs 81–88. 81–84 *Graphelmis loebli* sp.nov.: 81) aedeagus lateral view; 82) aedeagus ventral view; 83) spiculum gastrale and sternite 9; 84) ovipositor; 85–88 *Graphelmis vogleri* sp.nov.: 85) aedeagus lateral view; 86) aedeagus ventral view; 87) spiculum gastrale and sternite 9; 88) ovipositor. Scale bars: 0.1mm.

process and ventrites plicate-micropunctured; lateral portions of process and ventrites covered by plastron structures; apex of ventrite 5 deeply excavated and emarginated mesally, sides of apical emargination more distinctly produced posteriad in males. Sternite 9 and spiculum gastrale (Fig. 83).

Aedeagus (Figs 81, 82). Penis long and slender, in lateral view finely curved; apex arched, base moderately produced ventrad. Penis in ventral view slightly widened toward base, feebly constricted near base; membranous endophallus with two larger and one smaller sclerites; phallobasis short, about 0.24× as long as penis.

Ovipositor (Fig. 84) with terminal segment slender, almost straight; preterminal segment about 3.1× as long as terminal, outer side concave; distal sclerite subquadrate, almost 0.7× as long as preterminal; basal segment about 1.5× as long as preterminal and distal sclerites combined; ventral fulcrum straight.

Sexual dimorphism. Males are distinguished by subapically incised metatibiae with apical spines, longer yellow setae on disc of metasternum and by apical emargination of ventrite 5 more distinctly emarginated.

Distribution. So far known only from Irian Jaya (Indonesia).

Etymology. Named in honour of Ivan Löbl, coleopterist from Genève, Switzerland.

Graphelmis vogleri sp.nov.

(Figs 73, 85–88, 157)

Type locality: IRIAN JAYA: Eme Gebiet Emdoman, 800-1000m ca. 139°55'E 04°14'S

Material examined. Holotype ♂ (NMW): "IRIAN JAYA: 29.9.1993 Eme Gebiet Emdoman, 800-1000m ca. 139°55'E 04°14'S leg. M. Balke (25)". **Paratypes** (NMW, CKB): 14 ♂♂, 8 ♀♀ with the same label as holotype; 3 ♂♂, 3 ♀♀: "IRIAN JAYA: 29.9.1993 Eme Gebiet Emdoman, 750m ca. 139°55'E 04°14'S leg. M. Balke (26)"; 1 ♀: "IRIAN JAYA: 1.10.1993 Eme Gebiet Okloma, 1500m ca. 139°55'E 04°14'S leg. M. Balke (28)"; 1 ♀: "IRIAN JAYA: 24.-26.9.1993 Eipomek Gebiet Eipomek - Diruemna, 140°01'E 04°27'S 1800-2600m leg. M. Balke (21-22)"; 2 ♂♂: "IRIAN JAYA: Paniai Prov. road Nabire - Ilaga, km 140, 4.9.1996, 450m, leg. M. Balke (96♂13)"; (NME): 1 ♂: "INDONESIA Irian Jaya Nabire, S road km 35, Bumi-River 13.I.1996 leg. Weigel"; 1 ♀: "INDONESIA or. Irian Jaya, 110km S Nabire Epomani Nabiro Riv. 05.I.1996 leg. Weigel".

Diagnosis. Within the *G. picta* species group, *G. vogleri* sp.nov. differs as follows: 1) slightly widened body shape (CL/EW about 2.5); 2) raised margin of pronotal median groove equally micropunctured as entire pronotal surface; 3) yellow elytral marking consists of 4 almost rounded spots; 4) posterior elytral yellow spots never postero-medially produced; 5) elytral interval 3 raised anteriorly; 6) elytral intervals 5 and 7 very indistinctly raised; 7) base of penis in lateral view almost acuminate produced; 8) penis in ventral view with sides finely extended in about 0.3.

Description. Body form elongate (Fig. 73); CL in ♂♂

(2.68 – 2.90 mm, \bar{S} = 2.81 ± 0.09), in ♀♀ (2.71 – 2.94 mm, \bar{S} = 2.81 ± 0.08); EW in ♂♂ (1.10 – 1.18 mm, \bar{S} = 1.13 ± 0.03), in ♀♀ (1.07 – 1.12 mm, \bar{S} = 1.10 ± 0.02); CL/EW in ♂♂ (2.43 – 2.59, \bar{S} = 2.49 ± 0.06), in ♀♀ (2.49 – 2.63, \bar{S} = 2.55 ± 0.05).

Colour pattern: pronotum with slightly paler narrow anterior margin; elytra with wider prebasal and narrower subapical spots.

Head. HW in ♂♂ (0.54 – 0.57 mm, \bar{S} = 0.55 ± 0.01), in ♀♀ (0.53 – 0.57 mm, \bar{S} = 0.55 ± 0.02); ID in ♂♂ (0.26 – 0.29 mm, \bar{S} = 0.28 ± 0.01), in ♀♀ (0.28 – 0.31 mm, \bar{S} = 0.29 ± 0.01); ED in ♂♂ (0.24 – 0.26 mm, \bar{S} = 0.24 ± 0.01), in ♀♀ (0.21 – 0.26 mm, \bar{S} = 0.24 ± 0.02); HW/ID in ♂♂ (1.80 – 2.05, \bar{S} = 1.88 ± 0.09), in ♀♀ (1.80 – 2.05, \bar{S} = 1.88 ± 0.09). Labrum micropunctured, punctures with long yellow setae. Clypeus as long as labrum; lateral portions finely microreticulate; mesal portion raised, almost glabrous; surface sparsely setose; fronto-clypeal suture depressed; frons and vertex rough with short tiny setae; eyes large, oval in lateral view and convex in dorsal view, with margins raised.

Thorax. Pronotum slightly wider than long, widest posteriorly of middle; PL in ♂♂ (0.79 – 0.85 mm, \bar{S} = 0.82 ± 0.03), in ♀♀ (0.79 – 0.88 mm, \bar{S} = 0.83 ± 0.04); PW in ♂♂ (0.85 – 0.94 mm, \bar{S} = 0.89 ± 0.03), in ♀♀ (0.84 – 0.90 mm, \bar{S} = 0.87 ± 0.03); AP in ♂♂ (0.63 – 0.68 mm, \bar{S} = 0.65 ± 0.02), in ♀♀ (0.62 – 0.71 mm, \bar{S} = 0.66 ± 0.03); lateral margins explanate; anterior angles produced; anterior sublateral tubercles indistinct; posterior tubercles carinate, not reaching posterior pronotal margin; median groove large, plicate; lateral margins of groove raised; prebasal admedian pits small and shallow; surface densely irregularly micropunctured, with a few tiny, short setae. Prosternum: prosternal process with sides subparallel; lateral margins finely raised, slightly widened posteriad; posterior margin with well projected median protuberance; surface of prosternum plicate. Scutellum subtriangular or almost rounded, flat; surface sparsely irregularly micropunctured. Mesosternum deeply impressed mesally, without oblique microreticulate carinae; surface microreticulate in anterior half, plicate with tiny setae in posterior half. Metasternum about twice as long as mesosternum, almost flat in males and slightly raised anteriorly in females; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture widely depressed in posterior 0.8; lateral portions of disc covered by plastron structures; area between mesocoxae and mesal portion rough; disc of males with sparse flattened yellow setae. Elytra with sides subparallel in anterior two-thirds, then straightly converging toward nearly truncated apices; EL in ♂♂ (1.88 – 2.06 mm, \bar{S} = 1.99 ± 0.06), in ♀♀ (1.90 – 2.06 mm, \bar{S} = 1.98 ± 0.06); lateral margins explanate and serrate; striae punctures well impressed; interval 3 raised anteriorly; entire interval 5 finely raised; interval 7 finely raised in 0.5 – 0.75; elytral surface finely plicate, with a few short setae. Legs: almost entire femora dark; tibiae more or less distinctly microreticulate; FT in ♂♂ (0.68 – 0.71 mm, \bar{S} = 0.69 ± 0.01), in ♀♀ (0.63 – 0.72 mm, \bar{S} = 0.67 ± 0.03); MT in ♂♂ (0.65 – 0.71 mm, \bar{S} = 0.68 ± 0.03),

in ♀♀ (0.63 – 0.65 mm, \bar{S} = 0.64 ± 0.01); metatibiae of males (Fig. 157); HT in ♂♂ (0.74 – 0.79 mm, \bar{S} = 0.77 ± 0.02), in ♀♀ (0.68 – 0.76 mm, \bar{S} = 0.73 ± 0.03); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process flat; anterior portion of process rough; mesal portion of disc of ventrites rough or densely irregularly micropunctured; lateral portions of ventrites covered by plastron structures; apex of ventrite 5 rough, emarginate, sides of apical emargination distinctly produced posteriad. Sternite 9 and spiculum gastrale (Fig. 87).

Aedeagus (Figs 85, 86). Penis long; in lateral view finely curved, with base almost acuminate produced ventrad; in ventral view almost straight, with sides finely extended in about 0.3; membranous endophallus with three sclerites; phallobasis short, about 0.22× as long as penis.

Ovipositor (Fig. 88) with terminal segment slender and almost straight; preterminal segment about 3.6× as long as terminal, outer side concave; distal sclerite subquadrate, about 0.58× as long as preterminal; basal segment about 1.54× as long as preterminal and distal sclerites combined; ventral fulcrum finely sinuate in apical portion then almost straight.

Sexual dimorphism. Males are distinguished by metatibial apices widened and incised, yellow setae on disc of metasternum and apex of ventrite 5 distinctly emarginate.

Distribution. So far known only from Irian Jaya (Indonesia).

Etymology. Named for friend, expert in beetle molecular biology and phylogeny, Alfried Vogler from London.

Graphelmis balkei sp.nov.

(Figs 74, 89–92, 158)

Type locality: IRIAN JAYA: Eme Gebiet Emdoman, 800–1000m ca. 139°55'E 04°14'S

Material examined. Holotype ♂ (NMW): "IRIAN JAYA: 29.9.1993 Eme Gebiet Emdoman, 800–1000m ca. 139°55'E 04°14'S leg. M. Balke (25)". **Paratypes** (NMW, CKB): 1 ♀ with the same label as holotype; 14 ♂♂, 13 ♀♀: "PAPUA N.G.: Sanduan Prov. Telefomin, 16.-17.5.1998 trail to Eliptamin 1700–1800m; leg. Riedel"; 1 ♂, 2 ♀♀: "IRIAN JAYA: Zentralmassiv. 140°25'E 04°24'S 12./18.1.1992 Borne, 1000m leg. Balke (7)"; 4 ♂♂, 7 ♀♀: "IRIAN JAYA: 22.9.1993 Bime - Calab Gebiet Bime, 1400m ca. 140°12'E 04°20'S leg. M. Balke (17)"; 4 ♂♂, 6 ♀♀: "IRIAN JAYA: 24.-26.9.1993 Eipomek Gebiet Eipomek - Diruemna, 140°01'E 04°27'S 1800–2600m leg. M. Balke (21-22)"; 2 ♂♂, 2 ♀♀: "IRIAN JAYA: 29.9.1993 Eme Gebiet Emdoman, 750m ca. 139°55'E 04°14'S leg. M. Balke (26)"; 3 ♂♂, 5 ♀♀: "IRIAN JAYA: 1.10.1993 Eme Gebiet Okloma, 1500m ca. 139°55'E 04°14'S leg. M. Balke (28)".

Diagnosis. Within the *G. picta* species group, *G. balkei* sp.nov. differs as follows: 1) median pronotal groove distinctly plicate; 2) pronotum except of slightly paler anterior margin black; 3) elytral colour pattern reduced to indistinct prebasal spots; 4) elytral apices truncate; 5) male

metatibiae slightly widened preapically with inconspicuous apical spine; 6) elytral punctures extremely deeply impressed; 7) mesosternum plicate-microreticulate; 8) aedeagus large, with base distinctly produced ventrad (lateral view).

Description. Body form elongate (Fig. 74); CL in ♂♂ (3.15 – 3.32 mm, \bar{S} = 3.23 ± 0.06), in ♀♀ (3.15 – 3.50 mm, \bar{S} = 3.27 ± 0.14); EW in ♂♂ (1.19 – 1.32 mm, \bar{S} = 1.23 ± 0.05), in ♀♀ (1.15 – 1.35 mm, \bar{S} = 1.24 ± 0.07), CL/EW in ♂♂ (2.51 – 2.66, \bar{S} = 2.62 ± 0.06), in ♀♀ (2.59 – 2.74, \bar{S} = 2.65 ± 0.06).

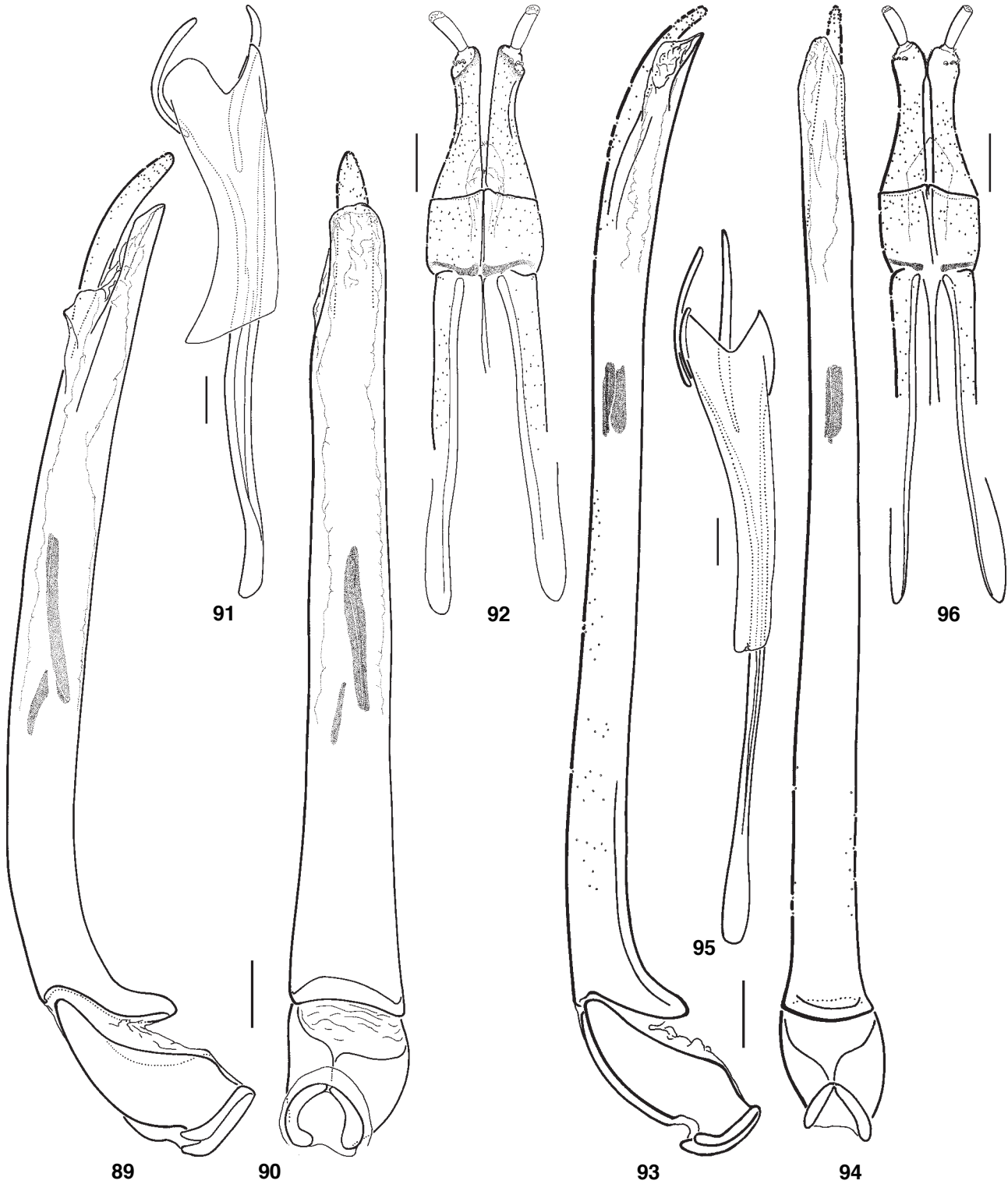
Colour pattern: pronotum black with slightly paler anterior margin; elytra with more or less distinct small, yellowish or reddish prebasal spots (sometimes fused).

Head. HW in ♂♂ (0.56 – 0.62 mm, \bar{S} = 0.60 ± 0.02), in ♀♀ (0.60 – 0.66 mm, \bar{S} = 0.63 ± 0.02); ID in ♂♂ (0.32 – 0.35 mm, \bar{S} = 0.34 ± 0.01), in ♀♀ (0.35 – 0.38 mm, \bar{S} = 0.37 ± 0.01); ED in ♂♂ (0.24 – 0.26 mm, \bar{S} = 0.25 ± 0.02), in ♀♀ (0.24 – 0.28 mm, \bar{S} = 0.26 ± 0.02); HW/ID in ♂♂ (1.73 – 1.83, \bar{S} = 1.78 ± 0.04), in ♀♀ (1.68 – 1.76, \bar{S} = 1.71 ± 0.03). Labrum with setigerous punctures in anterior half, posterior half glabrous, anterior margin paler; clypeus as long as labrum, rough, with raised mesal portion; frontoclypeal suture depressed; frons depressed between antennae as well as vertex rough with short tiny setae; eyes moderately large, oval in lateral view and convex in dorsal view, with more or less raised margins on inner side.

Thorax. Pronotum slightly wider than long, widest posteriorly of middle; PL in ♂♂ (0.85 – 0.94 mm, \bar{S} = 0.90 ± 0.03), in ♀♀ (0.88 – 0.97 mm, \bar{S} = 0.93 ± 0.04); PW in ♂♂ (0.93 – 1.00 mm, \bar{S} = 0.97 ± 0.03), in ♀♀ (0.97 – 1.06 mm, \bar{S} = 1.00 ± 0.04); AP in ♂♂ (0.68 – 0.74 mm, \bar{S} = 0.71 ± 0.03), in ♀♀ (0.74 – 0.78 mm, \bar{S} = 0.75 ± 0.02); lateral margins explanate; anterior angles produced and rounded; anterior sublateral tubercles rounded; posterior tubercles almost half as long as PL, carinate, reaching posterior pronotal margin; median groove large and deep; lateral margins of groove raised; prebasal admedian pits vestigial; surface densely irregularly micropunctured, with sparse tiny setae; punctures sparser on margins of groove, tubercles and on pronotal margins; interstices shiny. Prosternum with disc glabrous in anterior half and plicate in posterior half; prosternal process plicate, with lateral margins raised, microreticulate; posterior margin with narrow, distinctly projected median protuberance. Scutellum almost rounded, flat; surface glabrous. Mesosternum deeply impressed mesally, without oblique microreticulate carinae; surface plicate except of small microreticulate anterior admedian portions. Metasternum about twice as long as mesosternum; disc slightly raised in anterior half and depressed along longitudinal suture in posterior half; admedian prebasal punctures transverse; sublateral carinae absent; surface covered by plastron structures except of narrow, finely grooved median portion; disc of males with longer yellowish setae. Elytra parallel-sided in anterior 0.7, then almost straightly converging toward narrowly truncated apices; EL in ♂♂ (2.26 – 2.41 mm, \bar{S} = 2.33 ± 0.05), in ♀♀ (2.24 – 2.53 mm, \bar{S} = 2.34 ± 0.10); lateral margins

explanate and finely serrate; strial punctures large, deeply impressed; intervals 3, 5 and 7 slightly raised; intervals and interstices glabrous with sparse short setae. Legs brown to dark brown; femora almost glabrous; tibiae finely micropunctured and grooved; FT in ♂♂ (0.74–0.82 mm, $\bar{S}=0.78 \pm 0.03$), in ♀♀ (0.76–0.85 mm, $\bar{S}=0.80 \pm 0.03$);

MT in ♂♂ (0.74–0.79 mm, $\bar{S}=0.76 \pm 0.02$), in ♀♀ (0.74–0.82 mm, $\bar{S}=0.76 \pm 0.04$); metatibiae of males widened preapically, with inconspicuous acuminate apical spine (Fig. 158); HT in ♂♂ (0.82–0.91 mm, $\bar{S}=0.87 \pm 0.03$), in ♀♀ (0.82–0.91 mm, $\bar{S}=0.87 \pm 0.03$); length of tarsomere 5 equal to combined length of tarsomeres 1–4.



Figs 89–96. 89–92 *Graphelmis balkei* sp.nov.: 89) aedeagus lateral view; 90) aedeagus ventral view; 91) spiculum gastrale and sternite 9; 92) ovipositor; 93–96 *Graphelmis clava* sp.nov.: 93) aedeagus lateral view; 94) aedeagus ventral view; 95) spiculum gastrale and sternite 9; 96) ovipositor. Scale bars: 0.1mm.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process depressed; mesal portion of process and disc of ventrites densely irregularly micropunctured; lateral portions of process and ventrites covered by plastron structures; apex of ventrite 5 deeply mesally emarginate, with sides of apical emargination distinctly produced posteriad. Sternite 9 and spiculum gastrale (Fig. 91).

Aedeagus (Figs 89, 90). Penis long and slender, in lateral view curved apically and basally with base distinctly produced ventrad; penis in ventral view parallel-sided; membranous endophallus with two long and one shorter sclerites; phallobasis short, about 0.26× as long as penis.

Ovipositor (Fig. 92) with terminal segment slender, almost straight; preterminal segment about 3.4× as long as terminal, outer side concave; distal sclerite subquadrate, almost 0.6× as long as preterminal; basal segment about 1.46× as long as preterminal and distal sclerites combined; ventral fulcrum straight.

Sexual dimorphism. Males are distinguished by widened metatibial apices with apical spines, yellow setae on disc of metasternum and by more produced sides of apical emargination of ventrite 5.

Distribution. So far known only from Irian Jaya (Indonesia).

Etymology. Named for friend and coleopterist Michael Balke.

Graphelmis clava sp.nov.

(Figs 75, 93–96, 159)

Type locality: IRIAN JAYA: Eme Gebiet Emdoman, 750m ca. 139°55'E 04°14'S.

Material examined. Holotype ♂ (NMW): "IRIAN JAYA: 29.9.1993 Eme Gebiet Emdoman, 750m ca. 139°55'E 04°14'S leg. M. Balke (26)" **Paratypes** (NMW, CKB): 4♂♂, 4♀♀ with the same label as holotype; 2♂♂: "IRIAN JAYA: 29.9.1993 Eme Gebiet Emdoman, 800-1000m ca. 139°55'E 04°14'S leg. M. Balke (25)".

Diagnosis. Within the *G. picta* species group, *G. clava* sp.nov. differs as follows: 1) elytral apices narrowly truncate; 2) pronotal median groove plicate; 3) distal end of male metatibiae extremely widened, excavation indistinct, apical spine small; 4) penis long and slender, in lateral view finely sinuate.

Description. Body form elongate (Fig. 75); CL in ♂♂ (3.00 – 3.23 mm, \bar{S} = 3.15 ± 0.09), in ♀♀ (3.26 – 3.36 mm); EW in ♂♂ (1.15 – 1.26 mm, \bar{S} = 1.21 ± 0.04), in ♀♀ (1.18 – 1.26 mm), CL/EW in ♂♂ (2.55 – 2.66, \bar{S} = 2.61 ± 0.04), in ♀♀ (2.64 – 2.81).

Colour pattern: pronotum with slightly paler anterior margin; elytra with oblique prebasal spots and pair of irregular subapical spots.

Head. HW in ♂♂ (0.56 – 0.65 mm, \bar{S} = 0.60 ± 0.03), in ♀♀ (0.62 – 0.65 mm); ID in ♂♂ (0.28 – 0.35 mm, \bar{S} = 0.31 ± 0.03), in ♀♀ (0.31 – 0.32 mm); ED in ♂♂ 0.26 mm, in ♀♀ (0.28 – 0.29 mm); HW/ID in ♂♂ (1.83 – 2.10, \bar{S} = 1.96 ± 0.10), in ♀♀ (2.00 – 2.10). Labrum with ante-

rior margin paler; surface of posterior half glabrous, anterior half with long yellow setae; clypeus shorter than labrum, raised mesally, rough; fronto-clypeal suture depressed; frons and vertex rough with short tiny setae; eyes very large, oval in lateral view and distinctly convex in dorsal view, with margins raised.

Thorax. Pronotum black except paler anterior margin, about as wide as long, widest in about middle or in basal third; PL in ♂♂ (0.85 – 0.97 mm, \bar{S} = 0.91 ± 0.05), in ♀♀ (0.95 – 0.97 mm); PW in ♂♂ (0.84 – 1.00 mm, \bar{S} = 0.91 ± 0.07), in ♀♀ (0.91 – 1.00 mm); AP in ♂♂ (2.81 – 3.50 mm, \bar{S} = 3.13 ± 0.21), in ♀♀ (0.72 – 0.75 mm); lateral margins explanate; anterior angles produced and rounded; anterior sublateral tubercles weak; posterior tubercles long (about half as long as PL), carinate, reaching posterior margin; median groove large, shallowly impressed, plicate; lateral margins of groove slightly raised; prebasal admedian pits small, feebly depressed; surface densely irregularly micropunctured, with a few tiny setae; punctures sparse on borders of groove and tubercles. Prosternum: prosternal process with lateral margins raised, microreticulate; posterior margin with wide median protuberance; surface of prosternum plicate. Scutellum almost rounded, flat; surface shiny or shallowly sparsely micropunctured. Mesosternum deeply impressed mesally, without oblique microreticulate carinae; surface microreticulate in anterior half, posterior half plicate. Metasternum about twice as long as mesosternum; sides of disc somewhat convex in cross-section; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture distinctly depressed in posterior 0.75; most of disc covered by plastron structures; anterior 0.25 and mesal portion along median suture rough; disc of males with sparse yellow setose. Elytra with sides parallel or slightly narrowed in anterior two-thirds, then straightly converging toward narrowly truncated apices; EL in ♂♂ (2.15 – 2.31 mm, \bar{S} = 2.24 ± 0.06), in ♀♀ (2.31 – 2.38 mm); lateral margins explanate and finely serrate; striae punctures more impressed in middle third of disc and on sides; interval 5 slightly raised in posterior third; elytral surface rough with sparse short setae. Legs: femora except distal ends black; surface microreticulate with pale setae; tibiae paler; surface microreticulate or rough with the same kind of setae as on femora; FT in ♂♂ (0.79 – 0.94 mm, \bar{S} = 0.85 ± 0.06), in ♀♀ 0.88 mm; MT in ♂♂ (0.79 – 0.91 mm, \bar{S} = 0.81 ± 0.04), in ♀♀ (0.85 – 0.88 mm); metatibiae of males subapically abruptly widened, feebly excavate; apical spine small, acuminate (Fig. 159); female metatibiae only slightly widened subapically; HT in ♂♂ (0.88 – 1.00 mm, \bar{S} = 0.93 ± 0.04), in ♀♀ (0.91 – 0.94 mm); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process depressed; apex of process rough, disc of ventrites microreticulate; lateral portions of ventrites covered by plastron structures; apex of ventrite 5 rough, sides of apical emargination produced posteriad (more distinctly in males). Sternite 9 and spiculum gastrale (Fig. 95).

Aedeagus (Figs 93, 94). Penis long and slender; in

lateral view finely curved apically with base distinctly produced ventrad; in ventral view straight, with sides subparallel; basally slightly widened; membranous endophallus with three short sclerites; phallobasis short, about 0.2× as long as penis.

Ovipositor (Fig. 96) with terminal segment slender and slightly curved; preterminal segment about 3.6× as long as terminal, outer side concave; distal sclerite subquadrate, almost 0.6× as long as preterminal; basal segment about 1.45× as long as preterminal and distal sclerites combined; ventral fulcrum straight.

Sexual dimorphism. Males are distinguished by distinctly widened metatibial apices, yellow setae on disc of metasternum and by more produced sides of apical emargination of ventrite 5.

Distribution. So far known only from Irian Jaya (Indonesia).

Etymology: from Latin *clava* – club in reference to the apically widened male metatibiae.

Graphelmis riberai sp.nov.

(Figs 76, 97–100, 160)

Type locality: IRIAN JAYA: Nabire Prov., Nabire - Ilaga, km 100 Kali Utowa

Material examined. Holotype ♂ (NMW): “IRIAN JAYA: Nabire Prov., Nabire - Ilaga, km 100 Kali Utowa, 8.10.1997, leg. M. Balke (♂10)”. **Paratypes** (NMW, CKB): 4♂♂, 5♀♀ with the same label as holotype; 1♀: “IRIAN JAYA: Nabire Prov., Nabire - Ilaga, km 35 Kali Cemara, 23.10.1997, leg. M. Balke (♂13)”; 1♂, 1♀: “IRIAN JAYA: Kabup. Nabire, 30km S Nabire, Kali Cemara 150m, 15.8.1997, leg. M. Balke (CEMLux)”; 2♂♂, 5♀♀: “IRIAN JAYA: Paniai Prov. Road Nabire - Ilaga, km 38, 18.9.1996, 200m, leg. M. Balke (96♂25)”; 3♂♂, 3♀♀: “IRIAN JAYA: Paniai Prov. Road Nabire - Ilaga, km 30 Pemukiman, 26.8.1996, 200m, leg. M. Balke (96♂3)”; 1♀: “IRIAN JAYA: 29.9.1993 Eme Gebiet, Emdoman, 800-1000m, ca. 139°55'E 04°14'S, leg. M. Balke (25)”.

Diagnosis. Within the *G. picta* species group, *G. riberai* sp.nov. differs as follows: 1) anterior admedian punctures of pronotum fine; 2) posterior pronotal angles shiny; 3) entire elytral interval 5 finely raised; 4) elytral interval 7 finely raised in apical 0.5 – 0.75; 5) penis long, in lateral view finely almost straight, in ventral view curved; 6) almost entire femora black; 7) prosternal process plicate.

Description. Body form elongate (Fig. 76); CL in ♂♂ (2.69 – 2.79 mm, \bar{S} = 2.74 ± 0.04), in ♀♀ (2.53 – 2.79 mm, \bar{S} = 2.65 ± 0.10); EW in ♂♂ (1.07 – 1.18 mm, \bar{S} = 1.13 ± 0.04), in ♀♀ (0.97 – 1.09 mm, \bar{S} = 1.04 ± 0.05); CL/EW in ♂♂ (2.35 – 2.51, \bar{S} = 2.44 ± 0.06), in ♀♀ (2.41 – 2.64, \bar{S} = 2.54 ± 0.08).

Colour pattern: pronotum with slightly paler anterior margin (widened mesally); elytra with mesally widely separated yellowish prebasal spots, pair of more or less distinctly yellow admedian spots in middle and pair of oblique subapical spots.

Head. HW in ♂♂ (0.50 – 0.59 mm, \bar{S} = 0.54 ± 0.03), in ♀♀ (0.49 – 0.59 mm, \bar{S} = 0.55 ± 0.04); ID in ♂♂ (0.26

– 0.31 mm, \bar{S} = 0.28 ± 0.02), in ♀♀ (0.25 – 0.28 mm, \bar{S} = 0.27 ± 0.01); ED in ♂♂ (0.21 – 0.25 mm, \bar{S} = 0.23 ± 0.02), in ♀♀ (0.21 – 0.25 mm, \bar{S} = 0.23 ± 0.02); HW/ID in ♂♂ (1.85 – 2.11, \bar{S} = 1.95 ± 0.09), in ♀♀ (1.89 – 2.22, \bar{S} = 2.05 ± 0.12). Labrum with anterior margin paler; surface micropunctured; punctures with long yellow setae; clypeus as long as labrum, raised mesally, rough; fronto-clypeal suture depressed; frons and vertex rough with short tiny setae; eyes large, oval in lateral view and convex in dorsal view, with margins raised.

Thorax. Pronotum slightly wider than long, widest in about basal third; PL in ♂♂ (0.75 – 0.85 mm, \bar{S} = 0.80 ± 0.03), in ♀♀ (0.74 – 0.79 mm, \bar{S} = 0.77 ± 0.02); PW in ♂♂ (0.84 – 0.91 mm, \bar{S} = 0.88 ± 0.02), in ♀♀ (0.76 – 0.85 mm, \bar{S} = 0.83 ± 0.04); AP in ♂♂ (0.62 – 0.68 mm, \bar{S} = 0.64 ± 0.02), in ♀♀ (0.59 – 0.65 mm, \bar{S} = 0.62 ± 0.02); lateral margins explanate; anterior angles produced; posterior angles shiny; anterior sublateral tubercles indistinct; posterior tubercles less than half as long as PL, carinate, reaching posterior pronotal margin; median groove large; lateral margins of groove feebly raised; prebasal admedian pits inconspicuous; surface densely irregularly micropunctured; tubercles with a few tiny, short setae; basal angles shiny. Prosternum: prosternal process with sides subparallel; lateral margins almost flat; posterior margin with well developed median protuberance; surface of prosternum plicate; middle of process with a few micropunctures. Scutellum subtriangular, flat; surface micropunctured; anterior margin glabrous. Mesosternum deeply impressed mesally, without oblique microreticulate carinae; surface microreticulate in anterior half, posterior half plicate. Metasternum about twice as long as mesosternum; anterior third more or less raised mesally; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture deeply depressed in posterior 0.75; lateral portions of disc covered by plastron structures; area between mesocoxae and mesal portion densely micropunctured; disc of males with sparse longer yellow setae. Elytra with sides subparallel in anterior two-thirds, then straightly converging toward nearly acuminate apices; EL in ♂♂ (1.91 – 1.97 mm, \bar{S} = 1.94 ± 0.02), in ♀♀ (1.76 – 2.00 mm, \bar{S} = 1.87 ± 0.08); lateral margins explanate and serrate; strial punctures moderately deeply impressed; interval 3 raised anteriorly; entire interval 5 finely raised; interval 7 finely raised in 0.5 – 0.75; elytral surface finely rough, with a few short setae. Legs: almost entire femora dark; FT in ♂♂ (0.65 – 0.74 mm, \bar{S} = 0.69 ± 0.03), in ♀♀ (0.62 – 0.71 mm, \bar{S} = 0.65 ± 0.03); MT in ♂♂ (0.65 – 0.71 mm, \bar{S} = 0.68 ± 0.03), in ♀♀ (0.59 – 0.68 mm, \bar{S} = 0.62 ± 0.04); metatibiae of males (Fig. 160); HT in ♂♂ (0.71 – 0.76 mm, \bar{S} = 0.74 ± 0.03), in ♀♀ (0.65 – 0.75 mm, \bar{S} = 0.70 ± 0.04); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process finely depressed; anterior portion of process rough; mesal portion of disc of ventrites densely micropunctured; admedian and lateral portions of ventrites covered by plastron structures; apex of ventrite 5 rough, emarginate, sides of apical emargination distinctly

produced posteriad. Sternite 9 and spiculum gastrale (Fig. 99).

Aedeagus (Figs 97, 98). Penis long; in lateral view finely curved subapically and anteriorly with base distinctly produced ventrad; in ventral view curved with base somewhat widened; membranous endophallus with three sclerites; phallobasis short, about 0.23× as long as penis.

Ovipositor (Fig. 100) with terminal segment slender and slightly curved; preterminal segment about 3.6× as long as terminal, outer side concave; distal sclerite subquadrate, almost 0.65× as long as preterminal; basal segment about 1.47× as long as preterminal and distal sclerites combined; ventral fulcrum finely curved.

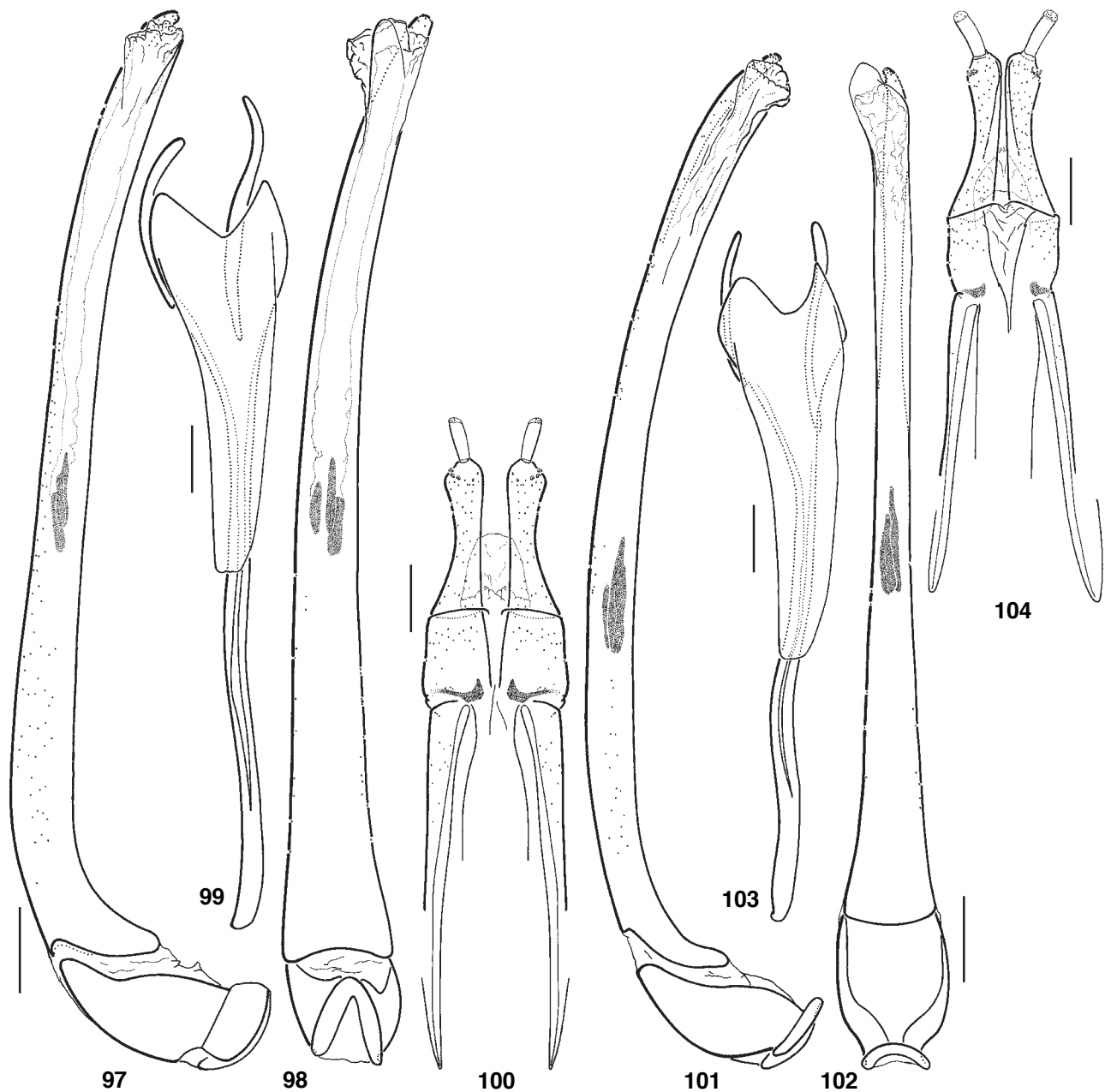
Sexual dimorphism. Males are distinguished by widened and incised metatibial apices and yellow setae on disc of metasternum.

Distribution. So far known only from Irian Jaya (Indonesia).

Etymology. Named for friend, coleopterist Ignacio Ribera.

***Graphelmis picea* sp.nov.**
(Figs 77, 101–104, 161)

Type locality: IRIAN JAYA: Paniai Prov. road Nabire – Ilaga, km 54, 750–800m.



Figs 97–104. 97–100 *G. riberae* sp.nov.: 97) aedeagus lateral view; 98) aedeagus ventral view; 99) spiculum gastrale and sternite 9; 100) ovipositor; 101–104 *G. picea* sp.nov.: 101) aedeagus lateral view; 102) aedeagus ventral view; 103) spiculum gastrale and sternite 9; 104) ovipositor. Scale bars: 0.1mm.

Material examined. **Holotype** ♂ (NMW): "IRIAN JAYA: Paniai Prov. road Nabire – Ilaga, km 54, 8.9.1996, 750-800m leg. M. Balke (96 ♂ 18)". **Paratypes** (NMW, CKB): 39♂♂, 22♀♀ with the same label as holotype; 2♀♀: "IRIAN JAYA: Paniai Prov. road Nabire – Ilaga, km 54, 30.8.1996, 750 leg. M. Balke (96 ♂ 9)"; 1♂, 2♀♀: "IRIAN JAYA: Paniai Prov. road Nabire – Ilaga, km 53, 17.9.1996, 700m leg. M. Balke (96 ♂ 23)"; 1♂, 1♀♀: "IRIAN JAYA: 28.9.1993 Eme Gebiet Emdoman, 1150m ca. 139°55'E 04°14'S leg. M. Balke (23); 4♂♂, 7♀♀: "IRIAN JAYA: Paniai Prov. road Nabire – Ilaga, km 54, 26./27.8.1996, 750-800m leg. M. Balke (96 ♂ 2)".

Diagnosis. Within the *G. picta* species group, *G. picea* sp.nov. differs as follows: 1) raised lateral margins of pronotal median groove slightly tuberculate anteriorly; 2) elytral marking usually dark, reduced to four (indistinct in some specimens) prebasal spots; 3) scutellum shiny; 4) posterior margin of metasternum with median projection; 5) apex of abdominal intercoxal process distinctly depressed; 6) penis in lateral view long, narrow, with base distinctly produced ventrad.

Description. Body form elongate (Fig. 77); CL in ♂♂ (2.59 – 2.84 mm, \bar{S} = 2.73 ± 0.09), in ♀♀ (2.66 – 2.85 mm, \bar{S} = 2.75 ± 0.07); EW in ♂♂ (1.00 – 1.06 mm, \bar{S} = 1.03 ± 0.02), in ♀♀ (1.00 – 1.06 mm, \bar{S} = 1.03 ± 0.03); CL/EW in ♂♂ (2.59 – 2.70, \bar{S} = 2.65 ± 0.04), in ♀♀ (2.57 – 2.85, \bar{S} = 2.67 ± 0.10).

Colour pattern: pronotum with indistinctly paler anterior margin; elytra with small humeral and prebasal admedian yellowish spots.

Head. HW in ♂♂ (0.53 – 0.56 mm, \bar{S} = 0.54 ± 0.01), in ♀♀ (0.53 – 0.57 mm, \bar{S} = 0.55 ± 0.02); ID in ♂♂ (0.26 – 0.29 mm, \bar{S} = 0.27 ± 0.01), in ♀♀ (0.26 – 0.29 mm, \bar{S} = 0.28 ± 0.01); ED in ♂♂ (0.21 – 0.25 mm, \bar{S} = 0.23 ± 0.02), in ♀♀ (0.22 – 0.24 mm, \bar{S} = 0.23 ± 0.01); HW/ID in ♂♂ (1.89 – 2.06, \bar{S} = 1.98 ± 0.07), in ♀♀ (1.80 – 2.00, \bar{S} = 1.94 ± 0.07). Labrum with anterior margin paler; clypeus as long as labrum, raised mesally; surface of clypeus and labrum sparsely micropunctured, punctures with long yellow setae; fronto-clypeal suture depressed; frons and vertex rough with short tiny setae; eyes large, oval in lateral view, convex in dorsal view, with margins raised.

Thorax. Pronotum slightly wider than long, widest in about basal third; PL in ♂♂ (0.76 – 0.81 mm, \bar{S} = 0.78 ± 0.02), in ♀♀ (0.74 – 0.82 mm, \bar{S} = 0.78 ± 0.03); PW in ♂♂ (0.81 – 0.88 mm, \bar{S} = 0.84 ± 0.02), in ♀♀ (0.82 – 0.88 mm, \bar{S} = 0.85 ± 0.02); AP in ♂♂ (0.60 – 0.65 mm, \bar{S} = 0.62 ± 0.02), in ♀♀ (0.62 – 0.66 mm, \bar{S} = 0.63 ± 0.02); lateral margins explanate; anterior angles produced; anterior sublateral tubercles indistinct; posterior tubercles about 0.3× as long as PL, carinate, reaching posterior margin; median groove large; lateral margins of groove raised; prebasal admedian pits distinct; surface densely irregularly micropunctured, with sparse long yellow setae; punctures more sparse on margins of groove, on tubercles and on anterior margin; prebasal area shiny. Prosternum: prosternal process with sides convergent in anterior half, then sub-

parallel; lateral margins feebly raised, microreticulate; posterior margin with well projected narrow median protuberance; surface of prosternum plicate. Scutellum almost rounded, flat; surface shiny. Mesosternum deeply impressed mesally, without oblique microreticulate carinae; surface microreticulate in anterior half, posterior half plicate. Metasternum about twice as long as mesosternum, flat or finely depressed anteriorly; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture narrowly and shallowly depressed in 0.25 – 0.75; posterior margin of metasternum mesally projected; lateral portions of disc covered by plastron structures; area between mesocoxae and mesal portion rough; disc and lateral portions of metasternum with sparse somewhat flattened yellow setae; disc of males with a few long tiny setae. Elytra with sides parallel in anterior two-thirds, then continuously converging toward nearly truncated apices; EL in ♂♂ (1.82 – 2.03 mm, \bar{S} = 1.95 ± 0.08), in ♀♀ (1.90 – 2.03 mm, \bar{S} = 1.97 ± 0.06); lateral margins explanate and serrate; striae punctures large, deeply impressed; interval 3 raised anteriorly; entire interval 5 finely raised; interval 7 very feebly raised in posterior half; elytral surface almost shiny, with short yellow setae. Legs microreticulate; FT in ♂♂ (0.68 – 0.74 mm, \bar{S} = 0.71 ± 0.02), in ♀♀ (0.68 – 0.71 mm, \bar{S} = 0.69 ± 0.01); MT in ♂♂ (0.68 – 0.72 mm, \bar{S} = 0.70 ± 0.02), in ♀♀ (0.65 – 0.69 mm, \bar{S} = 0.67 ± 0.02); metatibiae of males (Fig. 161); HT in ♂♂ (0.76 – 0.81 mm, \bar{S} = 0.78 ± 0.02), in ♀♀ (0.74 – 0.76 mm, \bar{S} = 0.75 ± 0.01); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process distinctly depressed; anterior portion of process plicate; disc of process densely micropunctured; discs of ventrites 1–2 finely micropunctured or as well as discs of remaining ventrites glabrous and shiny; admedian and lateral portions of ventrites covered by plastron structures; apex of ventrite 5 punctured, but shiny, sides of apical emargination distinctly produced posteriad. Sternite 9 and spiculum gastrale (Fig. 103).

Aedeagus (Figs 101, 102). Penis long and very slender; in lateral view curved with base distinctly produced ventrad; in ventral view straight; base slightly widened; membranous endophallus with three sclerites; phallobasis short, about 0.2× as long as penis.

Ovipositor (Fig. 104) with terminal segment slender and slightly curved; preterminal segment about 4.1× as long as terminal, outer side concave; distal sclerite with anterolateral angles somewhat produced, about half as long as preterminal; basal segment about 1.24× as long as preterminal and distal sclerites combined; ventral fulcrum straight.

Sexual dimorphism. Males are distinguished by widened and excavated metatibial apices and yellow setae on disc of metasternum. Apical setae of ventrite 5 are distinctly longer in males.

Distribution. So far known only from Irian Jaya (Indonesia).

Etymology: from Latin *piceus* – in reference to dark, pitch colour.

Graphelmis verpa JÄCH, 1985

(Figs 78, 162)

Graphelmis verpa JÄCH, 1985: 239-240, Fig. 12

Type locality: PNG/EH Prov. Umg. Iqipinti Korindaiop.

Material examined. Paratypes (NMW): 2♂♂, 1♀: "18.VI. 79 PNG/EHProv. Umg. Iqipinti Korindaiop. R."; 4♂♂: "18.VI. 79 PNG/EHProv. Umg. Ofafina Jababari Riv.". **Additional material** (NMW, CKB): 1♂, 3♀♀: "PAPUA-N.GUINEA Mainyanda I.1980 25km W Bulolo W. G. Ulrich 600m".

Diagnosis. Within the *G. picta* species group, *G. verpa* JÄCH differs as follows: 1) relatively small eyes; 2) dorsal surface more or less shiny; 3) colour pattern reduced; 4) elytral apices narrowly truncated; 5) penis distinctly long, slightly sinuate in lateral view; 6) pronotum shiny on raised lateral margins of median groove, on tubercles and on mesal portion in basal half.

Redescription. Body form elongate (Fig. 78); CL in ♂♂ (3.59–3.74 mm, $\bar{S}=3.66\pm0.07$), in ♀♀ (3.28–3.69 mm, $\bar{S}=3.49\pm0.20$); EW in ♂♂ (1.33–1.38 mm, $\bar{S}=1.37\pm0.02$), in ♀♀ (1.28–1.44 mm, $\bar{S}=1.36\pm0.07$), CL/EW in ♂♂ (2.63–2.71, $\bar{S}=2.67\pm0.04$), in ♀♀ (2.52–2.67, $\bar{S}=2.57\pm0.07$).

Colour pattern: pronotum black with slightly paler narrow anterior margin; elytra with yellowish: humeri, raised prebasal portion of interval 3 (sometimes fused with humeral marking), and very indistinct short portion of interval 5 in about 0.75.

Head. HW in ♂♂ (0.66–0.71 mm, $\bar{S}=0.68\pm0.02$), in ♀♀ (0.62–0.71 mm, $\bar{S}=0.67\pm0.04$); ID in ♂♂ (0.35–0.38 mm, $\bar{S}=0.36\pm0.02$), in ♀♀ (0.35–0.38 mm, $\bar{S}=0.37\pm0.02$); ED in ♂♂ (0.26–0.29 mm, $\bar{S}=0.29\pm0.01$), in ♀♀ (0.26–0.29 mm, $\bar{S}=0.29\pm0.01$); HW/ID in ♂♂ (1.77–1.92, $\bar{S}=1.86\pm0.06$), in ♀♀ (1.75–1.92, $\bar{S}=1.82\pm0.08$). Labrum with setigerous punctures in anterior half, posterior half glabrous, narrow anterior margin paler; clypeus as long as labrum, with sparse setigerous punctures; fronto-clypeal suture narrowly depressed; frons and vertex plicate-micropunctured, with sparse pale setae; eyes relatively small, oval in lateral view and slightly convex in dorsal view, with margin raised on inner side.

Thorax. Pronotum slightly wider than long, widest posteriorly of middle; PL in ♂♂ (0.97–1.05 mm, $\bar{S}=1.02\pm0.03$), in ♀♀ (0.95–1.05 mm, $\bar{S}=1.00\pm0.05$); PW in ♂♂ (1.05–1.13 mm, $\bar{S}=1.08\pm0.03$), in ♀♀ (0.97–1.13 mm, $\bar{S}=1.05\pm0.07$); AP in ♂♂ (0.74–0.77 mm, $\bar{S}=0.76\pm0.01$), in ♀♀ (0.74–0.82 mm, $\bar{S}=0.78\pm0.03$); lateral margins explanate; anterior angles produced and almost rounded; anterior sublateral tubercles rounded with longer pale setae; posterior tubercles about as half long as PL, carinate, not reaching posterior pronotal margin, with longer pale setae; median groove large, deeply impressed, plicate-micropunctured; lateral edges of groove raised, shiny, sparsely micropunctured; prebasal admedian pits vestigial; surface with short pale setae, anterior half densely irregularly micropunctured, posterior half with sparse micropunctures, interstices shiny. Prosternum with disc

shallowly plicate; prosternal process depressed mesally, plicate; lateral margins microreticulate, raised; posterior margin with narrow distinctly projected median protuberance. Scutellum subpentagonal, almost flat, glabrous. Mesosternum slightly impressed mesally, without oblique microreticulate carinae; surface plicate-micropunctured. Metasternum about twice as long as mesosternum; disc slightly raised in anterior half and widely, shallowly depressed along longitudinal suture in posterior half; admedian prebasal punctures inconspicuous; sublateral carinae absent; surface covered by plastron structures except of narrow, almost glabrous median portion of disc and anterior margin; disc of males with longer yellowish setae. Elytra parallel-sided in anterior 0.6, then continuously converging toward narrowly truncated apices; EL in ♂♂ (2.59–2.72 mm, $\bar{S}=2.64\pm0.05$), in ♀♀ (2.31–2.67 mm, $\bar{S}=2.49\pm0.16$); lateral margins explanate and feebly serrate; striae punctures largest on disc, deeply impressed; interval 3 distinctly raised anteriorly, interval 5 feebly raised in whole length, interval 7 indistinctly raised in basal third; surface shiny with dense short setae. Legs brown to dark brown; femora almost glabrous; tibiae finely micropunctured and grooved; FT in ♂♂ (0.91–0.94 mm, $\bar{S}=0.92\pm0.02$), in ♀♀ (0.85–0.97 mm, $\bar{S}=0.91\pm0.05$); MT in ♂♂ (0.87–0.91 mm, $\bar{S}=0.89\pm0.02$), in ♀♀ (0.82–0.94 mm, $\bar{S}=0.88\pm0.05$); apex of male metatibiae (Fig. 162); HT in ♂♂ (0.97–1.03 mm, $\bar{S}=1.02\pm0.03$), in ♀♀ (0.92–1.04 mm, $\bar{S}=0.99\pm0.06$); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process depressed; mesal portion of process and disc of ventrites glabrous, with short yellow setae; lateral portions of process and ventrites covered by plastron structures; apex of ventrite 5 deeply emarginated mesally, sides of apical emargination more distinctly produced posteriad in males.

Aedeagus. Penis extremely long and slender, in lateral view finely sinuate.

Sexual dimorphism. Males are distinguished by subapically excavate metatibiae with apical spines, longer yellow setae on disc of mesosternum and more distinctly emarginate apex of ventrite 5.

Distribution. Papua New Guinea.

Graphelmis diaphoroderes JÄCH, 1985

(Figs 79, 105–108, 163)

Graphelmis diaphoroderes JÄCH, 1985: 237, 239, Figs 7, 11

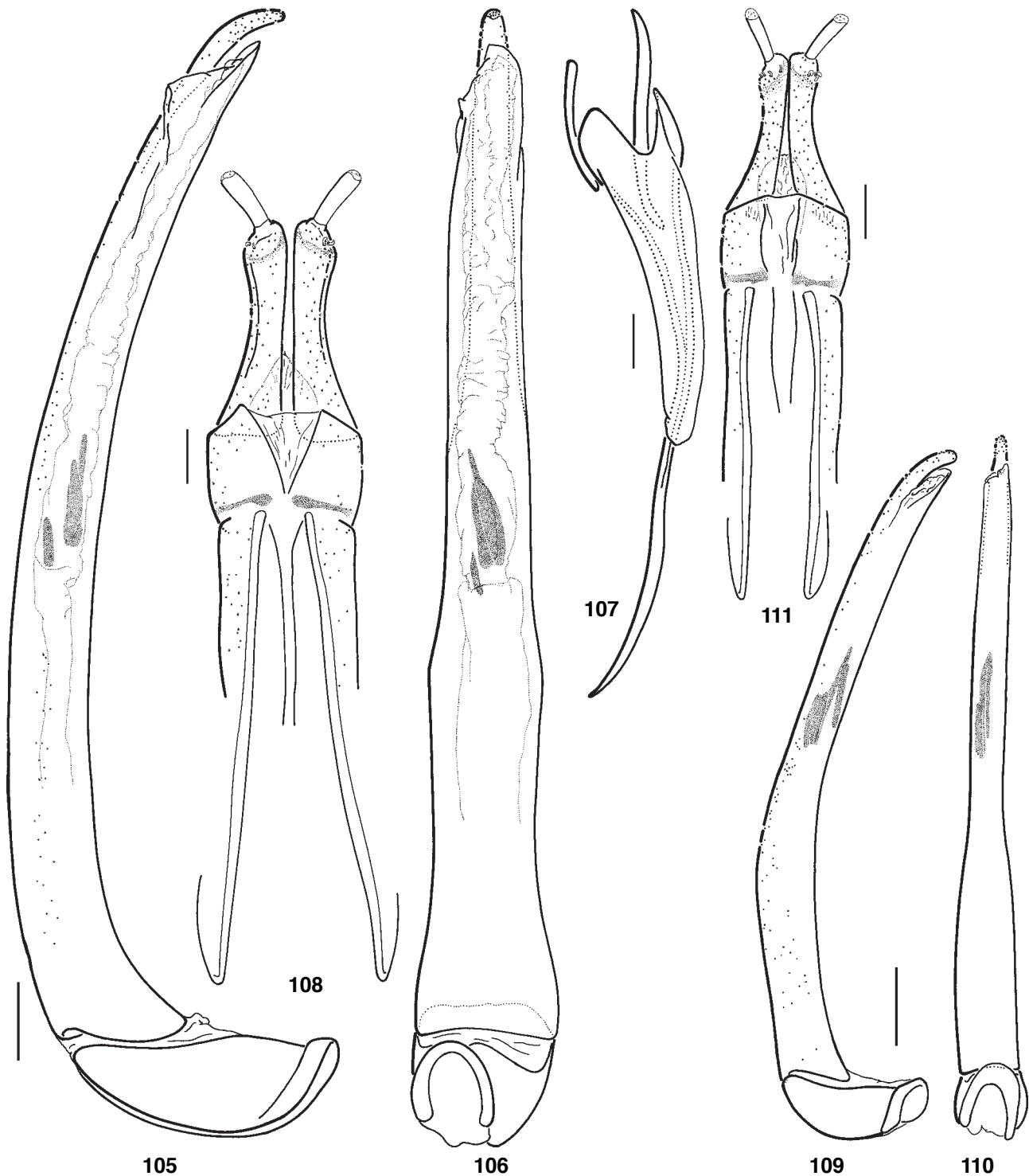
Type locality: PNG/EH Prov. Umg. Onerunka Ramu River.

Material examined. Paratypes (NMW): 4♂♂: "01.XII. 79 PNG/EHProv. Umg. Onerunka Ramu Riv."; 1♂, 3♀♀: "8.XII. 79 PNG/EHProv. Umg. Onerunka Ramu Riv."; 4♂♂: "16.II. 80 PNG/EHProv. Umg. Kainantu Onerunka"; 2♂♂: "18.VI. 79 PNG/EHProv. Umg. Onerunka Ramu Riv."; 4♂♂, 3♀♀: "18.VI. 79 PNG/EHProv. Umg. Iqipinti Korindaiop. R."; 1♀: "Wau, N. Guinea 1250m, II.13-III.13. 79 J. Sedlacek". **Additional material** (NMW): 2♂♂, 1♀: "PAPUA-N.GUINEA Mainyanda I.1980 25kmW Bulolo W.G. Ulrich 600m"; 1♂, 1♀: "PAPUA NG 6./7.88Sepik-Ramu Basin ♂♂ leg. Dudgeon"

Diagnosis. Within the *G. picta* species group, *G. diaphoroderes* differs as follows: 1) elytral apices narrowly truncated; 2) margins of pronotal median groove widely raised; 3) elytral yellow pattern well developed; 4) distal end of male metatibiae widened anteriorly of excavation, apical spine small; 5) mesal portion of ventrites rough; 6) penis long, in lateral view finely continuously curved, in ventral view extended in apical 0.65.

Redescription. Body form elongate (Fig. 79); CL in ♂♂ (3.13 – 3.36 mm, $\bar{S}= 3.22 \pm 0.08$), in ♀♀ (3.08 – 3.21 mm, $\bar{S}= 3.14 \pm 0.06$); EW in ♂♂ (1.18 – 1.31 mm, $\bar{S}= 1.25 \pm 0.04$), in ♀♀ (1.23 – 1.28 mm, $\bar{S}= 1.25 \pm 0.02$); CL/EW in ♂♂ (2.52 – 2.65, $\bar{S}= 2.58 \pm 0.04$), in ♀♀ (2.49 – 2.60, $\bar{S}= 2.52 \pm 0.05$).

Colour pattern: pronotum with slightly paler anterior



Figs 105–111. 105–108 *Graphelmis diaphoroderes* JÄCH: 105) aedeagus lateral view; 106) aedeagus ventral view; 107) spiculum gastrale and sternite 9; 108) ovipositor; 109–111 *Graphelmis lomata* JÄCH: 109) aedeagus lateral view; 110) aedeagus ventral view; 111) ovipositor. Scale bars: 0.1mm.

margin; elytra with oblique prebasal spots and pair of irregular subapical spots.

Head. HW in ♂♂ (0.56–0.65 mm, $\bar{S}=0.60\pm0.03$), in ♀♀ (0.59–0.62 mm, $\bar{S}=0.60\pm0.01$); ID in ♂♂ (0.29–0.35 mm, $\bar{S}=0.32\pm0.02$), in ♀♀ (0.31–0.34 mm, $\bar{S}=0.32\pm0.01$); ED in ♂♂ (0.24–0.26 mm, $\bar{S}=0.25\pm0.02$), in ♀♀ (0.24–0.29 mm, $\bar{S}=0.27\pm0.03$); HW/ID in ♂♂ (1.82–1.90, $\bar{S}=1.86\pm0.03$), in ♀♀ (1.74–2.00, $\bar{S}=1.90\pm0.10$). Labrum anteriorly paler, with setigerous punctures; clypeus shorter than labrum, rough, mesally raised; fronto-clypeal suture depressed; frons and vertex rough with short tiny setae; eyes large, oval in lateral view and convex in dorsal view, with raised margins.

Thorax. Pronotum slightly wider than long, widest in about middle; PL in ♂♂ (0.87–0.95 mm, $\bar{S}=0.91\pm0.03$), in ♀♀ (0.85–0.90 mm, $\bar{S}=0.88\pm0.02$); PW in ♂♂ (0.90–1.08 mm, $\bar{S}=0.96\pm0.06$), in ♀♀ (0.87–0.92 mm, $\bar{S}=0.90\pm0.03$); AP in ♂♂ (0.67–0.74 mm, $\bar{S}=0.70\pm0.03$), in ♀♀ (0.67–0.72 mm, $\bar{S}=0.70\pm0.02$); lateral margins explanate; anterior angles produced; anterior sublateral tubercles rounded; posterior tubercles less than half as long as PL, carinate, reaching posterior pronotal margin; median groove large; lateral margins of groove widely raised; prebasal admedian pits small, feebly depressed; surface densely irregularly micropunctured; tubercles with a few tiny setae; punctures sparse on borders of groove and tubercles. Prosternum: prosternal process slightly narrowed posteriad, with lateral margins raised; posterior margin with long median protuberance; surface of prosternum plicate. Scutellum subtriangular, flat; surface almost glabrous. Mesosternum deeply impressed mesally, without oblique microreticulate carinae; surface microreticulate in anterior third, posterior two-thirds plicate. Metasternum about twice as long as mesosternum; anterior third more or less raised mesally; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture widely depressed in posterior half; most of disc covered by plastron structures; tiny area posteriorly of anterior margin and narrow mesal portion along median suture rough; disc of males admedially with sparse yellow setae. Elytra with sides parallel in anterior two-thirds, then straightly converging toward narrowly truncated apices; EL in ♂♂ (2.26–2.41 mm, $\bar{S}=2.32\pm0.05$), in ♀♀ (2.21–2.31 mm, $\bar{S}=2.26\pm0.05$); lateral margins explanate, finely serrate; striae punctures large, well impressed; interval 3 slightly raised anteriorly; elytral surface finely rough to almost glabrous with a few short setae. Legs: femora and tibiae with pale setae; FT in ♂♂ (0.79–0.82 mm, $\bar{S}=0.80\pm0.02$), in ♀♀ (0.75–0.79 mm, $\bar{S}=0.77\pm0.02$); MT in ♂♂ (0.76–0.82 mm, $\bar{S}=0.79\pm0.02$), in ♀♀ (0.74–0.76 mm, $\bar{S}=0.75\pm0.01$); metatibiae of males subapically widened and shallowly excavate; apical spine small, acuminate (Fig. 163); HT in ♂♂ (0.85–0.90 mm, $\bar{S}=0.87\pm0.03$), in ♀♀ (0.82–0.85 mm, $\bar{S}=0.84\pm0.02$); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process almost flat; mesal portion of disc of process and ventrites densely micropunctured; admedian and lateral portions of ventrites covered by plastron

structures; apex of ventrite 5 rough, sides of apical emargination distinctly produced posteriad. Sternite 9 and spiculum gastrale (Fig. 107).

Aedeagus (Figs 105, 106). Penis long; in lateral view gradually curved with base finely produced ventrad; in ventral view straight, with sides extended in apical 0.65; base slightly widened; membranous endophallus with three sclerites; phallobasis short, about 0.25× as long as penis.

Ovipositor (Fig. 108) with terminal segment slender and slightly curved; preterminal segment about 3.6× as long as terminal, outer side concave; distal sclerite subquadrate, almost 0.6× as long as preterminal; basal segment about 1.53× as long as preterminal and distal sclerites combined; ventral fulcrum almost straight.

Sexual dimorphism. Males are distinguished by distinctly widened metatibial apices, and by yellow setae on disc of metasternum.

Distribution. Papua New Guinea.

Graphelmis lomata JÄCH, 1985

(Figs 80, 109–111, 164)

Graphelmis lomata JÄCH, 1985: 236–237, Figs 6, 10

Type locality: PNG/Morobe Umg. Gurakor

Material examined. Paratypes (NMW): 4♂♂, 1♀: “I 80 PNG/Morobe Umg. Gurakor”. **Additional material** (NMW, CKB): 30♂♂, 37♀♀: “Papua Nlle Guinée Morobe, I. 81 env. de Gurakor, W. G. Ulrich”; 1♀: “PAPUA N.G.: Morobe Prov. Timini, 200–400m 7.4.1998 leg. A. Riedel”; 3♀♀: “PAPUA – N. GUINEA env. Madang Nagada VI. 79 W. G. Ulrich”.

Diagnosis. Within the *G. picta* species group, *G. lomata* JÄCH, 1985 differs as follows: 1) frons and vertex plicate-microreticulate; 2) pronotum plicate-microreticulate; 3) apical spine of male metatibiae wide, truncate; 4) penis abruptly widened in basal half.

Redescription. Body form elongate (Fig. 80); CL in ♂♂ (2.13–2.31 mm, $\bar{S}=2.21\pm0.06$), in ♀♀ (2.13–2.38 mm, $\bar{S}=2.27\pm0.10$); EW in ♂♂ (0.92–0.95 mm, $\bar{S}=0.93\pm0.01$), in ♀♀ (0.87–0.97 mm, $\bar{S}=0.93\pm0.04$), CL/EW in ♂♂ (2.31–2.43, $\bar{S}=2.38\pm0.04$), in ♀♀ (2.42–2.51, $\bar{S}=2.45\pm0.03$).

Colour pattern: pronotum with yellowish anterior margin; elytra with yellowish prebasal spots widely separated mesally, short indistinct admedian stripes in about midlength and pair of oblique stripes in about 0.75.

Head. HW in ♂♂ (0.47–0.49 mm, $\bar{S}=0.47\pm0.01$), in ♀♀ (0.44–0.50 mm, $\bar{S}=0.48\pm0.02$); ID in ♂♂ (0.21–0.24 mm, $\bar{S}=0.22\pm0.01$), in ♀♀ (0.21–0.24 mm, $\bar{S}=0.23\pm0.01$); ED in ♂♂ (0.22–0.24 mm, $\bar{S}=0.23\pm0.01$), in ♀♀ (0.21–0.24 mm, $\bar{S}=0.23\pm0.01$); HW/ID in ♂♂ (2.06–2.29, $\bar{S}=2.20\pm0.10$), in ♀♀ (2.06–2.20, $\bar{S}=2.12\pm0.05$). Labrum with setigerous punctures in anterior half, posterior half glabrous, anterior margin paler; clypeus about as long as labrum, mesally raised, microreticulate; fronto-clypeal suture depressed; frons and vertex plicate-microreticulate; eyes large, oval in lateral view and convex in dorsal view, with margin raised on inner side.

Thorax. Pronotum slightly wider than long, widest in basal third; PL in ♂♂ (0.59–0.64 mm, $\bar{S}=0.62 \pm 0.02$), in ♀♀ (0.62–0.69 mm, $\bar{S}=0.66 \pm 0.03$); PW in ♂♂ (0.67–0.69 mm, $\bar{S}=0.67 \pm 0.01$), in ♀♀ (0.64–0.72 mm, $\bar{S}=0.68 \pm 0.03$); AP in ♂♂ (0.51–0.54 mm, $\bar{S}=0.52 \pm 0.01$), in ♀♀ (0.51–0.56 mm, $\bar{S}=0.55 \pm 0.02$); lateral margins explanate; anterior angles produced; anterior sublateral tubercles weak; posterior tubercles almost half as long as PL, carinate, reaching posterior pronotal margin; median groove large; lateral margins of groove raised, somewhat carinate; prebasal admedian pits vestigial; surface sparsely setose, plicate-microreticulate. Prosternum microreticulate; prosternal process flat, with lateral margins weakly raised; posterior margin with well projected median protuberance. Scutellum subpentagonal, flat; surface densely micropunctured. Mesosternum impressed mesally, without oblique microreticulate carinae; surface microreticulate. Metasternum about twice as long as mesosternum; disc slightly raised about in anterior third and widely, shallowly depressed along median longitudinal suture in posterior two-thirds; admedian prebasal punctures absent; sublateral carinae absent; surface covered by plastron structures except of microreticulate anterior margin and narrow median portion (narrower in females) along suture; disc of males with longer yellow setae. Elytra parallel-sided in anterior 0.7, then continuously converging toward almost rounded apices; EL in ♂♂ (1.51–1.69 mm, $\bar{S}=1.59 \pm 0.06$), in ♀♀ (1.51–1.69 mm, $\bar{S}=1.62 \pm 0.08$); lateral margins explanate and densely serrate; striae punctures large, moderately deeply impressed, deeper on sides; intervals 3, 5 and 7 weakly raised; surface rough with sparse short setae. Legs dark yellow; femora microreticulate; tibiae finely micropunctured and grooved; FT in ♂♂ (0.56–0.59 mm, $\bar{S}=0.56 \pm 0.01$), in ♀♀ (0.56–0.59 mm, $\bar{S}=0.57 \pm 0.02$); MT in ♂♂ (0.53–0.56 mm, $\bar{S}=0.54 \pm 0.01$), in ♀♀ (0.51–0.56 mm, $\bar{S}=0.54 \pm 0.02$); apex of male metatibiae (Fig. 164); HT in ♂♂ (0.59–0.62 mm, $\bar{S}=0.61 \pm 0.01$), in ♀♀ (0.57–0.65 mm, $\bar{S}=0.61 \pm 0.03$); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process slightly depressed mesally; mesal portion of process and disc of ventrites microreticulate (reticulation diminishing toward abdominal apex); lateral portions of process and ventrites covered by plastron structures; apex of ventrite 5 deeply mesally excavated, with sides of apical excavation produced posteriad.

Aedeagus (Figs 109, 110). Penis short and slender, distinctly widened in basal half; base feebly produced ventrad (lateral view).

Ovipositor (Fig. 111) with terminal segment slender, almost straight; preterminal segment about 3.2× as long as terminal, outer side concave; distal sclerite elongate, about 0.7× as long as preterminal; basal segment about 1.2× as long as preterminal and distal sclerites combined; ventral fulcrum almost straight.

Sexual dimorphism. Males are distinguished by modified metatibiae, longer yellow setae on disc of meta-

sternum and by more produced sides of apical excavation of ventrite 5.

Distribution. Papua New Guinea.

***Graphelmis posoica* sp.nov.**

(Figs 112, 118–120, 165)

Type locality: Indonesia, Sulawesi, Tenga, Poso, Pososee, Tentena ca. 20km Richtg. Bada.

Material examined. **Holotype** ♂ (NMW): “Indonesia, Sulawesi, Tenga, Poso, Pososee, Tentena ca. 20km Richtg. Bada. Hiermeier leg. 2.05.94”. **Paratypes** (NMW, CKB): 9 ♀♀ with the same label as holotype; 1 ♂: “16/viii/1987 Palau Batu Daka, Togians, c Sulawesi, River nr. Wakai”; 1 ♀: “17/viii/1987 Palau Batu Daka, Togians, e Sulawesi, River nr. Wakai”; 13ex.: “INDONESIA C-SULAWESI, W coast of lake POSO, TAIPA env., 10-11.iv 1999, Bečvář & Záborský lgt.”; 15ex.: “INDONESIA C-SULAWESI, PERUHUMPENAI Mts. Res., ca. 50km N of WOTU, 17.iv. 1999, at light, Bečvář & Záborský lgt.”.

Diagnosis. Within the *G. picta* species group, *G. posoica* sp.nov. differs as follows: 1) anterior pronotal margin shiny; 2) scutellum shiny; 3) frons and vertex micropunctured; 4) pronotal tubercles and raised margins of median groove sparsely micropunctured, interstices shiny; 5) penis small and slender.

Description. Body form elongate (Fig. 112); CL in ♂ 2.18 mm, in ♀♀ (2.26–2.46 mm, $\bar{S}=2.34 \pm 0.07$); EW in ♂ 0.91 mm, in ♀♀ (0.91–1.00 mm, $\bar{S}=0.97 \pm 0.04$); CL/EW in ♂ 2.39, in ♀♀ (2.34–2.48, $\bar{S}=2.41 \pm 0.04$).

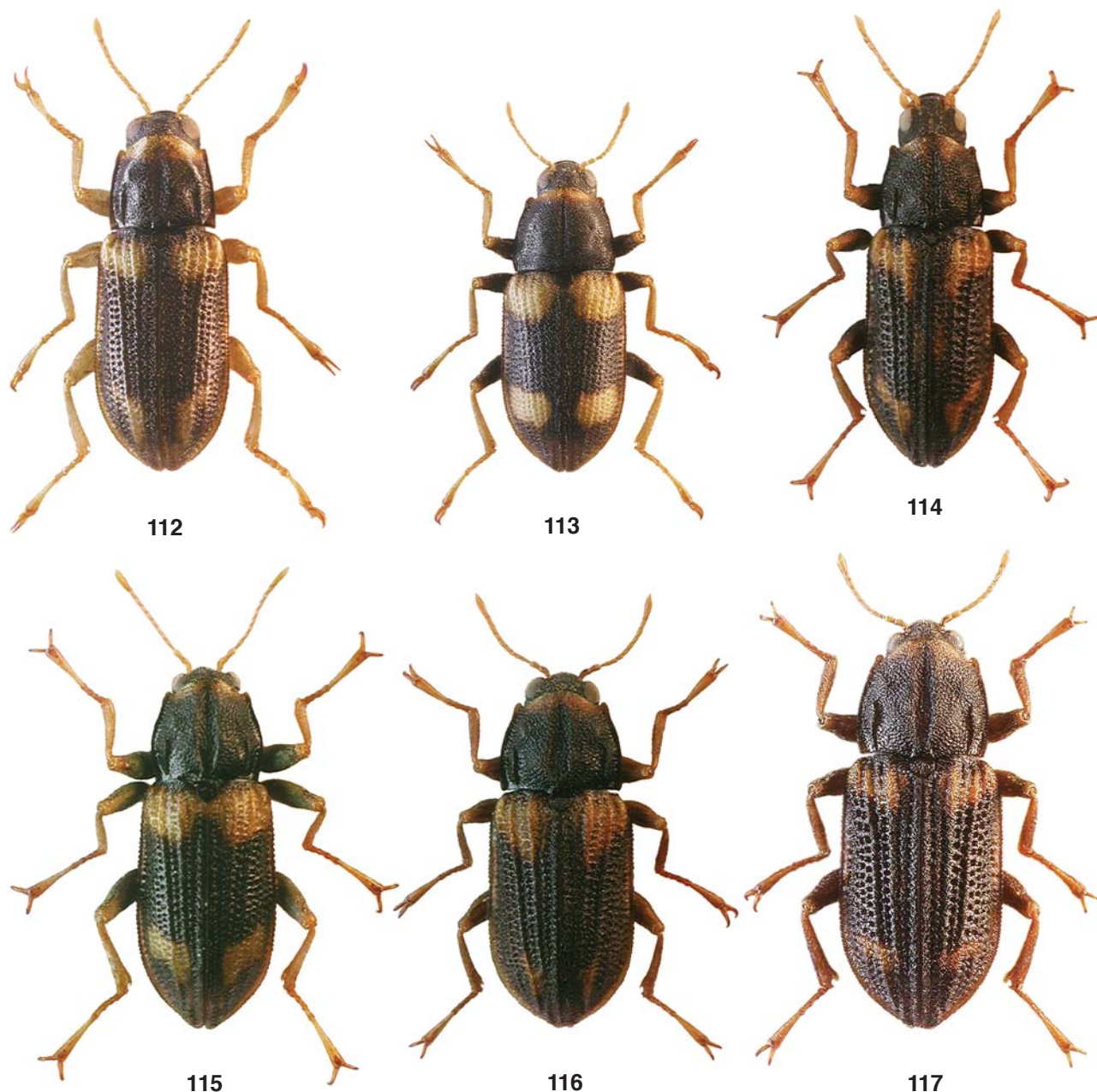
Colour pattern: pronotum with yellowish anterior margin (widened mesally); elytra with almost rounded prebasal spots and pair of irregular subapical spots.

Head. HW in ♂ 0.49 mm, in ♀♀ (0.50–0.54 mm, $\bar{S}=0.52 \pm 0.02$); ID in ♂ 0.22 mm, in ♀♀ (0.24–0.25 mm, $\bar{S}=0.24 \pm 0.01$); ED in ♂ 0.24 mm, in ♀♀ (0.24–0.26 mm, $\bar{S}=0.25 \pm 0.01$); HW/ID in ♂ 2.20, in ♀♀ (2.06–2.25, $\bar{S}=2.17 \pm 0.07$). Labrum finely microreticulate, with setigerous punctures; anterior half paler. Clypeus about as long as labrum; lateral portions microreticulate; mesal portion glabrous; surface sparsely micropunctured; punctures setigerous; fronto-clypeal suture narrow; surface of frons and vertex densely irregularly micropunctured and sparsely setose; eyes large, oval in lateral view and convex in dorsal view, with raised margin.

Thorax. Pronotum wider than long, widest posteriorly of middle; PL in ♂ 0.65 mm, in ♀♀ (0.68–0.72 mm, $\bar{S}=0.69 \pm 0.02$); PW in ♂ 0.71 mm, in ♀♀ (0.72–0.79 mm, $\bar{S}=0.75 \pm 0.03$); AP in ♂ 0.54 mm, in ♀♀ (0.56–0.60 mm, $\bar{S}=0.58 \pm 0.02$); lateral margins explanate; anterior angles produced; anterior sublateral tubercles fine; posterior tubercles carinate, almost reaching posterior pronotal margin; median groove large; lateral margins of groove raised, but not carinate; prebasal admedian pits indistinct; surface irregularly micropunctured, with sparse tiny setae on tubercles and margins of groove; interstices shiny. Prosternum: prosternal process with sides parallel; lateral margins almost flat; posterior margin with distinct median

protuberance; surface of prosternum finely microreticulate; surface of process finely microreticulate. Scutellum subtriangular, flat; surface shiny with a few small punctures. Mesosternum impressed mesally; sides of disc convex in cross-section; surface microreticulate. Metasternum about twice as long as mesosternum, almost flat; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture depressed in about posterior two-thirds (depression narrow in females, wider in males); almost entire surface covered by plastron structures; anterior margin and mesal portion along suture finely micropunctured; disc of males admedially with a few long pale setae. Elytra with sides parallel in anterior two-thirds, then continuously converging toward finely produced api-

ces; EL in ♂ 1.53 mm, in ♀♀ (1.59 – 1.74 mm, \bar{S} = 1.64 ± 0.05); lateral margins explanate and serrate; strial punctures well impressed; interval 3 raised anteriorly; entire interval 5 finely raised; interval 7 almost flat; elytral surface finely plicate; intervals with sparse short setae. Legs: femora microreticulate; tibiae finely longitudinally grooved or almost glabrous in anterior half and finely microreticulate in posterior half; FT in ♂ 0.53 mm, in ♀♀ (0.53 – 0.56 mm, \bar{S} = 0.54 ± 0.01); MT in ♂ 0.53 mm, in ♀♀ (0.50 – 0.53 mm, \bar{S} = 0.52 ± 0.01); metatibiae of males widened apicad and narrowly incised preapically; apical spine small and distinctly acuminate (Fig. 165); HT in ♂ 0.59 mm, in ♀♀ (0.56 – 0.59 mm, \bar{S} = 0.58 ± 0.01); length of tarsomere 5 equal to combined length of tarsomeres 1–4.



Figs 112–117 Habitus of: 112) *Graphelmis posoica* sp.nov.; 113) *Graphelmis insolita* sp.nov.; 114) *Graphelmis strbaki* sp.nov.; 115) *Graphelmis reitteri* sp.nov.; 116) *Graphelmis togianica* sp.nov.; 117) *Graphelmis jesusi* sp.nov.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process finely depressed mesally; narrow mesal portion of process and ventrites 1, 2 microreticulate; mesal portion of remaining ventrites glabrous; admedian and lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination produced posteriad.

Aedeagus (Figs 118, 119). Penis slender; in lateral view curved with base slightly produced ventrad; in ventral view finely sinuate, slightly widened toward base; membranous endophallus with three weak sclerites; phallobasis short, about 0.25× as long as penis.

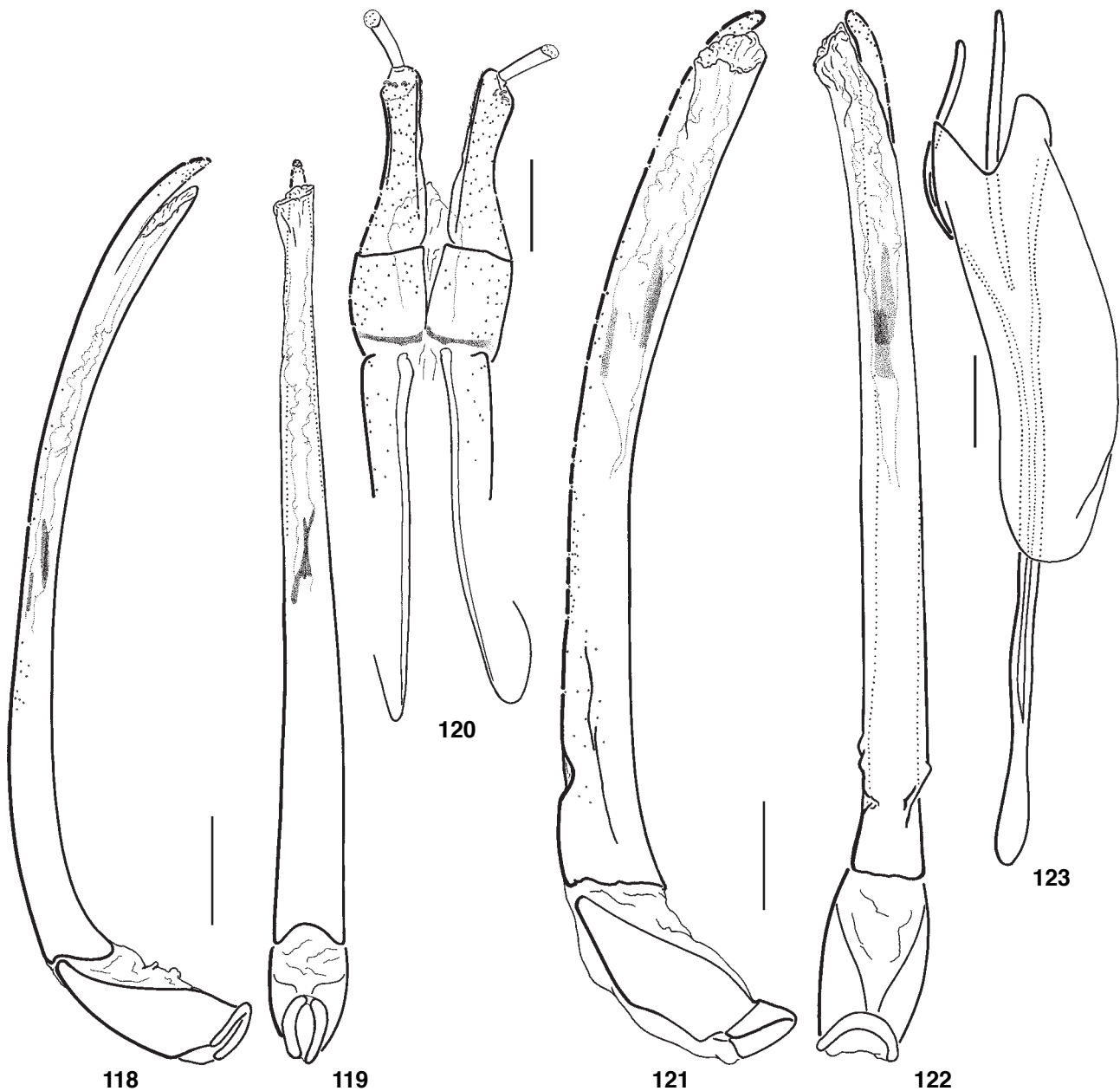
Ovipositor (Fig. 120) with terminal segment slender

and almost straight; preterminal segment about 3.4× as long as terminal, outer side concave; distal sclerite subquadrate, about half as long as preterminal; basal segment about 1.3× as long as preterminal and distal sclerites combined; ventral fulcrum slightly sinuate in anterior portion then somewhat curved.

Sexual dimorphism. Males are well distinguished by widened and excavated metatibial apices.

Distribution. So far known only from Sulawesi (Indonesia).

Etymology. Named for the lake Poso, situated near the type locality in central Sulawesi.



Figs 118–123. 118–120 *Graphelmis posoica* sp.nov.: 118) aedeagus lateral view; 119) aedeagus ventral view; 120) ovipositor; 121–123 *Graphelmis insolita* sp.nov.: 121) aedeagus lateral view; 122) aedeagus ventral view; 123) spiculum gastrale and sternite 9. Scale bars: 0.1mm.

***Graphelmis insolita* sp.nov.**

(Figs 113, 121–123, 166)

Type locality: INDONESIA Irian Jaya Nabire 70km, Kwatisore S km 60 W, Yamor lake 134°51'W, 03°38'S.

Material examined. Holotype ♂ (NMW): "INDONESIA Irian Jaya Nabire 70km, Kwatisore S km 60 W, Yamor lake 134°51'W, 03°38'S 04.III.1998 leg. A.Weigel KL".

Diagnosis. Within the *G. picta* species group, *G. insolita* sp.nov. differs as follows: 1) slightly obovate body shape; 2) anterior pronotal tubercles indicated only, posterior tubercles absent; 3) pronotal median longitudinal groove narrow; 4) mesosternum with oblique transverse carinae; 5) penis in lateral view incised anteriorly; 6) scutellum shiny; 7) elytral punctures shallowly impressed; 8) prebasal elytral yellow spots rounded.

Description. Habitus (Fig. 113); CL in ♂ 2.53 mm; EW in ♂ 1.12 mm; CL/EW in ♂ 2.26.

Colour pattern: pronotum with yellowish narrow anterior margin; elytra with almost rounded yellowish prebasal spots and pair of subquadrate subapical spots.

Head. HW in ♂ 0.53 mm; ID in ♂ 0.26 mm; ED in ♂ 0.24 mm; HW/ID in ♂ 2.00. Labrum paler; anterior two thirds with dense long pale setae; posterior third glabrous; clypeus about as long as labrum, rough and setose; frontoclypeal suture narrow; surface of frons and vertex rough and sparsely setose; eyes large, oval in lateral view and convex in dorsal view, with raised margins.

Thorax. Pronotum wider than long, widest in about basal third; PL in ♂ 0.76 mm; PW in ♂ 0.90 mm; AP in ♂ 0.62 mm; lateral margins explanate; anterior angles produced; anterior sublateral tubercles fine; posterior tubercles absent; median groove narrow, without raised lateral margins; prebasal admedian pits absent; surface densely irregularly micropunctured, with sparse tiny setae. Prosternum: prosternal process with sides parallel; lateral margins slightly raised, microreticulate; posterior margin with wide median protuberance; surface plicate-microreticulate. Scutellum almost rounded, flat; surface shiny with a few small punctures. Mesosternum impressed mesally, with oblique transverse carinae; surface microreticulate; posterior half with fine plications. Metasternum about twice as long as mesosternum, almost flat; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture depressed in about posterior 0.75; sides of disc finely irregularly grooved; almost entire surface covered by plastron structures; anterior margin and mesal portion along suture finely rugulose; disc of males admedially with a few long yellow setae. Elytra with sides parallel in anterior 0.6, then continuously converging toward nearly rounded apices; EL in ♂ 1.76 mm; lateral margins explanate and serrate; striae punctures feebly impressed; intervals almost flat; elytral surface finely plicate-micropunctured; intervals with sparse tiny short setae. Legs: femora microreticulate; tibiae finely microreticulate; FT in ♂ 0.68 mm; MT in ♂ 0.65 mm; metatibiae of males slightly widened apicad and preapically excavated; apical

spine acuminate (Fig. 166); HT in ♂ 0.71 mm; length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process finely depressed mesally; narrow mesal portion of process and ventrites microreticulate; admedian and lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination slightly produced posteriad. Sternite 9 and spiculum gastrale (Fig. 123).

Aedeagus (Figs 121, 122). Penis slender; in lateral view slightly curved and incised anteriorly; base only finely widened; in ventral view almost straight, slightly widened toward base; membranous endophallus with three weak sclerites; phallobasis short, about 0.28× as long as penis.

Female unknown.

Distribution. So far known only from Irian Jaya (Indonesia).

Etymology: from Latin *insolitus* – strange, referring to distinctly different look.

***Graphelmis strbaki* sp.nov.**

(Figs 114, 124–127, 167)

Type locality: IRIAN JAYA: Nabire Prov., Nabire - Ilaga, km 117 Unipo, 150m.

Material examined. Holotype ♂ (NMW): "IRIAN JAYA: Nabire Prov., Nabire - Ilaga, km 117 Unipo, 30.9.1997, 150m, leg. M. Balke (♂ 7)". **Paratypes** (NMW, CKB): 1 ♂ with the same label as holotype; 3 ♂♂, 1 ♀: "IRIAN JAYA: Nabire Prov., Nabire - Ilaga, km 100 Kali Utowa, 8.10.1997, leg. M. Balke (♂ 10)"; 5 ♂♂: "IRIAN JAYA: Nabire Prov., Nabire - Ilaga, km 35 Kali Cemara, 23.10.1997, leg. M. Balke (♂ 13)"; 1 ♀: "IRIAN JAYA: Kabup. Nabire, 30km S Nabire, Kali Cemara 150m, 15.8.1997, leg. M. Balke (CEM Lux)"; (NME): 2 ♀♀: "INDONESIA or. Irian Jaya 35km S Nabire Topo, Bumi Riv. 150m 13.I.1996 leg. A. Weigel"; 1 ♂, 2 ♀♀: "INDONESIA Irian Jaya Nabire, S road km 35, Bumi-River 13.I.1996 leg. Weigel"; 1 ♀: "INDONESIA Irian Jaya 30km S Nabire Topo Bumi Riv. 31.I.1996 leg. A. Weigel"; 1 ♂: 1 ♂: "INDONESIA Irian Jaya Nabire 70km, Kwatisore S km 60 W, Yamor lake 134°51'W, 03°38'S 04.III.1998 leg. A. Weigel KL"

Diagnosis. Within the *G. picta* species group, *G. strbaki* sp.nov. differs as follows: 1) elytral marking dark yellow or reddish, weak and stripe-like; 2) metatibial spines of males small, with apex almost truncated; 3) ventral side dark; 4) elytral apices slightly produced; 5) base of penis in lateral view distinctly produced ventrad; 6) femora dark except of apical part; 7) disc of prosternum plicate-microreticulate.

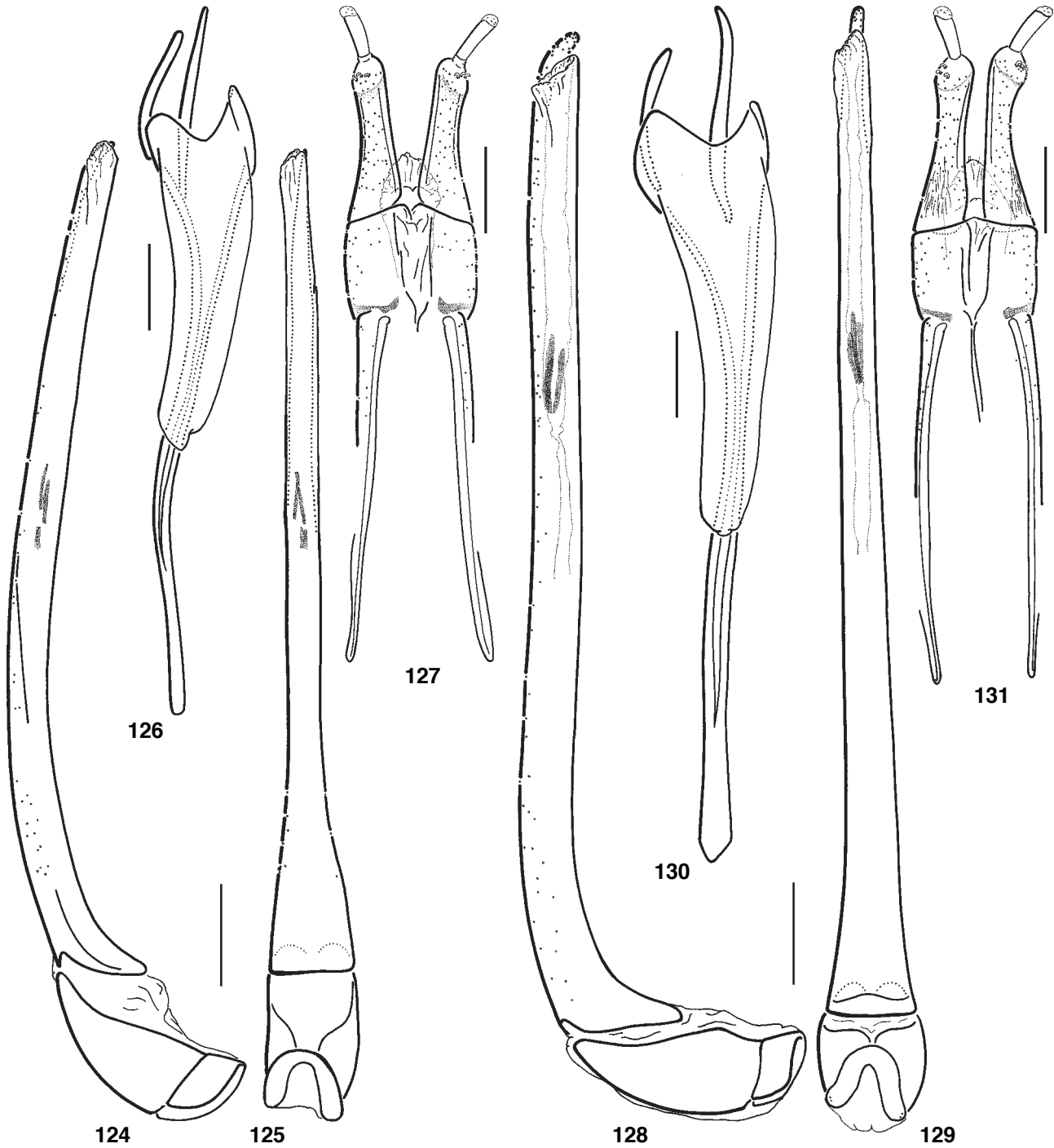
Description. Body form elongate (Fig. 114); CL in ♂♂ (2.21 – 2.53 mm, \bar{S} = 2.30 ± 0.12), in ♀♀ (2.29, 2.31 mm); EW in ♂♂ (0.84 – 1.00 mm, \bar{S} = 0.89 ± 0.05), in ♀♀ (0.88, 0.91 mm); CL/EW in ♂♂ (2.50 – 2.63, \bar{S} = 2.57 ± 0.05), in ♀♀ (2.52, 2.62).

Colour pattern: pronotum with paler, mesally widened, anterior margin; elytra with more or less reduced anterior spots, elongated admedian spots in middle and pair of curved moderately developed subapical spots.

Head. HW in ♂♂ (0.41 – 0.50 mm, \bar{S} = 0.47 ± 0.03), in ♀♀ 0.47 mm; ID in ♂♂ (0.19 – 0.22 mm, \bar{S} = 0.21 ± 0.01), in ♀♀ (0.21, 0.24 mm); ED in ♂♂ (0.19 – 0.24 mm, \bar{S} = 0.22 ± 0.02), in ♀♀ (0.21, 0.24 mm); HW/ID in ♂♂ (2.14 – 2.29, \bar{S} = 2.23 ± 0.07), in ♀♀ (2.00, 2.29 mm). Labrum almost glabrous, paler anteriorly, with thin long setae; clypeus as long as labrum, finely rough and sparsely setose; fronto-clypeal suture narrow; surface of frons and

vertex rough and sparsely setose; eyes large, oval in lateral view and convex in dorsal view, with margins raised.

Thorax. Pronotum slightly wider than long, widest in basal half, black; PL in ♂♂ (0.63 – 0.74 mm, \bar{S} = 0.67 ± 0.04), in ♀♀ (0.65, 0.69 mm); PW in ♂♂ (0.68 – 0.76 mm, \bar{S} = 0.71 ± 0.04), in ♀♀ (0.68, 0.74 mm); AP in ♂♂ (0.49 – 0.54 mm, \bar{S} = 0.52 ± 0.02), in ♀♀ (0.51, 0.57 mm); lateral margins explanate; anterior angles produced; ante-



Figs 124–131. 124–127 *Graphelmis strbaki* sp.nov.: 124) aedeagus lateral view; 125) aedeagus ventral view; 126) spiculum gastrale and sternite 9; 127) ovipositor; 128–131 *Graphelmis reitteri* sp.nov.: 128) aedeagus lateral view; 129) aedeagus ventral view; 130) spiculum gastrale and sternite 9; 131) ovipositor. Scale bars: 0.1mm.

rior sublateral tubercles fine; posterior tubercles carinate, reaching posterior margin; median groove deep; lateral margins of groove raised; prebasal admedian pits indistinct; surface plicate-microreticulate, with a few tiny, short setae on tubercles and margins of groove. Prosternum: prosternal process parallel-sided; lateral margins almost flat; posterior margin with long median protuberance; surface of prosternum finely plicate-microreticulate. Scutellum subtriangular, flat; surface at least in posterior half micropunctured. Mesosternum impressed mesally, with indistinct prebasal transverse carinae; surface microreticulate. Metasternum about twice as long as mesosternum, almost flat; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture depressed about in posterior two-thirds (depression narrow in females, wider in males); almost entire surface covered by plastron structures; anterior margin and mesal portion along suture finely rough; disc of males admedially with flattened yellow setae. Elytra with sides subparallel in anterior two-thirds, then continuously converging toward finely produced apices; EL in ♂♂ (1.56 – 1.79 mm, \bar{S} = 1.63 ± 0.08), in ♀♀ (1.62, 1.65 mm); lateral margins explanate and serrate; striae punctures well impressed; interval 3 raised anteriorly; entire interval 5 finely raised; interval 7 finely raised in 0.5 – 0.75; elytral surface finely plicate; intervals with sparse short setae. Legs: femora finely microreticulate; tibiae glabrous in anterior half and microreticulate in posterior half; FT in ♂♂ (0.54 – 0.62 mm, \bar{S} = 0.58 ± 0.03), in ♀♀ 0.56 mm; MT in ♂♂ (0.51 – 0.62 mm, \bar{S} = 0.56 ± 0.03), in ♀♀ (0.53, 0.54 mm); metatibiae of males (Fig. 167); HT in ♂♂ (0.59 – 0.68 mm, \bar{S} = 0.63 ± 0.03), in ♀♀ (0.59, 0.60 mm); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process flat; narrow mesal portion of process and ventrites microreticulate; admedian and lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination slightly produced posteriad; admedian setae yellow and long. Sternite 9 and spiculum gastrale (Fig. 126).

Aedeagus (Figs 124, 125). Penis slender; in lateral view curved, with base produced ventrad; base with arched carina; in ventral view straight, very slender, basally abruptly widened with apex acuminate; membranous endophallus with three weak sclerites; phallobasis short, almost 0.25× as long as penis.

Ovipositor (Fig. 127) with terminal segment slender and finely curved; preterminal segment about 3.75× as long as terminal, outer side finely concave; distal sclerite subquadrate, about 0.66× as long as preterminal; basal segment about 1.27× as long as preterminal and distal sclerites combined; ventral fulcrum almost straight.

Sexual dimorphism. Males are distinguished by widened and incised metatibial apices and flattened setae on disc of metasternum.

Distribution. So far known only from Irian Jaya (Indonesia).

Etymology. Named for old friend of senior author

Matej Štrbák, enthusiastic nature lover from Bratislava, Slovakia.

***Graphelmis reitteri* sp.nov.**

(Figs 115, 128–131, 168)

Type locality: IRIAN JAYA: Nabire dist. Nabire, Kali Bobo 5m.

Material examined. Holotype ♂ (NMW): “IRIAN JAY: Nabire dist. Nabire, Kali Bobo 5m, IV.1998 leg. M. Balke”.

Paratypes (NMW): 1 ♂, 3 ♀♀ with the same label as holotype.

Diagnosis. Within the *G. picta* species group, *G. reitteri* sp.nov. differs as follows: 1) raised lateral margins of pronotal median groove parallel; 2) elytral apices distinctly produced; 3) median longitudinal suture depressed in almost whole metasternal length; 4) male metatibiae not incised only slightly curved and constricted subapically; 5) apical spine of male metatibiae inconspicuous; 6) penis in lateral view straight, except distinctly curved base; 7) prebasal elytral yellow spots fused medially.

Description. Body form elongate (Fig. 115); CL in ♂ 2.34 mm, in ♀♀ 2.49, 2.51 mm; EW in ♂ 0.93 mm, in ♀♀ 0.94, 0.96 mm; CL/EW in ♂ 2.52, in ♀♀ 2.60, 2.67.

Colour pattern: pronotum with paler anterior margin; elytra with prebasal, mesally fused spots and pair of curved subapical spots.

Head. HW in ♂ 0.47 mm, in ♀♀ 2.26, 2.46 mm; ID in ♂ 0.26 mm, in ♀♀ 0.25, 0.26 mm; ED in ♂ 0.21 mm, in ♀♀ 0.21 mm; HW/ID in ♂ 1.78, in ♀♀ 1.89, 2.00. Labrum micropunctured; punctures with long pale setae; interstices shiny; anterior half paler. Clypeus about as long as labrum; lateral portions microreticulate; mesal portion glabrous; surface sparsely micropunctured; punctures setigerous; fronto-clypeal suture narrow; surface of frons and vertex densely irregularly plicate-micropunctured and sparsely setose; eyes large, oval in lateral view and convex in dorsal view, with margins raised.

Thorax. Pronotum slightly wider than long, widest posteriorly of middle; PL in ♂ 0.65 mm, in ♀♀ 0.72, 0.75 mm; PW in ♂ 0.74 mm, in ♀♀ 0.75, 0.78 mm; AP in ♂ 0.53 mm, in ♀♀ 0.56 mm; lateral margins explanate; anterior angles produced; anterior sublateral tubercles fine; posterior tubercles carinate, almost reaching posterior pronotal margin; median groove large; lateral margins of groove raised, almost carinate; prebasal admedian pits absent; surface irregularly plicate-micropunctured, with sparse tiny setae mainly on tubercles and margins of groove. Prosternum: prosternal process with sides parallel; lateral margins raised, microreticulate; posterior margin with wide median protuberance; surface finely plicate-microreticulate. Scutellum subtriangular, flat; surface shiny with a few small punctures. Mesosternum impressed mesally; surface microreticulate. Metasternum about twice as long as mesosternum, almost flat; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture depressed in almost whole length (depression narrow in females, wider in males); almost entire surface covered by

plastron structures; anterior margin and mesal portion along suture finely rugulose; disc of males admedially with flattened yellow setae. Elytra with sides parallel in anterior two-thirds, then continuously converging toward distinctly produced apices; EL in ♂ 1.69 mm, in ♀ 1.76 mm; lateral margins explanate and serrate; striae punctures finely impressed; interval 3 raised anteriorly; entire interval 5 finely raised; interval 7 almost flat; elytral surface finely plicate; intervals with yellow setae. Legs: femora microreticulate; tibiae finely longitudinally grooved; FT in ♂ 0.65 mm, in ♀ 0.62, 0.65 mm; MT in ♂ 0.65 mm, in ♀ 0.62, 0.63 mm; metatibiae of males (Fig. 168); HT in ♂ 0.69 mm, in ♀ 0.68, 0.69 mm; length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process almost flat; narrow mesal portion of process and ventrite 1 microreticulate; mesal portion of remaining ventrites glabrous; admedian and lateral portions of ventrites covered by plastron structures; apex of ventrite 5 deeply emarginate, microreticulate; sides of apical emargination distinctly produced. Sternite 9 and spiculum gastrale (Fig. 130).

Aedeagus (Figs 128, 129). Penis slender; in lateral view almost straight except distinctly ventrally produced base; in ventral view straight, subparallel; membranous endophallus with three weak sclerites; phallobasis short, about 0.22× as long as penis.

Ovipositor (Fig. 131) with terminal segment slender and almost straight; preterminal segment about 3.7× as long as terminal, outer side concave; distal sclerite subquadrate, about half as long as preterminal; basal segment about 1.35× as long as preterminal and distal sclerites combined; ventral fulcrum finely curved.

Sexual dimorphism. Males are well distinguished by widened and constricted metatibial apices and yellow setae on disc of metasternum.

Distribution. So far known only from Irian Jaya (Indonesia).

Etymology. Named in honour of coleopterologist Edmund Reitter.

Graphelmis togianica sp.nov.

(Figs 116, 132–135, 169)

Type locality: “SULAWESI, Togian Islands Pulau Batadaka, riv. in for. nr. Walcai.

Material examined. Holotype ♂ (NMW): “SULAWESI, Togian Islands Pulau Batadaka, 9.8.1987 riv. in for. nr. Walcai leg. Bilton”. **Paratypes** (NMW, CKB): 13♂♂, 14♀♀, 1ex. (sex not examined) with the same label as holotype; 22♂♂, 8♀♀: “N-SULAWESI 1992 Gunung Ambang NSG (13) leg. Jäch 20.IV”; 2♂♂: “N-SULAWESI 1992 Dumoga Bone NP/Torout (14) leg. Jäch 21.IV”; 1♀: “N-SULAWESI 1992 Dumoga Bone NP (20) Lombongo-Gorontalo leg. Jäch 24.IV”; 1♂: “N-SULAWESI 1992 Umg. Bantimurung NE U.P. (26) leg. Jäch 28.IV”; 1♂: “INDONESIA: N-Sulawesi ca. 8km SW Manado 30.1.1998, ca. 100m leg. J. Haft (AI 1).

Diagnosis. Within the *G. picta* species group, *G. togianica* sp.nov. differs as follows: 1) dorsal surface matt;

2) body shape slightly widened; 3) raised edges of pronotal groove slightly paler; 4) elytral interval 3 distinctly raised in anterior 0.25; 5) entire elytral interval 5 distinctly carinate; 6) male metatibiae shallowly incised; 7) base of penis in lateral view only slightly produced ventrad; 8) legs yellow-brown; 9) head and disc of pro- and mesosternum microreticulate.

Description. Habitus (Fig. 116); CL in ♂♂ (2.07 – 2.46 mm, \bar{S} = 2.26 ± 0.13), in ♀♀ (2.18 – 2.47 mm, \bar{S} = 2.35 ± 0.10); EW in ♂♂ (0.87 – 1.06 mm, \bar{S} = 0.95 ± 0.07), in ♀♀ (0.91 – 1.00 mm, \bar{S} = 0.96 ± 0.03); CL/EW in ♂♂ (2.32 – 2.45, \bar{S} = 2.38 ± 0.05), in ♀♀ (2.39 – 2.47, \bar{S} = 2.44 ± 0.04).

Colour pattern: pronotum with anterior margin paler; elytra with prebasal spots, indistinct or reduced elongated admedian spots in middle and pair of subapical stripes on interval 5.

Head. HW in ♂♂ (0.43 – 0.50 mm, \bar{S} = 0.45 ± 0.03), in ♀♀ (0.44 – 0.50 mm, \bar{S} = 0.48 ± 0.02); ID in ♂♂ (0.22 – 0.26 mm, \bar{S} = 0.25 ± 0.02), in ♀♀ (0.22 – 0.26 mm, \bar{S} = 0.25 ± 0.01); ED in ♂♂ (0.18 – 0.21 mm, \bar{S} = 0.19 ± 0.01), in ♀♀ (0.19 – 0.22 mm, \bar{S} = 0.21 ± 0.01); HW/ID in ♂♂ (1.76 – 1.93, \bar{S} = 1.83 ± 0.07), in ♀♀ (1.88 – 2.00, \bar{S} = 1.92 ± 0.05). Labrum paler; anterior half yellowish; surface finely microreticulate with long pale setae. Clypeus about as long as labrum; surface microreticulate with short setae; fronto-clypeal suture narrow; surface of frons and vertex rough, with short setae; eyes large, oval in lateral view and convex in dorsal view, with margins raised.

Thorax. Pronotum wider than long, widest in basal third to half; PL in ♂♂ (0.63 – 0.72 mm, \bar{S} = 0.67 ± 0.03), in ♀♀ (0.68 – 0.74 mm, \bar{S} = 0.72 ± 0.02); PW in ♂♂ (0.72 – 0.84 mm, \bar{S} = 0.76 ± 0.04), in ♀♀ (0.74 – 0.84 mm, \bar{S} = 0.81 ± 0.04); AP in ♂♂ (0.50 – 0.59 mm, \bar{S} = 0.53 ± 0.03), in ♀♀ (0.53 – 0.57 mm, \bar{S} = 0.56 ± 0.02); lateral margins distinctly explanate; anterior angles produced; anterior sublateral tubercles fine; posterior tubercles carinate, reaching posterior margin; median groove large; lateral margins of groove raised; prebasal admedian pits fine; surface plicate-microreticulate, with sparse tiny setae. Prosternum: prosternal process with sides parallel; lateral margins slightly raised; posterior margin with wide median protuberance; surface finely microreticulate. Scutellum wider than long, suboval, flat; surface except glabrous anterior margin microreticulate. Mesosternum impressed mesally; sides of disc convex in cross-section; surface microreticulate. Metasternum about twice as long as mesosternum; admedian prebasal punctures absent; sublateral carinae absent; median longitudinal suture depressed about in posterior half; almost entire surface covered by plastron structures; anterior margin glabrous; mesal portion along suture finely microreticulate or almost glabrous; disc of males admedially with sparse longer setae. Elytra with sides subparallel in anterior two-thirds, then continuously converging toward very slightly produced or almost rounded apices; EL in ♂♂ (1.44 – 1.74 mm, \bar{S} = 1.58 ± 0.10), in ♀♀ (1.50 – 1.74 mm, \bar{S} = 1.63 ± 0.08); lateral margins explanate and serrate; striae punctures well impressed;

interval 3 distinctly raised in anterior 0.25, then continuously flattened posteriad; entire interval 5 carinate; interval 7 slightly carinate in 0.5–0.75; surface densely irregularly micropunctured; intervals with sparse short setae. Legs: femora microreticulate; tibiae finely longitudinally

grooved; FT in ♂♂ (0.49–0.59 mm, $\bar{S}=0.55 \pm 0.04$), in ♀♀ (0.53–0.59 mm, $\bar{S}=0.56 \pm 0.02$); MT in ♂♂ (0.47–0.59 mm, $\bar{S}=0.53 \pm 0.05$), in ♀♀ (0.51–0.56 mm, $\bar{S}=0.54 \pm 0.02$); metatibiae of males (Fig. 169); HT in ♂♂ (0.53–0.65 mm, $\bar{S}=0.59 \pm 0.04$), in ♀♀ (0.56–0.63



Figs 132–138. 132–135 *Graphelmis togianica* sp.nov.: 132) aedeagus lateral view; 133) aedeagus ventral view; 134) spiculum gastrale and sternite 9; 135) ovipositor; 136–138 *Graphelmis jesusi* sp.nov.: 136) aedeagus lateral view; 137) aedeagus ventral view; 138) spiculum gastrale and sternite 9. Scale bars: 0.1mm.

mm, $\bar{S} = 0.60 \pm 0.03$); length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process finely depressed mesally; narrow mesal portion of process and ventrites 1, 2 and 5 microreticulate; mesal portion of ventrites 3, 4 almost glabrous; admedian and lateral portions of ventrites covered by plastron structures; ventrite 5 with sides of apical emargination slightly produced posteriad; admedian setae moderately dense. Sternite 9 and spiculum gastrale (Fig. 134).

Aedeagus (Figs 132, 133). Penis slender; in lateral view curved with base slightly produced ventrad; in ventral view straight, subparallel; membranous endophallus with three sclerites; phallobasis short, almost 0.24× as long as penis.

Ovipositor (Fig. 135) with terminal segment slender and almost straight; preterminal segment about 3.9× as long as terminal, outer side concave; distal sclerite subquadrate, almost half as long as preterminal; basal segment about 1.3× as long as preterminal and distal sclerites combined; ventral fulcrum finely sinuate.

Sexual dimorphism. Males are distinguished by widened and incised metatibial apices and longer setae on disc of metasternum.

Distribution. So far known only from Sulawesi (Indonesia).

Etymology. Named in reference to the geographical distribution.

***Graphelmis jesusi* sp.nov.**

(Figs 117, 136–138, 170)

Type locality: IRIAN JAYA: Kabup. Nabire Wandammen penins. Wondiwoi-Mts., 6h from Yeretua, 560m.

Material examined. Holotype ♂ (NMW): “IRIAN JAYA: Kabup. Nabire Wandammen penins. Wondiwoi-Mts., 29.-0.7.1998 6h from Yeretua, 560m leg. M. Balke (WA9)”.

Paratypes: 1 ♀ (NMW) with the same label as holotype.

Diagnosis. Within the *G. picta* species group, *G. jesusi* sp.nov. resembles *G. togianica* sp.nov., from which differs in: 1) longer penis; 2) pronotal median longitudinal groove deeper; 3) legs dark; 4) metasternum shallowly plicate; 5) elytral intervals 3 and 5 more distinctly raised.

Description. Habitus (Fig. 117); CL in ♂ 2.87 mm, in ♀ 2.72 mm; EW in ♂ 1.21 mm, in ♀ 1.09 mm; CL/EW in ♂ 2.38, in ♀ 2.50.

Colour pattern: pronotum with paler anterior margin; elytra with weak yellowish prebasal spots and pair of small yellowish transverse subapical spots.

Head. HW in ♂ 0.57 mm, in ♀ 0.53 mm; ID in ♂ 0.29 mm, in ♀ 0.26 mm; ED in ♂ 0.21 mm, in ♀ 0.22 mm; HW/ID in ♂ 1.95, in ♀ 2.00. Labrum black; anterior two thirds punctured, punctures with long pale setae; posterior third finely microreticulate to glabrous. Clypeus about as long as labrum; anterior half microreticulate and setose; posterior half rough; fronto-clypeal suture depressed; frons

and vertex rough and sparsely setose; eyes large, oval in lateral view and convex in dorsal view, with margins raised.

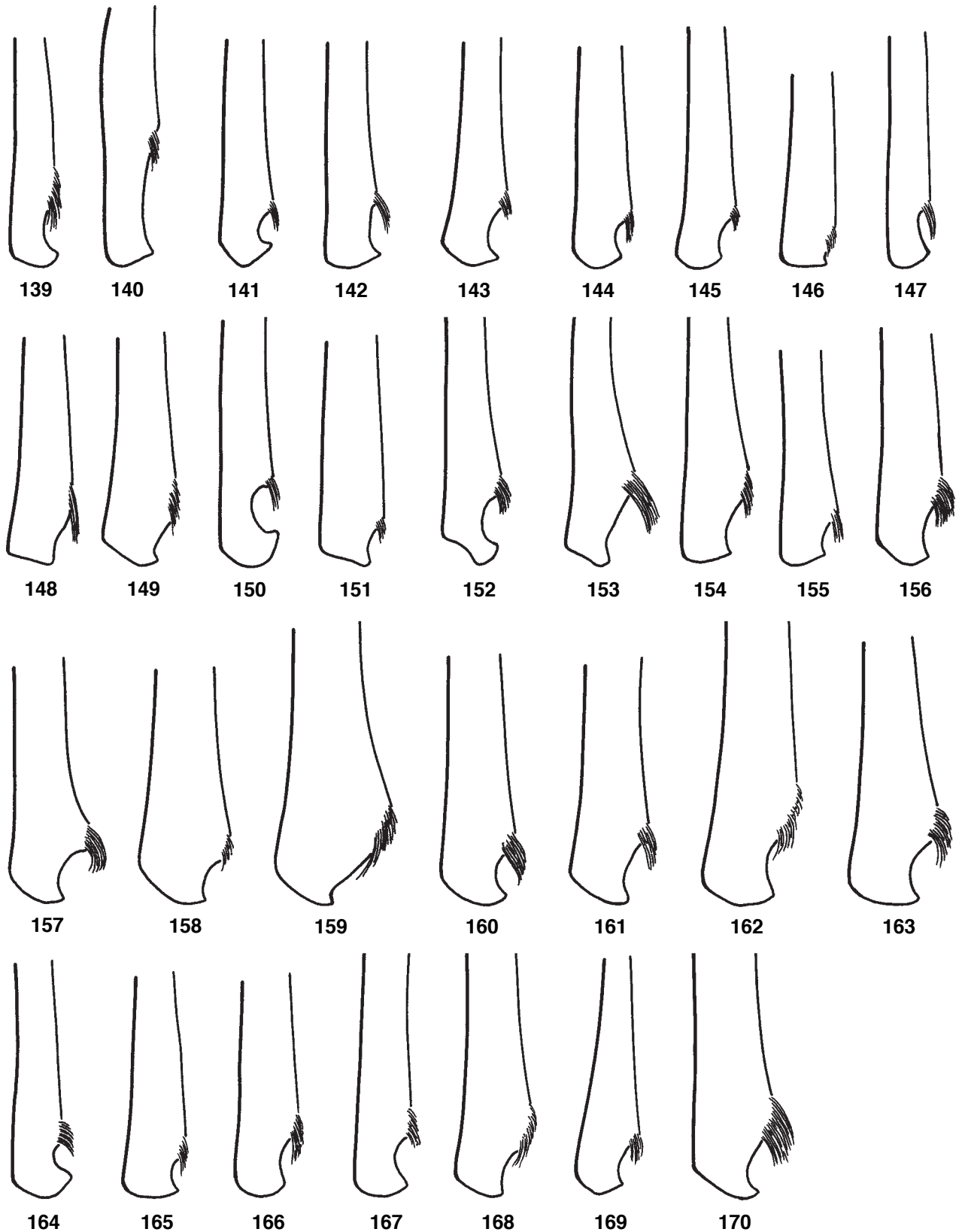
Thorax. Pronotum slightly wider than long, widest posteriorly of middle; PL in ♂ 0.90 mm, in ♀ 0.84 mm; PW in ♂ 0.97 mm, in ♀ 0.88 mm; AP in ♂ 0.68 mm, in ♀ 0.63 mm; lateral margins explanate; anterior angles produced; anterior sublateral tubercles fine; posterior tubercles carinate, reaching posterior pronotal margin; median groove large, with raised lateral margins; prebasal admedian pits small; surface densely irregularly plicate-micropunctured, with sparse tiny setae especially on tubercles and margins of groove. Prosternum: prosternal process with sides parallel; lateral margins raised, microreticulate; posterior margin with well projected median protuberance; surface plicate. Scutellum subtriangular, flat; surface rough. Mesosternum impressed mesally, surface microreticulate; posterior half with fine plications. Metasternum about twice as long as mesosternum, sides somewhat convex in cross-section; transverse suture impressed admedially; sublateral carinae absent; median longitudinal suture depressed in posterior 0.75; sides of disc finely irregularly grooved; almost entire surface covered by plastron structures; area between mesocoxae and mesal portion along suture rough; disc of males with sparse flattened yellow setae; disc of females with sparse tiny setae admedially. Elytra with sides parallel in anterior 0.6, then continuously converging toward slightly produced apices; EL in ♂ 1.97 mm, in ♀ 1.88 mm; lateral margins explanate and serrate; stria punctures well impressed; interval 3 raised in anterior 0.2; entire interval 5 carinate; interval 7 feebly raised in 0.6 – 0.8; elytral surface rough; intervals with tiny short setae. Legs finely microreticulate; FT in ♂ 0.71 mm, in ♀ 0.65 mm; MT in ♂ 0.71 mm, in ♀ 0.62 mm; metatibiae of males slightly widened preapically and then incised; apical spine acuminate (Fig. 170); HT in ♂ 0.76 mm, in ♀ 0.71 mm; length of tarsomere 5 equal to combined length of tarsomeres 1–4.

Abdomen. Admedian keels of ventrite 1 absent; abdominal intercoxal process depressed mesally; process and disc of ventrites densely irregularly micropunctured; lateral portions of ventrites covered by plastron structures; apex of ventrite 5 emarginate, sides of apical emargination produced posteriad (more distinctly in males). Sternite 9 and spiculum gastrale (Fig. 138).

Aedeagus (Figs 136, 137). Penis slender; in lateral view slightly curved in anterior 0.4; base finely produced ventrad; in ventral view sides subparallel, slightly widened toward base; membranous endophallus with three sclerites; phallobasis short, about 0.23× as long as penis.

Ovipositor with terminal segment slender and almost straight; preterminal segment about 3.7× as long as terminal, outer side concave; distal sclerite subquadrate, about half as long as preterminal; basal segment about 1.35× as long as preterminal and distal sclerites combined; ventral fulcrum finely curved.

Sexual dimorphism. Males are well distinguished by widened and incised metatibial apices and longer yellow setae on disc of metasternum. Apex of ventrite 5 deeper



Figs 139–170 Apex of male metatibia of: 139) *G. picta* (REITTER); 140) *G. pallidipes* (CARTER); 141) *G. kubani* sp.nov.; 142) *G. palawanensis* sp.nov.; 143) *G. bruneica* sp.nov.; 144) *G. jendeki* sp.nov.; 145) *G. gibberosa* sp.nov.; 146) *G. philemoni* sp.nov.; 147) *G. darwini* sp.nov.; 148) *G. basalis* sp.nov.; 149) *G. hlavaci* sp.nov.; 150) *G. convexa* sp.nov.; 151) *G. tuberculata* sp.nov.; 152) *G. securipes* sp.nov.; 153) *G. schneideri* sp.nov.; 154) *G. oxytela* JÄCH; 155) *G. ceylonica* (MOTSCHULSKY); 156) *G. loebli* sp.nov.; 157) *G. vogleri* sp.nov.; 158) *G. balkei* sp.nov.; 159) *G. clava* sp.nov.; 160) *G. riberai* sp.nov.; 161) *G. picea* sp.nov.; 162) *G. verpa* JÄCH; 163) *G. diaphoroderes* JÄCH; 164) *G. lomata* JÄCH; 165) *G. posoica* sp.nov.; 166) *G. insolita* sp.nov.; 167) *G. strbaki* sp.nov.; 168) *G. reitteri* sp.nov.; 169) *G. togianica* sp.nov.; 170) *G. jesusi* sp.nov.

emarginate, with sides of apical emargination more produced posteriad in males.

Distribution. So far known only from Irian Jaya (Indonesia).

Etymology. Named for good friend and entomologist Jesus Gomez Zurita from Palma de Mallorca.

Acknowledgements

We wish to thank Manfred A. Jäch (Vienna) for useful comments on the manuscript. Alan Mill is acknowledged for the review of english language. This study was partly supported by the Slovak Scientific Grant Agency, Projects No. 1/0114/03 and 1/3110/03.

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Manuscript received: 15. 2. 2004