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Revision of the genus *Wakarumbia* (Coleoptera: Lycidae)

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Abstract. A revision of the genus *Wakarumbia* Bocák, 1999 from Sulawesi is presented. Altogether 10 species are included in the genus *Wakarumbia*: the type species *W. gracilis* Bocák, 1999 is redescribed, a new combination of *Wakarumbia celebensis* (Kleine, 1933) is proposed (originally placed in *Protaphes* Kleine, 1926) and the following new species are described: *Wakarumbia brendelli* sp. n., *W. brunnescens* sp. n., *W. flavohumeralis* sp. n., *W. grandis* sp. n., *W. nigra* sp. n., *W. oculata* sp. n., *W. pallescens* sp. n. and *W. similis* sp. n. The important diagnostic characters are illustrated and all species are keyed. Relationship between species and ecological data are briefly discussed.

INTRODUCTION

The genus *Wakarumbia* was proposed for one species collected on Buton Island, near the south-east coast of Sulawesi (Bocák, 1999). This genus is closely related to *Hemiconderis* Kleine, 1926 with which it forms the subtribe Hemiconderina within the tribe Metriorrhynchini (Lycidae: Metriorrhynchinae). Thanks to M.J.D. Brendell and P.M. Hammond from the Natural History Museum, London, I was able to study the material collected in Northern Sulawesi during the Wallace Project organised in 1985 by the Royal Entomological Society of London (Knight, 1988). This material was collected by different methods and one of the main goals was to estimate insect diversity in this area and, therefore, the material was sorted by the staff of the Natural History Museum in London on the basis of the external morphology and colour patterns into morphospecies. It is now possible to compare this estimate with the real number of species. Additionally, studying Kleine's collection in Warsaw revealed a species belonging to the genus *Wakarumbia*, previously classified by Kleine (1933a, b) in *Protaphes* (Lycidae: Erotinae).

MATERIAL AND METHODS

All morphological measurements were made using the ocular grid of an Olympus SZX-12 binocular microscope. Data given in the paragraph "measurements" refer to the holotype (except *W. celebensis*), the sizes given in descriptions express the variability of specimens, when a series was available. Eye diameter was measured in lateral view and when the eye outline was not circular the diameter was measured at the widest point. The interocular distance when measured from above was the minimum distance between eyes. The ratios were calculated by dividing points measured by ocular grid and, therefore, they can differ from those obtained by division of data given in descriptions in millimetres. Line illustrations were derived from microphotographs produced by an Olympus DP-10 digital camera.

Depositories: BMNH – Natural History Museum, London; LMBC – author's collection; MIZW – Museum and Institute of Zoology PAN, Warszawa

Genus *Wakarumbia* Bocák, 1999

Type species: *W. gracilis* Bocák, 1999, by monotypy.

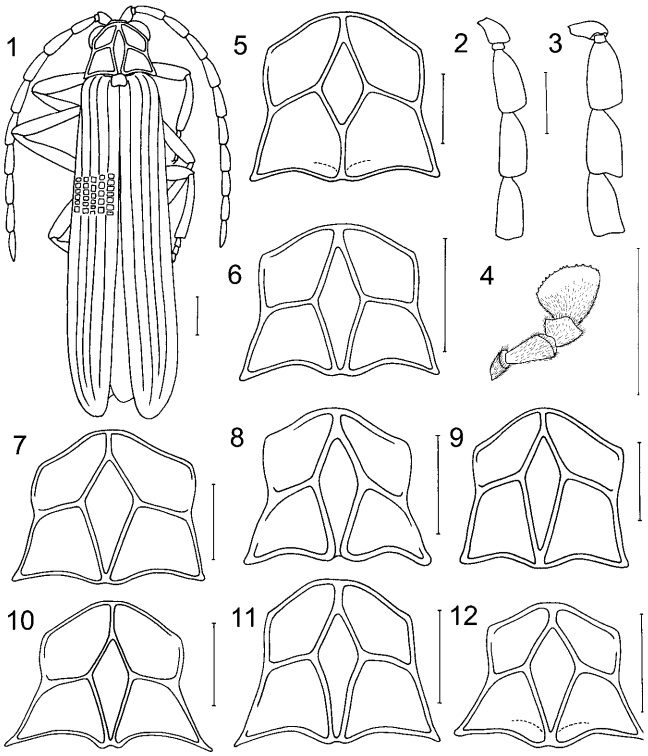
Redescription

Body small, slender (Fig. 1), head small, partly concealed by pronotum, antennae shorter than body, 11-segmented, segments 3–7 ventroapically emarginate, mouth parts small but fully developed, maxillary palpi 4-segmented, labial palpi 3-segmented, the last segment with projections (Fig. 4). Size of eyes sexually dimorphic. Pronotum with five areolae, median areola narrow, rhomboidal, costae straight, sharp and narrow (Figs 5–12). Elytra with four primary costae, costa 2 and 4 weaker, no secondary costae developed (Fig. 1). Male genitalia without paramerae, phallobase annuliform without any sclerotization of membrane, phallus simple with spine-like structure at the base of internal sac (Figs 13–27). Female genitalia as in Figs 28–29.

Differential diagnosis. The genus *Wakarumbia* differs from the remaining Metriorrhynchini genera in the fully developed primary elytral costae, the absence of secondary costae, the characteristic shape of phallus with unique complex spine-like structure in the basal part and the spermaduct attached to the characteristic pocket in the apical part of vagina (Figs 28–29). The closely related genus *Hemiconderis* Kleine, 1926 differs externally in having secondary elytral costae, a different arrangement of spines in male genitalia and a different shape of vagina (Bocák & Bocáková, 1990a). The taxa of the tribe Conderini have similar arrangement of pronotal costae but the relatively distant position of both groups is supported by numerous characters (Bocák & Bocáková, 1990b).

Distribution and relationship within genus

The genus *Wakarumbia* now comprises 10 closely related species known from a very restricted area of Northern Sulawesi (Dumonga-Bone National Park and Gunung Ambang Forest Reserve; 8 species), Southern Sulawesi (1 species collected at the end of last century) and from Buton Island (1 species). The closely related genus *Hemiconderis* is known from the Papuan Subregion only, and



Figs 1–13. 1 – general appearance of *Wakarumbia pallescens*. 2–3: Basal antennal segments of male. 2 – *W. pallescens*; 3 – *W. flavohumeralis*. 4 – maxillary palpus of *W. grandis*. 5–12: Pronotum. 5 – *W. celebensis*; 6 – *W. gracilis*; 7 – *W. grandis*; 8 – *W. pallescens*; 9 – *W. flavohumeralis*; 10 – *W. brunnescens*; 11 – *W. oculata*; 12 – *W. nigra*. Scales 0.5 mm.

taking into account the fact that some parts of Sulawesi have a common tectonic history with the northern part of New Guinea, the genus *Wakarumbia* very probably originated in the area of islands which form the geologically older part of the present Papuan Region (Hall & Blundell, 1996). The colour patterns correspond with those of the syntopically occurring species of the genus *Plateros* Bourgeois (Platerodini) but differ substantially from those of *Plateros* species from Great Sundas. I have frequently noted during field work geographically restricted Müllerian mimicry complexes in Lycidae and the *Wakarumbia* species belong to a group of Papuan mimicry complexes.

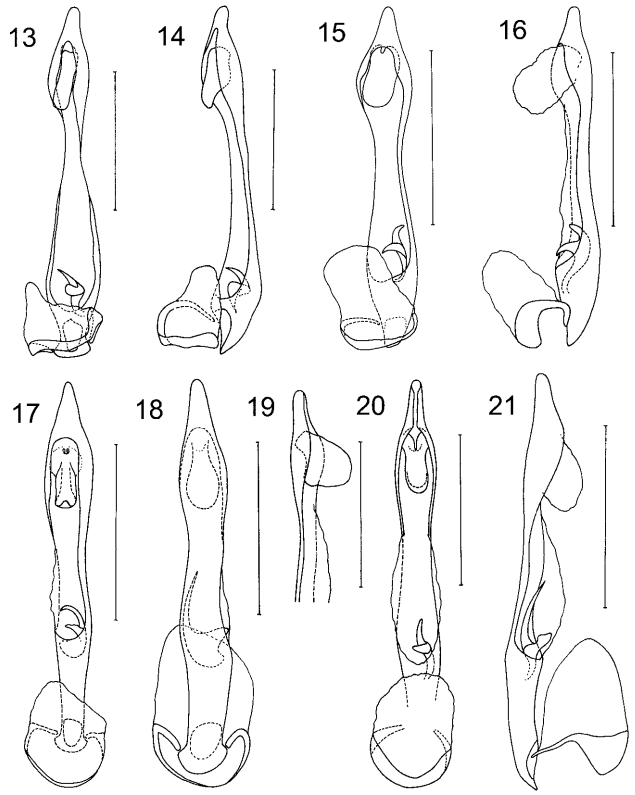
All species are very similar in external appearance and inconspicuously coloured. Small differences are found in the shape of the pronotum and the elytral reticulate cells, but both characters vary. The only reliable characters for identification and determining relationships are the shape of genitalia and size of the eyes in males. The primitive condition in the closely related genus *Hemiconderis*, as well as in whole tribe Metriorrhynchini, is the symmetrical shape of the male phallus without any rotation of the apical part. A unique asymmetry was found in several species of *Wakarumbia*. The base of the ventral opening of the phallus can be asymmetrical with an unrotated apical part as in *W. niger* (Figs 15–16) or the asymmetry of the basal part of opening can be more marked and accompanied by a distinct rotation of the apical part as in *W. pallescens* (Figs 22–23). There is a marked rotation of the phallus in *W. grandis* (Figs 25–26), *W. celebensis* Kleine (Fig. 24) and *W. flavohumeralis* (Fig. 27). The body colour pattern and the size of the eyes are variable in this group but are not similar to those in groups defined on the basis of male genitalia. A unique origin of the small eyes of the males in the group of darkly coloured species (*W. nigra*, *W. similis* and *W. grandis*) is improbable because this group includes species with both symmetrical and rotated male genitalia. Unfortunately, there are no other reliable characters because females, whose genitalia usually provide such characters, are unknown for many species.

Diversity and ecology

Most lycid species were collected individually or by sweeping of the lower tree strata of the tropical forest. The fauna of the higher strata is very poorly collected and generally large samples collected by quantitative methods are not available for most regions. The material described here indicates that only a small part of the diversity has been collected and that our knowledge can be substantially improved when new collecting methods are used. Only 6 specimens of the genus *Wakarumbia* are cited in the literature (Kleine, 1933a, Mroczkowski, 1959, Bocák, 1999) and no additional specimens are present in the visited European museums.

The expedition of the Royal Entomological Society of London (Project Wallace 1985: Knight, 1988) to the Northern Sulawesi province of Indonesia collected 27 specimens which were sorted by the staff of the Natural History Museum in London on the basis of external characters into 8 species. Closer examination based on male genitalia and the size of male eyes gave identical results in three species (all of them were represented by one specimen only), two species were split in two, and two species are lumped into one. In addition, the material included three females that belong to different not yet described species, one of them was originally designated a separate species by BMNH staff and two were excluded from the longer series of originally designated species. Although they can be distinguished from all known species by their colour patterns and minute external characters, I decided not to describe them as new species because of potential problems with their identification when more species are collected in the future. Altogether I recognised 11 species in this material, 8 of which are described in this article.

Many of the specimens bear labels with data about collecting methods and habitat; collecting method was available for 19 of 27 specimens. Although this information is very limited, it reveals something about the ecology of the group. The most successful method was a Malaise trap, which caught 11 specimens. This indicates a quite high flight activity. As 10 of the 11 specimens were females it is possible they were searching for oviposition sites. The remaining specimens were collected either on leaves (2♂, 1♀) or they were fogged from the high strata of the canopy (2♂, 3♀). No species for which a series of specimens was collected were taken exclusively by only one of these methods, therefore, I can not allocate individual species to the stratum categories used by Hammond et al. (1997)



Figs 13–21: Male genitalia. 13, 14 – *W. brunnescens*; 15, 16 – *W. nigra*; 17 – *W. similis*; 18 – *W. brendelli*; 19, 20 – *W. oculata*; 21 – *W. brendelli*. Scales 0.5 mm.

(tree crown specialist, stratum generalist or lower level specialist). It is very probable that adults of *Wakarumbia* species migrate between tree crowns and the lowest stratum, where they seek decaying wood, which is the larval habitat for most Lycidae.

Three species, *W. pallescens* and two undescribed females (altogether 9 specimens), were collected in lowland forest (200–400 m a. s. l.), the others (16 specimens) were collected in lower montane forests (980–1,400 m), and two specimens at a higher elevation (1,780 m, Gng. Muajat summit area). The species distribution supports the results presented by Stork & Brendell (1990). There is no overlap between the *Wakarumbia* fauna of the lowland and lower montane forest, and the highest diversity is found in the mid-altitude zone. The absolute number of specimens is highest in the mid-altitude habitats, but as I do not have any data on the total material collected at different elevations during the British expedition, no conclusion can be drawn from these data. My personal experience indicates that lycids are most common in Sumatra and Malaysia in the lower montane *Lithocarpus-Castanopsis* forests, and it is likely that a similar distribution occurs in Northern Sulawesi even though the species composition of the forests there is different.

KEY TO MALES OF THE GENUS *WAKARUMBIA*

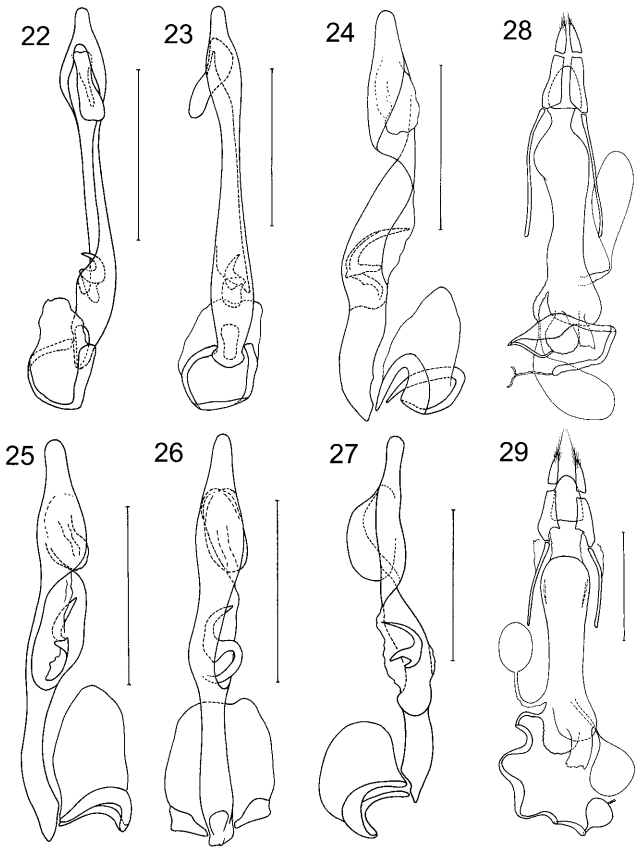
1 Whole elytra dark brown to black 2
– Elytra otherwise coloured, pale yellow, light brown or dark brown with yellow humeri 6
2 Head, thorax, and most of femora light brown, pronotum brown, phallus symmetrical (see Bocák, 1999) .... *W. gracilis* Bocák
– Whole body dark brown to black, only trochanters light brown 3
3 Male eye diameter at least 1.2 times the interocular distance, phallus slender, symmetrical, ventral opening reaching apex of phallus (Figs 19–20) ..... *W. oculata* sp. n.
– Male eye diameter considerably smaller than their minimum interocular distance 4
4 Apical part of phallus considerably rotated, body large, around 7 mm, very narrow margin of pronotum brown .... *W. grandis* sp. n.
– Apical part of phallus symmetrical or very slightly rotated (Figs 15–17), body smaller, 4.4–5.8 mm, pronotum completely dark brown to black 5
5 Basal part of phallus slender, phallus widest in basal third (Fig. 17) ..... *W. similis* sp. n.
– Basal part of phallus robust, widest in basal quarter (Figs 15–16) ..... *W. nigra* sp. n.
6 Whole elytra brown, light brown to pale yellow or at most apical one tenth of elytra slightly infuscated 7
– Humeral part of elytra lighter than rest, infuscated part always larger than light part 9
7 Meso- and metathorax light brown to yellow, phallus slender, basal part of opening distinctly asymmetrical, apical part rotated by 90 degrees (Figs 22, 23) .... *W. pallescens* sp. n.
– Meso- and metathorax brown to dark brown, phallus with basal part of opening symmetrical, apical part not rotated (Figs 13, 14, 18) 8
8 Basal part of phallus bulb-like, with opening reaching nearly the base of phallus (Figs 13, 14) .... *W. brunnescens* sp. n.
– Basal part of phallus parallel-sided, opening reaching basal third of length of phallus (Fig. 18) ..... *W. brendelli* sp. n.
9 Whole pronotum yellow, at least humeral quarter of elytra brightly yellow, with light-coloured elytral costae and dark bottom of reticulate cells reaching beyond the basal third of elytra, male eyes 1.67 times the minimum interocular distance, phallus as in Fig. 27 ..... *W. flavohumeralis* sp. n.
– Disc of pronotum infuscated, only small humeral part of elytra lighter, elytral costae and bottom of adjacent reticulate cells coloured identically, eye diameter in male equals to interocular distance, phallus as in Fig. 24 .... *W. celebensis* (Kleine)

Note. The species of the genus *Wakarumbia* differ mostly in the size of the eyes in males (they are uniform in females) and shape of male genitalia. The differences in colouration are insufficient in many cases for reliable identification. The characters available in both sexes were used in the key as far as possible, but some species had to be based on male characters only.

Wakarumbia brendelli sp. n.

Description

Male. Body small, slender, only very slightly widened posteriorly. Thorax: light brown pro- and mesothorax, distinctly darker brown metathorax, head brown with yellow antennal tubercles, mouth parts yellow, pronotum, scutellum and elytra except apex yellow, apical one fifteenth dark brown. Legs dark brown except trochanters and short bases of femora, abdomen dark brown. Head small, shining, with long pubescence, eyes large, hemispherically prominent, maximum eye diameter 1.34 times the interocular distance, antennal tubercles flat, antennae



Figs 22–29. 22–27: Male genitalia. 22, 23 – *W. pallescens*; 24 – *W. celebensis*; 25, 26 – *W. grandis*; 27 – *W. flavohumeralis*. 28–29: Female genitalia. 28 – *W. similis*; 29 – *W. pallescens*. Scales 0.5 mm.

strongly compressed, weakly serrate, longer than three quarters of elytral length. Pronotum trapezoidal, with pointed, slender posterior angles, 1.30 times wider than long. Scutellum bilobed at apex. Elytra flat, primary costa 2 much stronger over whole length, costa 4 stronger in basal two thirds only, reticulate cells transverse. Legs strongly compressed, slender, long. Male genitalia slender, with symmetrical basal part, very slightly rotated in apical part (Fig. 18).

Female. Unknown.

Differential diagnosis. *W. brendelli* differs from similar *W. pallescens* in the shape of male genitalia (compare Figs 18 and 22, 23) and transverse reticulate cells on elytra.

Measurements. Male. Length of body 6.1 mm, width at humeri 1.33 mm, length of pronotum 0.87 mm, width of pronotum 1.13 mm, interocular distance 0.39 mm, maximum diameter of eyes 0.52 mm.

Type material. Holotype, ♂, "Indonesia, Sulawesi Utara, Gng. Ambang F. R. nr. Kotamobagu, Feb. 1985, lower montane forest 1200–1400 m, on plants" (BMNH).

Etymology. The name "brendelli" is a patronym in honour of M.J.D. Brendell (London).

Distribution. Northern Sulawesi.

Wakarumbia brunnescens sp. n.

Description

Male. Body small, slender, only very slightly widened posteriorly. Thorax brown, distinctly lighter pro- and mesothorax, head dark brown, only frontal part slightly lighter, pronotum, scutellum and elytra light brown with elytra slightly infuscated at apex. Head small, shining, with long pubescence, eyes large, hemispherically prominent, maximum eye diameter 1.19–1.39 times the interocular distance. Antennae longer than three quarters of elytral length, strongly compressed, segments parallel-sided. Pronotum trapezoidal, 1.38 times wider than long, with acutely projected hind angles (Fig. 10). Scutellum flat, bilobed at apex. Elytra flat, parallel-sided, with primary costae 2 and 4 strong over whole length, costae 1 and 3 shortened, in apical part interrupted or considerably weakened in some parts. Legs slender, strongly compressed. Male genitalia slender, with robust basal part and with very narrow ventral bridge (Figs 13, 14).

Female. Interocular distance 1.03 times longer than maximum eye diameter.

Differential diagnosis. *W. brunnescens* is the only lightly coloured species other than *W. pallescens* and *W. brendelli*. In this species the colouration of the pronotum and elytra varies between light and moderately dark shades of brown, but it is never clearly yellow as in *W. pallescens* and *W. brendelli*, and the male genitalia of *W. brunnescens* differ substantially in shape (Figs 13, 14) from those in the other species.

Measurements. Male. Length of body 6.2 mm, width at humeri 1.38 mm, length of pronotum 0.92 mm, width of pronotum 1.28 mm, interocular distance 0.40 mm, maximum diameter of eyes 0.47 mm.

Type material. Holotype, ♂, "Indonesia, Sulawesi Utara, Fog 25, G. Ambang F. R. 1200 m, 31. vii. 85, Tray 10" (BMNH); paratypes: ♂, "Indonesia, Sulawesi Utara, Danau Moat, 1200 m, nr Kotamobagu, Oct. 1985"; ♀, "Indonesia, Sulawesi Utara, G. Ambang F. R., lower montane forest, 1300 m, malaise trap, 7–18 May 1985"; ♂, "Indonesia, Sulawesi Utara, G. Ambang F. R. Feb. 18. ii. 1985, Fog 7, tray 4" (BMNH, LMBC).

Etymology. The specific name refers to the brown colouration of the dorsum of its body.

Distribution. Northern Sulawesi.

Wakarumbia celebensis (Kleine, 1933) comb. n.

Protaphes celebensis Kleine, 1933a: 2.

Description

Male. Body medium sized, slightly dilated posteriorly. Thorax light brown, head brown, pronotum light brown with infuscated patch in middle of disc and slightly darkened pronotal carinae, elytra dark brown, only small humeral part slightly lighter, but transition between lighter and darker part very gradual and unclear. Abdomen dark brown, legs with pale trochanters and basal half of femora and dark rest of femora, tibiae and tarsi. Head small, shining, antennal tubercles small but followed by shallow transverse depression, eyes relatively large, hemispherically prominent, interocular distance equal to maximum eye diameter, antennae longer than three quarters of ely-

tral length, weakly serrate. Pronotum trapezoidal, 1.22 times wider than long, with median areola connected with basal margin through costa (Fig. 5), basal angles only slightly prominent, disc shining, covered with short pubescence. Scutellum flat, bilobed at apex, densely pubescent. Elytra slender, flat, with primary costa 2 and 4 strong in whole length, costae 1 and 3 much weaker, but only very slightly shorter, transverse costae dense, forming distinctly transverse elytral cells. Legs strongly compressed, slender. Male genitalia slender, apical part rotated by 360 degrees against base of phallus (Fig. 24).

Female. Unknown.

Differential diagnosis. *W. celebensis* is the only species in the genus in which the diameter of eyes in the male is equal to the interocular distance, has a light brown pronotum and very small, light humeri compared with the dark elytra. An advanced structure of male genitalia of *W. celebensis* indicates a close relationship with *W. grandis* and *W. flavohumeralis* (Figs 25–27).

Measurements. Paratype, ♂. Length of body 7.1 mm, width at humeri 1.49 mm, length of pronotum 1.19 mm, width of pronotum 1.35 mm, interocular distance 0.50 mm, maximum diameter of eyes 0.50 mm.

Type material. Paratype, ♂, "Sud Celebes, Bantimoeroeng, C. Ribbe, 1883" (MIZW).

Distribution. Southern Sulawesi.

Remark. *Wakarumbia celebensis* was described by Kleine (1933a) in the genus *Protaphes* Kleine, 1926 (Taphina, Erotinae) on the basis of the shape of pronotal fields. Kleine did not dissect the genitalia the structure of which places this species in the subfamily Metriorrhynchinae.

Wakarumbia flavohumeralis sp. n.

Description

Male. Body small, slender, parallel-sided. Prothorax and mesothorax light brown, metathorax, head, abdomen and legs except trochanters and bases of femora distinctly darked. Pronotum and scutellum yellow, humeral quarter of elytra bright yellow, with light coloured elytral costae and dark bottom of the reticulate cells in more than humeral third of elytra, rest of elytra dark brown.

Head small, shining, with sparse long pubescence, antennal tubercles small, flat but followed by distinct transverse depression. Eyes very large, hemispherically prominent, maximum eye diameter 1.67 times interocular distance. Antennae strongly compressed, weakly serrate (Fig. 3). Pronotum trapezoidal, only 1.11 times wider at base than long at midline, with nearly rectangular hind angles (Fig. 9). Scutellum flat, densely pubescent, deeply bilobed at apex. Elytra slender, flat, with primary costa 2 and 4 strong over whole length, costae 1 and 3 much weaker, but only very slightly shorter, transverse costae dense, forming apparently transverse elytral cells. Legs slender, strongly compressed. Male genitalia slender with rotated apical part of phallus (Fig. 27).

Female. Unknown.

Differential diagnosis. *W. flavohumeralis* belongs, according to the male genitalia, to the group of advanced species along with *W. grandis* and *W. celebensis*. It differs from them in the distinctly larger eyes in the male and the colouration of pronotum and elytra.

Measurements. Male. Length of body 6.3 mm, width at humeri 1.71 mm, length of pronotum 0.98 mm, width of pronotum 1.11 mm; interocular distance 0.33 mm, maximum diameter of eyes 0.55 mm.

Type material. Holotype, ♂, "Indonesia, Sulawesi Utara, Dumonga-Bone N. P. Site 12, High Casuarina, for. J.D. Holloway, 2.–3. ii. 1985" (BMNH).

Etymology. This species is named after the colour pattern on its elytra.

Distribution. Northern Sulawesi.

Wakarumbia gracilis Bocák, 1999

Redescription

Male. Body small, slender, yellow to brown, only elytra and antennae dark brown, individual parts of body tend to be infuscate to a variable extent, especially basal part of pronotum except margin and costae, tibiae and femora in apical part and tarsi. Head small, shining, with sparse, short pubescence, antennal tubercles inconspicuous, frons flat to slightly concave, eyes hemispherically prominent, diameter of eyes 1.24–1.30 times the distance between them, head including eyes slightly wider than frontal margin of pronotum, maxillary palpi slender, apical segment compressed, wider, obliquely cut at apex, labial palpi short, apical segment wide, cut at apex, apical margin with 4–6 tubercle-shaped projections. Antennae not longer than three fifths of the length of elytra, compressed, covered with dense, dark pubescence. Disc of pronotum shining, with sparse pubescence. Pronotal carinae forming narrow rhomboidal areola in middle of the disc. Scutellum longer than wide, flat, deeply emarginate at apex, densely pubescent. Elytra very slightly widened posteriorly, with four completely developed primary costae, costa 2 and 4 strong over whole length, costa 1 and 3 much weaker, stronger and shining at humeri only, very weak and even occasionally interrupted posteriorly, transverse costae well developed, areolae mostly quadrate. Legs apparently flattened, trochanters long, slender, without any projections. Male genitalia slender, symmetrical, quite robust at base and narrowed in middle, internal sac indistinct, without setae or pigmentation.

Female. Vagina long, with very short and indistinct median sac. Paired glands attached in middle part of vagina. Interocular distance 1.03 times maximum eye diameter.

Differential diagnosis. *W. gracilis* is easily distinguishable by the body colouration from the other species of the genus. The symmetrical structure of the male genitalia indicates a basal position in this genus along with *W. niger* and a close relationship to *W. brunnescens*.

Measurements. Male. Length of body 4.6 mm, width at humeri 0.88 mm, length of pronotum 0.62 mm, width of pronotum 0.76 mm, interocular distance 0.36 mm, maximum diameter of eyes 0.29 mm.

Type material. Holotype, ♂, "Sulawesi SE, Buton Island, Wakarumba, 3.–7. ii. 1994, M. Štrba and I. Jeniš lgt."; paratypes ♂ and ♀, same locality data as holotype (LMBC).

Distribution. Buton Isl.

Wakarumbia grandis sp. n.

Description

Male. Body medium sized, slender, slightly widened posteriorly. Whole body dark brown to black, only trochanters, basal part of femora, mandibles, bases of palpi and very narrow outer margins of pronotum lighter brown. Head small, shining, with small antennal tubercles and shallow transverse depression behind them, eyes small, hemispherically prominent, interocular distance 1.15 times greater than maximum eye diameter. Antennae strongly compressed, antennal segments robust, segment 3 only 1.65 times longer than wide, antennae as long as half of elytral length. Pronotum trapezoidal, 1.23 times 3/4 at base than maximum length, with prominent hind angles (Fig. 7). Scutellum deeply bilobed at apex, shining, with dense, short pubesce. Elytra flat, with strong primary costae 2 and 4 and much weaker costae 1 and 3, transverse costae dense, forming reticulate cells twice as wide as long, costae with fine, short setae. Legs slender, strongly compressed. Male genitalia slender, apical part of phallus strongly rotated (Figs 25, 26).

Female. Unknown.

Differential diagnosis. *W. grandis*, *W. similis*, *W. oculata* and *W. nigra* are the only species with completely dark brown to black dorsal part of body. *W. grandis* has the largest body and differs in the strongly rotated apical part of phallus (Figs 25, 26), the long tubular basal part of phallus, and the slender and distinctly transverse elytral reticulate cells.

Measurements. Male. Length of body 7.5 mm, width at humeri 1.53 mm, length of pronotum 1.05 mm, width of pronotum 1.29 mm; interocular distance 0.54 mm, maximum diameter of eyes 0.44 mm.

Type material. Holotype, ♂, "Indonesia, Sulawesi Utara, Gng. Ambang F. R., nr. Kotamobagu, 19–25 Mar. 1985; Lower montane forest 1200–1300 m" (BMNH).

Etymology. The specific name "grandis" refers to its being the largest species in the genus.

Distribution. Northern Sulawesi.

Wakarumbia nigra sp. n.

Description

Male. Body small, parallel-sided to slightly widened posteriorly. Whole body dark brown to black, only mouth parts, trochanters and bases of femora lighter. Head small, shining, antennal tubercles flat, eyes small, but hemispherically prominent, interocular distance 1.25–1.28 times maximum eye diameter. Antennae longer than two thirds of elytral length, strongly compressed, antennal segments nearly parallel-sided. Pronotum trapezoidal, 1.24 times wider than long, with acutely projected hind angles (Fig. 12). Scutellum, flat, bilobed at apex, shining. Elytra with equal strength of longitudinal costae in humeral half. Primary costae slightly shortened, costae 1 and 3 weaker in apical part, transverse costae less dense and reticulate cells quadrate. Legs long, slender, strongly compressed. Male genitalia with basal part of phallus bulb-like (Figs 15, 16).

Female. Interocular distance 1.31–1.36 times maximum eye diameter.

Differential diagnosis. *W. nigra* belongs to the group of dark species and differs in having quadrate reticulate cells and a robust symmetrical phallus (Figs 15, 16). It differs from the very similar *W. similis* in the shape of the male genitalia, bulb-like at base rather than slender (Fig. 17).

Measurements. Male. Length of body 5.55 mm, width at humeri 1.09 mm, length of pronotum 0.78 mm, width of pronotum 0.97 mm; interocular distance 0.41 mm, maximum diameter of eyes 0.32 mm.

Type material. Holotype, ♂, "Indonesia, Sulawesi Utara, Gng. Ambang F. R., nr. Kotamobagu, 19–25 Mar. 1985; Lower montane forest 1200–1300 m" (BMNH); paratypes: ♂, ♀, same locality data (collected in copula); 2♀, same locality data but 2.–18.v.1985, Malaise trap; ♀, same locality data but Mar. 1985, on leaves (BMNH, LMBC).

Etymology. The specific name refers to the black colouration of the body.

Distribution. Northern Sulawesi.

Wakarumbia oculata sp. n.

Description

Male. Body small, slender, nearly parallel-sided. Whole body dark brown to black, only trochanters, mouth parts and very narrow margins of pronotum brown to light brown. Head small, shining, sparsely pubescent, antennal tubercles well developed, with a shallow transverse depression behind them, eyes large, hemispherically prominent, maximum eye diameter 1.36 times interocular distance, antennae slender, weakly serrate, longer than two thirds of elytral length. Pronotum trapezoidal, 1.28 times wider than long (Fig. 11), disc only slightly shining, rather densely pubescent. Scutellum bilobed at apex, parallel-sided, slightly shining. Elytra with strong primary costae 2 and 4, much weaker and in apical third often interrupted costae 1 and 3, elytral reticulate cells slightly transverse. Legs slender, strongly compressed. Male genitalia bulb-like at base, symmetrical (Figs 19, 20).

Female. Unknown.

Differential diagnosis. *W. oculata* is similar to other dark species but differs in males that have much bigger eyes and in the shape of their phallus (Figs 19, 20).

Measurements. Male. Length of body 6.35 mm, width at humeri 1.30 mm, length of pronotum 0.89 mm, width of pronotum 1.14 mm; interocular distance 0.36 mm, maximum diameter of eyes 0.50 mm.

Type material. Holotype, ♂, "Indonesia, Sulawesi Utara, Gng. Ambang F. R., nr. Kotamobagu, 30. v.–2. June 1985, Gng. Muajat, summit area, ca 1780 m" (BMNH).

Etymology. The specific name "oculata" refers to the very large eyes of males.

Distribution. Northern Sulawesi.

Wakarumbia pallescens sp. n.

Description

Male. Body small, slender, parallel-sided to slightly widened posteriorly (Fig. 1). Whole body pale yellow, only abdomen and very apex of elytra dark brown, anten-

nae slightly infuscate. Head small, shining, sparsely pubescent, antennal tubercles flat, with no transverse depression behind them, eyes large, hemispherically prominent, maximum eye diameter 1.43 times interocular distance. Antennae slightly serrate, strongly compressed, longer than three quarters of elytral length. Pronotum trapezoidal, 1.24 times wider than long, median areola attached directly to basal margin (Fig. 8), hind angles sharp, but not acutely projected, disc of pronotum shining. Scutellum deeply emarginate at apex. Elytra with strong costae 2 and 4, slightly shortened costae 1 and 3, reticulate cells mostly quadrate. Male genitalia slender, with asymmetrical basal part, apical half rotated (Figs 22, 23).

Female. Interocular distance 1.09 times maximum eye diameter. Female genitalia with slender long vagina and bulbous spermatheca (Fig. 29).

Differential diagnosis. *W. pallescens* is similar to *W. brunnescens* and *W. brendelli* but differs in shape of male genitalia (Figs 22, 23). It also differs from *W. brunnescens* in being light yellow in colour and from *W. brendelli* in having quadrate elytral reticulate cells.

Measurements. Male. Length of body 5.1 mm, width at humeri 1.05 mm, length of pronotum 0.77 mm, width of pronotum 0.96 mm, interocular distance 0.31 mm, maximum diameter of eyes 0.44 mm.

Type material. Holotype, ♂, "Indonesia, Sulawesi Utara, Dumonga-Bone N. P., February 1985, Fog 1, 230 m, 5. ii. 1985, BMNH Plot A, tray 44" (BMNH); paratypes, all collected in Dumonga-Bone N. P.: ♀, "2.–9. Oct. 1985, Malaise trap 3, Plot B, ca 300 m, Lowland forest"; ♂, "17.–24. Apr 1985, Malaise trap 1"; ♂, "March 1985, Fog 11, 230 m, 10. iii. 85, BMNH Plot A, Tray 63"; ♂, "February 1985, Plot C, ca 400 m, Lowland forest, Flight interception trap"; ♂, "March 1985, Fog 11, 280 m, 10. iii. 85, BMNH Plot A, Tray 81" (BMNH, LMBC).

Etymology. The specific name refers to the pale yellow colouration.

Distribution. Lowland forests of Northern Sulawesi.

Wakarumbia similis sp. n.

Description

Male. Body small, parallel-sided to slightly widened posteriorly. Whole body dark brown to black except trochanters and mouth parts. Both longitudinal and transverse elytral costae slightly lighter than bottom of elytral cells. Head small, shining, with small antennal tubercles, eyes small, but hemispherically prominent, interocular distance 1.21–1.25 times maximum eye diameter. Antennae slender, longer than three quarters length of elytra, antennal segments nearly parallel-sided. Pronotum trapezoidal, 1.21 times wider than long, with acutely prominent hind angles. Scutellum flat, deeply bilobed. Elytra with primary costae 2 and 4 strong and reaching apex of elytra, costae 1 and 3 very weak, slightly shortened. Legs strongly compressed, slender. Male genitalia with slender base of phallus (Figs. 17).

Female. Interocular distance 1.52 times maximum eye diameter. Female genitalia with long, slender vagina, enlarged basal part of spermaduct and slim spermatheca (Fig. 28).

Differential diagnosis. *W. similis* differs from the very similar *W. nigra* in having a much slenderer basal part of phallus (compare Figs 15, 16 and 17).

Measurements. Male. Length of body 5.0 mm, width at humeri 1.0 mm, length of pronotum 0.74 mm, width of pronotum 0.89 mm; interocular distance 0.37 mm, maximum diameter of eyes 0.31 mm.

Type material. Holotype, ♂, "Indonesia, Sulawesi Utara, Gng. Ambang F. R., nr. Kotamobagu, 17. Feb 1985, Lower montane forest 1200–1300 m" (BMNH); paratype: ♀, "Indonesia, Sulawesi Utara, Gng. Ambang F. R., nr. Kotamobagu, 18.–24. May 1985, Gunung Muajat summit 1760 m, Malaise trap" (BMNH).

Other material examined: ♂, same locality data as holotype, 19.–25.iii.1985 (BMNH).

Etymology. *W. similis* is very similar to *W. nigra* sp. n. and the specific name refers to this fact.

Distribution. Northern Sulawesi.

Remark. The second male differs slightly from the other specimens as it lacks the lighter elytral costae and has more dense transverse costae. The male genitalia are almost identical with those of the holotype and therefore it is provisionally identified as *W. similis* but it is not included in the type series.

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