The genus *Paracyphocrania* Redtenbacher, 1908 (Phasmatodea: Phasmatinae: Phasmatini)

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The little-known monotypic genus *Paracyphocrania* Redtenbacher, 1908 (Phasmatinae: *Phasmatini*) is reviewed and now comprises two species: *P. lativentris* Redtenbacher, 1908, and *P. tecticollis* (Redtenbacher, 1908) **comb. nov.**, which are redescribed and illustrated. A neotype is designated for *P. lativentris* which is newly recorded from Sulawesi.

Introduction

While examining the phasmid material deposited in the Nationaal Natuurhistorisch Museum, Leiden (RMNH), the authors came across an unidentified female *Phasmatini* from Central Sulawesi, subsequently identified as belonging to the monotypic genus *Paracyphocrania* Redtenbacher, 1908.

Paracyphocrania lativentris Redtenbacher, 1908 was described in the third part of the well known monograph "Die Insektenfamilie der Phasmiden" (1906-1908) by C. Brunner v. Wattenwyl (1907) and J. Redtenbacher (1906 & 1908). The original description was based on a unique female but unfortunately the exact depository and locality of the specimen were unknown to Redtenbacher. The holotype has not subsequently been traced in any European museum, and hence presumed lost. Neither the characterization of the genus nor the original description of *P. lativentris* are sufficiently detailed. However, the specimen in RMNH matches so well with the characters given by Redtenbacher that there can be no doubt it belongs to *Paracyphocrania* Redtenbacher and represents the only known species, *P. lativentris* Redtenbacher. These circumstances justify a redescription of Redtenbacher's genus and designation of a neotype for *P. lativentris* Redtenbacher. Further research showed the so far unknown male of *Paracyphocrania* to have been described from the Philippines by Redtenbacher (1908) himself in the genus *Vasilissa* Kirby, 1896.

The diverse but not apparently rich phasmid fauna of Sulawesi is still poorly known. The most recent publication on the island's fauna, which included the description of new taxa and a catalogue of recorded species, is that of Hennemann (1997). *Paracyphocrania lativentris* Redtenbacher, 1908 is a new record for Sulawesi and undoubtedly amongst the most striking representatives of the island's Phasmatodea. In addtion to *Phasma gigas* (Linné, 1758) and *Phasma marosensis* Hennemann, 1997, it is the third representative of the tribe *Phasmatini* to be known from the island. According to

the catalogue of Phasmatodea of Sulawesi provided by Hennemann (1997) the number of represented genera increases to 36 and the number of recorded species to 72.

Abbreviations

MNHN: Museum National d'Histoire Naturelle, Paris / France.
RMNH: Nationaal Natuurhistorisch Museum, Leiden / Netherlands.

Paracyphocrania Redtenbacher, 1908

Type-species: *Paracyphocrania lativentris* Redtenbacher, 1908: 466, by monotypy.

Paracyphocrania Redtenbacher, 1908: 466; Brock & Hasenpusch, 2001: 5; Otte & Brock, 2005: 246.
Vasilissa, Redtenbacher, 1908: 383, pl. 22: 6 (in part); Otte & Brock, 2003: 370 (in part)

Diagnosis.— ♂, ♀: Small to medium (body length < 15.0 cm), rather slender (♂♂) to very massive (♀♀), green *Phasmatini*, with a short mesothorax, long tegmina and fully developed alae. Head indistinctly longer than wide, unarmed, vertex strongly rounded and convex (♀♀) or flat (♂♂). No ocelli. Antennae longer than head and pronotum combined, antennomeres strongly shortened. Mesothorax gradually widening towards posterior margin, less than 1.5× longer than head and pronotum combined. Mesonotum tectiform, sparsely tuberculate. Meso- and metasternum simple. Tegmina large, oval, projecting over posterior margin of median segment (♂♂) or tergite II (♀♀). Alae well developed, at least reaching tergite VI; anal region yellowish or orange with bold blackish brown markings. Abdomen cylindrical; segments II-VI parallel-sided, almost quadrangular (♀♀) or distinctly longer than wide ♂♂). Tergites VI-X of ♂♂ with a median carina; V and VI of ♀♀ without lateral lobes or expansions. Anal segment of ♀♀ with an impressed median line, posterior margin rounded; of ♂♂ strongly tectiform and with a rounded posteromedial excavation. Supraanal plate triangular and tectiform in ♂♂, very indistinct in ♀♀. Cerci laterally compressed, apically truncate and at best half as long as anal segment. Subgenital plate of ♀♀ lanceolate, projecting over anal segment by combined length of tergites IX-X; tapered, apex pointed. Poculum of ♂♂ indistinct, scoop-like, reaching about half way along tergite IX. Legs short and stout, meso- and metafemora trapezoidal, tibiae triangular in cross-section, dorsal carinae of latter strongly converging. Meso-, metafemora and mesotibiae with a distinct sub-apical tooth on posterodorsal carina. All ventral carinae of mid- and hind legs minutely serrate. Ventral surfaces of meso- and metafemora with a row of minute spines. Mesobasitarsus shorter than following three tarsomeres combined.

Diagnosis of the eggs.— Large (capsule length 5.2 mm), capsule longer than high, oval in cross-section with a blunt bulge on dorsal and ventral surfaces, and across polar end. Capsule surface slightly rugulose. Micropylar plate long, almost reaching from polar-area to operculum, slightly broadened posteriorly; open internally. Operculum flat, oval and with a small capitulum on a short stalk.

Differentiation.— Closely related to *Phasma* Lichtenstein, 1796 (Type -species: *Phasma empusa* Lichtenstein, 1796, = *Gryllus* (*Mantis*) *gigas* Linné, 1758) but easily distinguished by: the short, not conspicuously elongated and foliaceous cerci; lack of ocelli

and tectiform mesonotum of both sexes. Furthermore, ♀♀ differ by the lack of lateral lobes on tergites V-VI and the distinctly elongated, lanceolate subgenital plate; ♂♂ by the longitudinal median keel of abdominal tergites III-X and much smaller, less bulgy poculum. The egg shows resemblance to that of *Phasma marosensis* Hennemann, 1997 but is distinct by having the capsule more laterally compressed and surrounded by a blunt keel on the dorsal and ventral surfaces, and across polar area.

Redtenbacher (1908: 466) distinguished *Paracyphocrania* from *Phasma* Lichtenstein, 1796 by the simple apical spines of the tibiae, the short and broad mesonotum, long lanceolate subgenital plate and short ovate cerci. Two further genera of *Phasmatini* are typified as having shortened cerci but both are restricted to Australia, this is *Cigarrophasma* Brock & Hasenpusch, 2001 (Type-species: *Cigarrophasma tessellata* Brock & Hasenpusch, 2001) and *Onchestus* Stål, 1875 (Type-species: *Lopaphus gorgus* Westwood, 1859). From *Cigarrophasma* it differs by: the unarmed head; smooth body surface (except for tubercles of the mesonotum); tectiform mesonotum of both sexes; the lack of lateral lobes on tergites VII-VIII and pointed, lanceolate subgenital plate of ♀♀. Eggs are distinct by the laterally compressed and keeled capsule. From *Onchestus* it is readily distinguished by: the unarmed head; smooth body surface (except for tubercles of the mesonotum); tectiform mesonotum and different pattern of the alae of both sexes; elongate and lanceolate subgenital plate of ♀♀ and lack of bulgy, longitudinal keels of the egg capsule.

In general appearance ♀♀ show striking similarity to those of *Platycrana* Gray, 1835 (subfamily Platycraninae) perhaps the reason why the RMNH specimen was found amongst a series of *Platycrana viridana* (Olivier, 1792). *Platycrana* Gray is however not closely related and clearly separated from *Paracyphocrania* by: the broader body, not tectiform mesonotum and plain hyalinous anal region of the alae of both sexes; smooth body surface, laterally expanded mesonotum and abdominal tergites as well as the elongated and filiform gonapophyses of ♀♀; and small, cylindrical cerci and produced vomer of ♂♂. Furthermore, the eggs of *Platycrana* Gray lack a dorsoventral bulge and have the micropylar plate with conspicuous L-shaped lateral exapansions and closed internally.

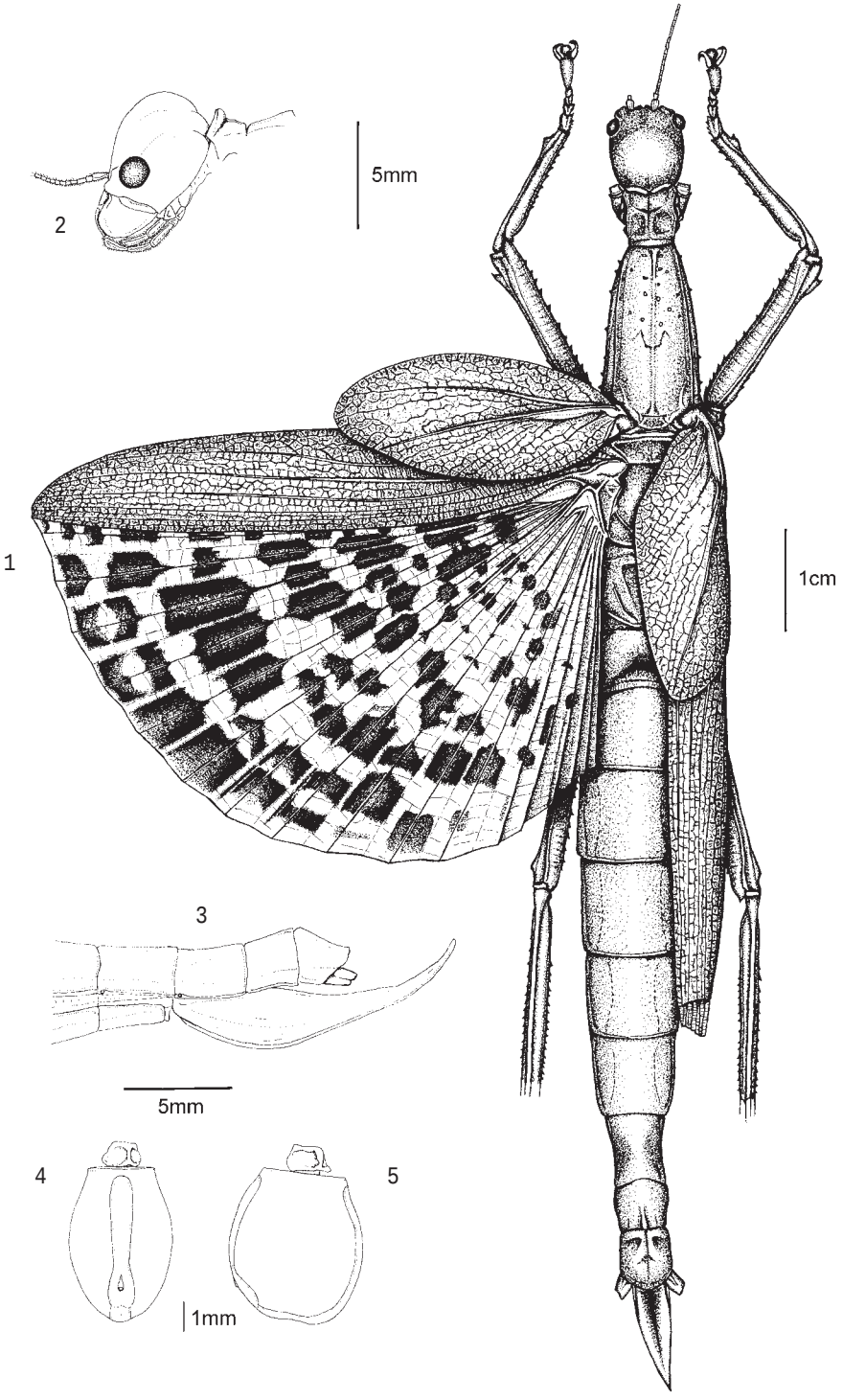
Distribution.— Sulawesi & Philippines.

Species included.— 1. *Paracyphocrania lativentris* Redtenbacher, 1908: 466. [Central Sulawesi]. 2. *Vasilissa tecticollis* Redtenbacher, 1908: 383, pl. 22: 6 (♂). [Philippines]

Paracyphocrania lativentris Redtenbacher, 1908
(figs 1-5)

Paracyphocrania lativentris Redtenbacher, 1908: 466. Holotype, ♀: locality unknown (lost). Neotype, ♀ [here designated]: Indonesia: C. Sulawesi nr. Luwuk, Salodik c. 400 m, 1.-14. XI. 1989, Mal. Trap 14b, RMNH, C. van Achterberg (RMNH); Brock & Hasenpusch, 2001: 5; Otte & Brock, 2005: 246.

Differentiation.— The second *Paracyphocrania* species, *P. tecticollis* (Redtenbacher, 1908) comb. nov., from the Philippines, is only known from the ♂, therefore a satisfactory complementary description is hard to provide. However, the comparatively small size, relatively longer mesothorax, less tectiform mesonotum and only known record in Central Sulawesi indicate *P. lativentris* Redtenbacher to be a distinct species, rather than representing the ♀ of *P. tecticollis* (Redtenbacher).


2
5mm
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1cm
3
5mm
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1mm

Description.— Redtenbacher's (1908: 466) original description of the type-species *P. lativentris* is very brief: "Viridiflafescens, unicolor. Alarum area postica lutescens, nigrotessellata. Meso- et metsternum tuberculata, margine laterali denticulato.".

Below is a detailed description of the neotype ♀ in RMNH. Although quite recently collected the insect is rather incomplete and has suffered badly from damage by parasites. Apart from three legs being glued, it lacks the following extremities: both fore legs, complete left and most parts of the right antenna, apical parts of the metatibiae and metatarsi. Due to former conservation in ethanol the original colouration has strongly faded and changed to pale yellow. Certainly the insect was bright green when alive.

♀ Neotype (figs 1-3).— Rather small (body length 120.0 mm, including subgenital plate 130.0 mm) and broad *Phasmatini* (maximum body width at abdominal tergite IV 12.5 mm) with the first five abdominal tergites strongly swollen, long tegmina (28.5 mm), fully developed alae (59.0 mm) and a long, lanceolate subgenital plate (29.5 mm). Body surface smooth except for a number of granules and tubercles on meso- and metathorax. General colouration of body and legs more or less uniformly yellowish brown (presumably bright green when alive), the pronotum, anterior and posterior sections of the mesonotum as well as the metanotum and median segment mid brown (due to preservation). Tegmina and costal region of alae pale yellow (believed to be green when alive). Bases of alae reddish brown, anal region orange with irregular, bold blackish brown markings. The outer ones larger and roughly arranged in radial rows.

Head.— Large, almost 1.5× longer than wide, entirely smooth; vertex strongly swollen, convex. Eyes prominent, greyish brown, circular, convex and projecting hemispherically from head capsule. Antennae mid brown, at least reaching posterior margin of pronotum (broken in the unique specimen). Scapus less than 2× longer than wide, with ledge-like lateral dilations and distinctly constricted towards base. Pedicellus cylindrical, as long as wide. Following antennomeres strongly shortened, about 2× longer than wide and slightly constricted towards their bases.

Thorax.— Pronotum distinctly shorter and narrower than head, slightly longer than wide, anterior margin strongly concave and with a raised transverse carina; posterior margin slightly convex and transverse. Median transverse depression distinct and curved, not reaching lateral margins of segment, median line impressed. Mesothorax strongly constricted at anterior margin and gradually widening towards posterior margin. Mesonotum slightly narrowing towards anterior margin, 2.5× longer than wide, strongly convex and covered with several rounded tubercles in anterior half of segment; median line distinctly raised. Mesopleurae with a distinct longitudinal median keel which bears 3-4 slightly pointed tubercles in the anterior half. Mesosternum with several rounded granules, ± placed in two parallel, longitudinal rows. Metasternum like mesosternum, metapleurae with a few minor granules near ventrolateral

◀ Figs 1-5. *Paracyphocrania lativentris* Redtenbacher, 1908, Neotype, ♀
1. Neotype, ♀ (RMNH), dorsal view (partly reconstructed).
2. Head (lateral view).
3. Terminal abdominal segments (lateral view, subgenital plate partly reconstructed).
4. Egg (dorsal view).
5. Egg (lateral view).

margin. Tegmina large, slightly projecting over posterior margin of tergite II, oval and with a very distinctly raised radial vein. Alae well developed, reaching to posterior margin of tergite VI.

Abdomen.— Median segment almost of equal length as metanotum. Tergite II quadrate, III-VII indistinctly longer than wide, II-IV widening towards posterior margin, V-VII indistinctly narrowing, IV broadest. All tergites with a slightly impressed and concave longitudinal line near lateral margins. Sternites smooth. Tergite VIII slightly shorter but distinctly narrower than VII, strongly convex, medially constricted and almost 2× longer than wide. IX slightly raised posteromedially, ± quadrate, distinctly shorter than previous. Anal segment almost as long as VIII with impressed median line, posterior margin rounded, lateral margins slightly truncate. Cerci brown, 1/3 the length of anal segment, laterally compressed and with a rounded median carina, posterior margin truncate. Subgenital plate convex, prominently keeled, lanceolate and strongly tapered towards a pointed apex; projecting over apex of anal segment by combined length of tergites IX and X (10.0 mm).

Legs.— All relatively short and stout, all ventral carinae of mid and hind legs serrate, medioventral carina of meso- and metafemora distinct and armed with a row of 6 (mesofemora) to 9 (metafemora) spines. Posterodorsal carina of of meso- and metafemora with a distinct triangular apical tooth and a few smaller serrations near base. Anterodorsal carina smooth except for a few minute serrations near base. Dorsal carinae of meso- and metatibiae smooth, posterodorsal carina of mesotibiae with a broad triangular apical tooth. Mesobasitarsus slightly shorter than following three tarsomeres combined, dorsal carina slightly raised towards apex. Ventral carinae with a few very minute teeth.

Egg (figs 4 & 5).— Two eggs were extracted from the abdomen of the ♀ in RMNH. Thus, care should be taken when using the following description as several structures may not be fully developed. The terminology used for the following description follows Clark-Sellick (1997).

Large, capsule longer than high, laterally compressed and surrounded by a blunt bulge on dorsal and ventral surfaces, and across polar end. Capsule surface slightly rugulose. General colouring of capsule pale brown, operculum mid brown, keel and micropylar plate creamish straw, capitulum reddish brown. Micropylar plate very elongate, parallel-sided and almost extending from operculum to polar-area; slightly dilated at micropylar cup. Micropylar cup near posterior end of plate. Posterior end connected with a micropylar plate-like structure which runs from the polar-area almost the the operculum. This makes the plate appear to surround the complete egg capsule. Operculum oval and very slightly convex. Capitulum of moderate size, irregularly hat-shaped with several prominent impressions and a very short, constricted stalk.

Measurements (in mm).— length 5.2, length (including capitulum) 6.0, width 2.8, heigth 4.9, length of micropylar plate 4.7.

Comments.— In his original description, Redtenbacher (1908: 466) stated: "Die Notizen über Fundort und Sammlung sind durch einen unglücklichen Zufall vernichtet worden [The notes on locality and deposition have unfortunately been destroyed]". This leaves no doubt that Redtenbacher had not seen the specimen himself, and based his description on notes by Brunner v. Wattenwyl only, which is the case with several other taxa described in part one or three of the monograph by Redtenbacher (1906,

Table 1. Measurements of *Paracyphocrania* spp.

Measurements [mm]	***P. lativentris*** Holotype, ♀ (lost)*	Neotype, ♀ (RMNH)	***P. tecticollis*** Holotype, ♂ (MNHN)
Body (incl. subgen. pl.):	140.0	130.0	-
Body:	-	120.0	107.0
Head:	-	12.2	4.7
Pronotum:	-	6.8	3.8
Mesonotum:	23.0	18.0	12.1
Metanotum:	22.0**	9.1	7.9
Median segment:	-	9.2	9.7
Tegmina:	35.0	28.5	19.8
Alae:	65.0	59.0	69.5
Profemora:	34.0		-
Mesofemora:	-	21.2	24.5
Metafemora:	35.0	28.0	29.5
Protibiae:	-		-
Mesotibiae:	-	20.7	25.3
Metatibiae	-	> 28.0	27.8
Antennae:	-	> 13.5	> 30.0

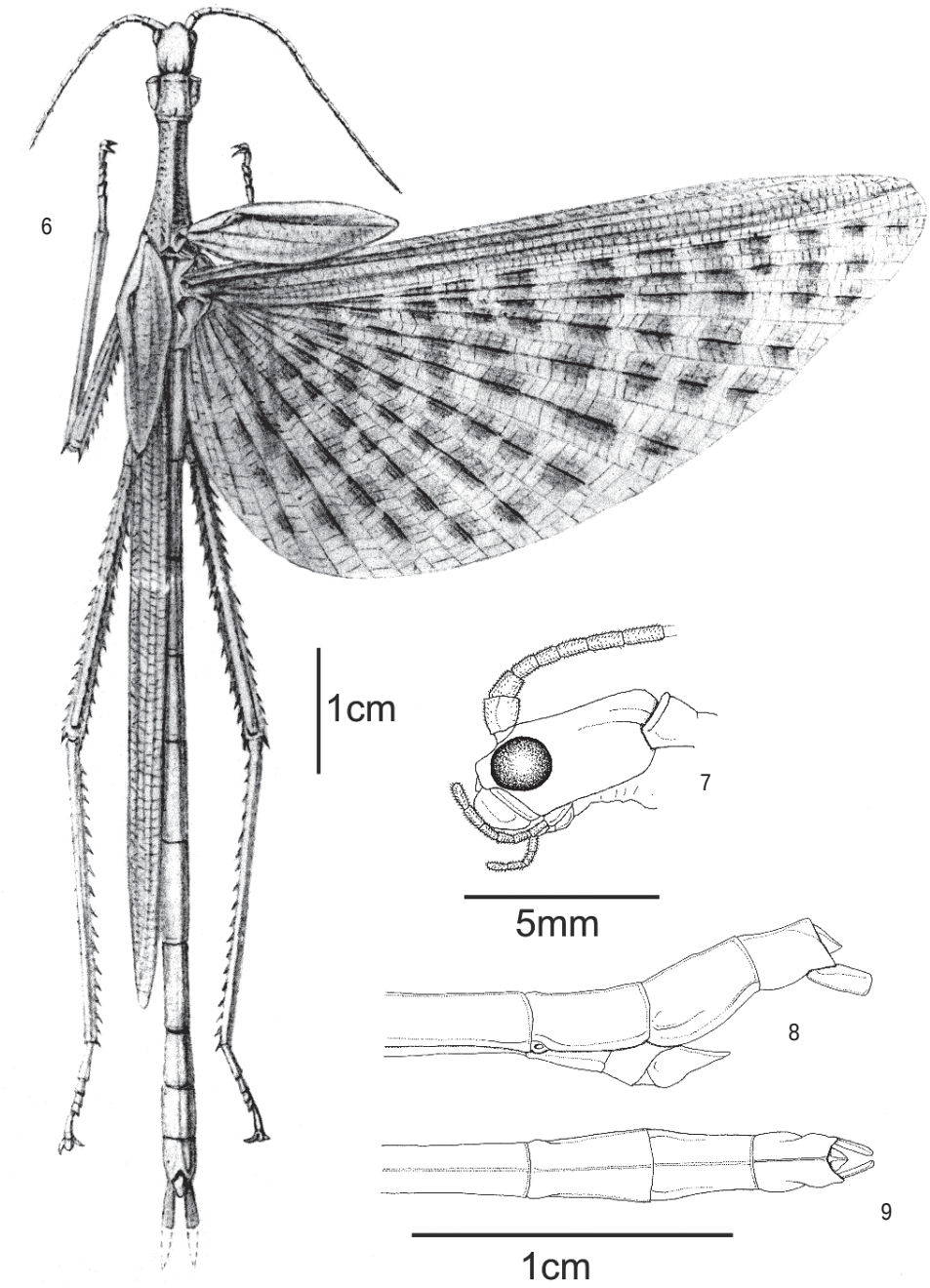
* according to Redtenbacher (1908 : 466)
** including the median segment

1908). Although Redtenbacher did not state the holotype was lost, the specimen has so far not been traced. Brock & Hasenpusch (2001: 5) as well as Otte & Brock (2005: 246) stated the holotype to be lost. Due to it being a rather large and striking insect it is very unlikely to have been overlooked during all of the extensive searches in European museum collections conducted by several recent authors (e.g. Brock, Conle, Hennemann & Zompro). Unfortunately, Redtenbacher's original description of the genus and characterization of the single included species, *Paracyphocrania lativentris*, are rather brief, but the ♀ in RMNH from Central Sulawesi matches very well with Redtenbacher's original description except for being slightly smaller (130.0 mm instead of 140.0 mm given by Redtenbacher for the holotype, → see table 1) and having the tubercles of the mesosternum slightly less distinct. Furthermore, the metafemora of the holotype are seen to be about 25% longer than in the neotype (35.0 mm compared to 28.0 mm), but other cases have already shown Redtenbacher's measurements to be not always accurate. Therefore, the RMNH ♀ is here designated as the neotype of *P. lastiventris* and serves to provide a new diagnosis of the genus *Paracyphocrania* as well as a detailed redescription and illustration of its type-species.

Paracyphocrania tecticollis (Redtenbacher, 1908) comb. nov.
(figs 6-9)

Vasilissa tecticollis Redtenbacher, 1908: 383, pl. 22: 6 (♂). Holotype, ♂: Museum Paris, Philippines, Type, 136. *Vasilissa tecticollis* Redt. n. sp. (Type !) (MNHN); Otte & Brock, 2005: 339.

Differentiation.— *P. lativentris* Redtenbacher is only known from a rather damaged



Figs 6-9. *Paracyphocrania tecticollis* (Redtenbacher, 1908), Holotype, ♂
6. Holotype, ♂ (MNHN), dorsal view (reproduced from Redtenbacher, 1908, plate 22 : 6).
7. Head (lateral view).
8. Terminal abdominal segments (lateral view).
9. Terminal abdominal segments (dorsal view).

♀ from Central Sulawesi and *P. tecticollis* only from a unique ♂. Thus it is difficult to provide a satisfying complementary description, but the large size (if compared to the ♀ of *P. lativentris*), relatively shorter mesothorax, more prominently tectiform mesonotum and distribution indicate *V. tecticollis* Redtenbacher to be a distinct species, rather than representing the ♂ of *P. lativentris* Redtenbacher.

Description.— The ♂ holotype lacks both forelegs, the left mid leg and great parts of the antennae. Due to former conservation in ethanol the original colouration has strongly faded and changed to yellow. Certainly the insect was bright green when alive. Although the cerci are complete, Redtenbacher (1908: 383) erroneously stated they were broken and partly missing (indicated as broken in Redtenbacher's illustration → see Fig. 6).

♂ Holotype (figs 6-9).— Medium sized (body length 107.0 mm), moderately robust *Phasmatini* with long, lanceolate tegmina (19.8 mm) and fully developed alae (69.5 mm). Mesothorax densely and roughly granulose, remaining parts of thorax less distinctly and abdominal sterna very minutely granulose. General colouration of body and legs plain yellow (due to preservation); antennae pale brown. Tegmina and costal region of alae yellow (believed to be green in life); tegmina with anterior margin dark brown and followed by a broad longitudinal white band; costal region of alae with a longitudinal white line running some 2/3 the way along alae and pink towards the base. Anal region of alae slightly yellowish, sub-transparent, with darker yellow veins and numerous more or less rectangular brown markings which become less distinct and finally disappear towards the base of the wing.

Head.— Sub-cylindrical, 1.5× longer than wide, broadest at eyes, vertex flat and with two longitudinal impressed dorsolateral lines. Eyes very large, hemispherical and prominently projecting from head capsule; pale orange brown. Antennae projecting over posterior margin of mesonotum (broken in the holotype). Scapus 1.5× times longer than wide, compressed dorsoventrally and constricted basally. Pedicellus cylindrical and about 2/3 the length of scapus. Following antennomeres increasing in length.

Thorax.— Pronotum about as long as head, slightly medially constricted, transverse median depression indistinct. Mesothorax 2× longer than pronotum, slightly medially constricted and widening towards posterior margin. Mesonotum distinctly tectiform and with a prominent, blunt median keel; complete surface densely granulose, with larger granules roughly placed in longitudinal rows. Meso- and metapleurae and sterna densely but minutely granulose. Tegmina elongate, lanceolate, apically tapered and almost reaching to posterior margin of median segment; with a small but pointed hump in basal third. Alae reaching half way along tergite VII.

Abdomen.— Segments II-VI cylindrical, VII very slightly widening towards the posterior; II-V smooth, VI-IX with a fine median carina. II-V increasing in length, II slightly less than 3×, V 3.5× longer than wide; V-VII of equal length. VIII about 2/3 the length of VII and gradually widening towards the posterior. IX strongly convex, parallel-sided, longer than VIII. Sternites II-VII very minutely granulose. Anal segment strongly tectiform with a slight triangular posteromedian excavation. Supraanal plate distinct and projecting over posterior margin of anal segment; triangular and distinctly tectiform. Poculum small, slightly convex, spoon-like and reaching about half way along tergite IX. Cerci about 2/3 the length of anal segment, strongly laterally flattened and more or less rectangular if seen in lateral aspect.

Legs.— Mesofemora reaching to posterior margin of median segment, hind legs almost reaching apex of abdomen. Ventral carinae of meso- and metafemora set with numerous minute teeth (less in number on anteroventral carinae); only a very few small teeth on dorsal carinae. Medioventral carina with a longitudinal row of minute spines. Dorsal carinae of meso- and metatibiae smooth. Ventral carinae of mesotibiae very indistinctly spinose. Ventral carinae of metatibiae densely set with minute, slightly needle-like teeth which gradually increase in size towards the apex of tibia and are lacking in the basal quarter of tibia. Basitarsi as long as remaining segments combined except claw, simple.

Comments.— When describing *Vasilissa tecticollis* from the Philippines, Redtenbacher (1908: 383) was uncertain about its generic position "Ob jedoch die Spezies tatsächlich hierher gehört, vermag ich nicht mit Bestimmtheit zu behaupten. [I am not able to confirm that this species really belongs here (in the genus *Vasilissa* Kirby, 1896)]". Comparison of the ♂ holotype of *Vasilissa tecticollis* Redtenbacher in MNHN with the type-species of *Vasilissa* Kirby, *V. walkeri* Kirby, 1896 from NW-Australia, has clearly shown *V. tecticollis* Redtenbacher not to be a member of *Vasilissa* Kirby, but to represent the second species and previously unknown ♂ of *Paracyphocrania* Redtenbacher, 1908.

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