

## **New *Grouvellina* species from Eastern Madagascar (Coleoptera: Carabidae: Rhysodini) - III.**

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**Taxonomy, description, new species, Coleoptera, Carabidae, Rhysodini, *Grouvellina*, Ethiopian Region, Madagascar**

**Abstract.** Three new species *Grouvellina kmecoi* sp. nov., *G. ranomafana* sp. nov. and *G. minor* sp. nov., all from Eastern Madagascar, are described, illustrated and compared with the nearest congeners.

### INTRODUCTION

The genus *Grouvellina* R. T. Bell et J. R. Bell, 1978 is the only genus of Rhysodini known from Madagascar and comprises nineteen described species (Bell & Bell 1979, 1985 and 2011; Hovorka 2007, 2009). They are known exclusively from Madagascar and the nearby Comoro Islands. The purpose of recent paper is to describe three new species belonging to this genus, two of them from Fianarantsoa Province and one from Toamasina Province, Madagascar.

### MATERIAL AND METHODS

The present paper is based on the study of type material of the new species described below and additional material of related species from the collection of the author. The specimens included in this study are deposited in the following private collection: RKPC Rudolf Kmeco, private collection, Olomouc, Czech Republic.

Measurements were made with a MBS-10 stereoscopic microscope, at magnifications of 8x, 16x and 32x. Measurements of body parts and corresponding abbreviations used in the text are as follows:

EL = elytral length - length of left elytron measured along suture from basal border to apex;  
EW = elytral width – maximum width of both elytra combined;  
HL = length of head - measured from apex of clypeus to posterior margin of temporal lobe;  
HW = width of head - maximum width of head (including eyes);  
PL = pronotal length - length of pronotum measured along mid-line;  
PW = pronotal width - maximum width of pronotum;  
TL = total length - length measured from the apex of left mandible (mandibles closed) to the apex of left elytron.

The morphological terms used in this study are adopted from Bell & Bell (1978, 1979). All type specimens of the newly described species are provided with locality label and

one red printed label: “*Grouvellina kmecoi* (or *ranomafana* or *minor*) sp. nov., HOLOTYPE, det. O. Hovorka, 2016”.

## DESCRIPTIONS

### *Grouvellina kmecoi* sp. nov.

(Figs. 1-3)

**Type material.** Holotype (♀) labelled: “Madagascar, Fianarantsoa prov., 34 km S of Ambositra, 1720 m, 4.-5.i.2013, Rudolf Kmeco leg.” (RKPC).

**Description.** Habitus - the new species is relatively large, habitually very similar to its congeners. Body colour (including appendices) dark brown to black, only tarsomeres lighter brown and palpomeres red-brown to yellow-brown. Body narrow, elongate. TL 6.7 mm. Head slightly longer than wide, HL/HW 1.07. Pronotum markedly longer than wide, PL:PW 1.32 and distinctly wider than head, PW/HW 1.29. Elytra elongate, EL/EW 2.38, widest near the midlength.

Head (Fig. 1) with large eyes. Antennae with tufts of minor setae on antennomeres V-X.

Antennomere XI longer than wide, apical stilet prominent, 0.25 as long as antennomere. Antennomere I dorsally extensively pollinose, antennomere II with two transverse pollinose bands, antennomeres III-X with incomplete apical and basal bands of pollinosity. Frontal, antennal and postclypeal grooves deep. Orbital groove complete. Median lobe long, wide, gradually widened posteriad, its tip almost transversely cut, truncate. Parafrontal bosses small, but distinct. Temporal lobe 1.44 times longer than wide, distinctly sinuate anteriorly to obtuse median angles, latter narrowly separated. Only one temporal seta present, inserted in isolated patch of pilosity near the hind margin of temporal lobe. Pollinosity of mentum and postmentum as on Fig. 2; six pairs of prelabial setae and three pairs of postlabial setae present. Labrum with two pairs of setae.

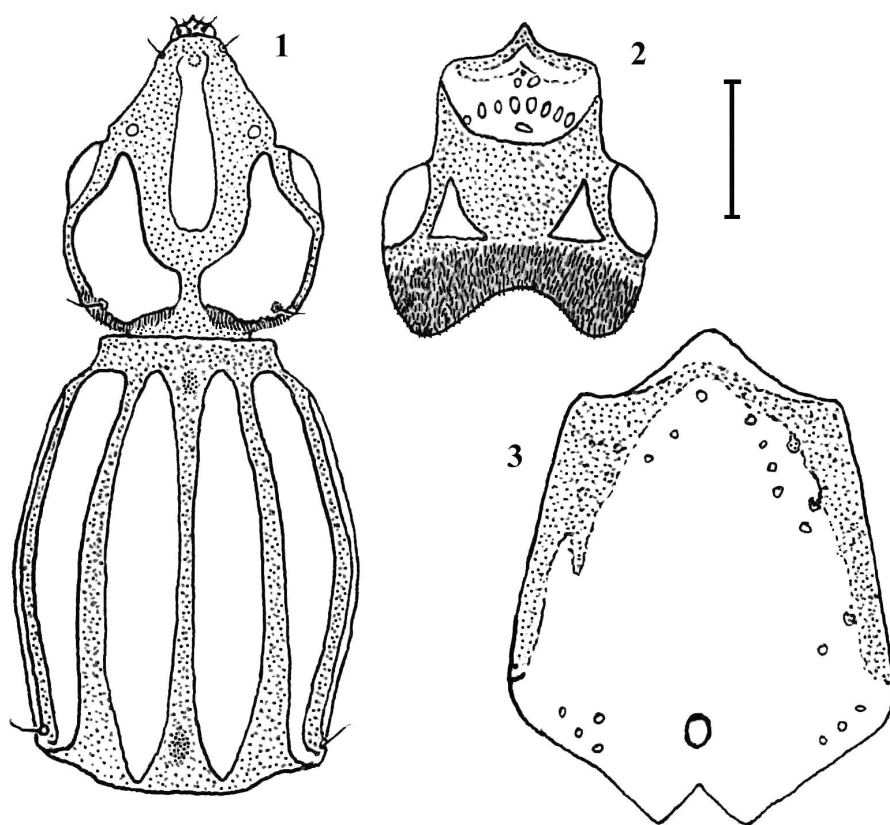
Pronotum (Fig. 1) elongate, convex, its widest point approximately at the middle, distinctly narrowed at the base, more strongly at apex. Lateral pronotal margin not sinuate anteriorly to hind angle, with 3 lateral setae and angular seta. Pronotal carinae wide, much wider than the grooves, subconvex; inner pair straight and rounded on both sides, outer carinae obtuse or transversely cut at apex, narrowed towards base, extreme tips divergent. Basal impression narrow. Precoxal carina short, inconspicuous due to pollinosity. Prosternal process with deep pit between anterior coxae, followed by elongate groove, which is connected with deep, transverse, semicircular apical cavity. All this grooves and cavity pollinose.

Elytral striae I-IV narrow, narrower than interstriae, coarsely punctured, pollinose; elytral stria V widened posteriad, very conspicuously pollinose; stria VI formed in anterior half by row of punctures only. Elytral intervals relatively wide, flat to slightly convex. Humeral tubercle moderately prominent, elytral base concave with slightly projected second elytral intervals. Elytral stria I without setae, elytral stria II with 2 setae in apical third, elytral stria III with one seta near apex, elytral stria IV with 5-6 setae, elytral stria VII with 5/7 setae

in apical quarter, apical tubercle without setae. Metasternum (Fig. 3) with lateral pollinose strips and large punctures along them and anteriorly at the middle, otherwise unpunctured; posteriorly with deep medial pit. Anterior femur with ventral tooth. Femora of all pairs in female sinuate ventrally.

Abdominal sterna III-V without visible punctures, laterally with pit (deepest pit on sternum IV in female), pits connected along anterior margin of sternites by transverse, uninterrupted stripe of pollinosity. Last visible sternite wholly punctured, anterior transverse strip of pollinosity incomplete, present only laterally, in the middle formed by transverse row of pollinose punctures, posteriorly is last sternite margined by complete, narrow stripe of pollinosity.

**Differential diagnosis.** The newly described species is characterized by unique set of characters and differs from all its congeners. Combination of several important characters (complete outer pronotal carina, presence of ventral femoral tooth, presence of complete



Figs. 1-3: *Grouvellina kmecoi* sp. nov.: 1- head and pronotum, dorsal view; 2- head, ventral view, setae omitted; 3- metasternum. Scale bar 0.5 mm.

and pollinose orbital groove, presence of parafrontal boss, shape of pronotum, pollinosity of postmentum) is shared with other Malagasy species - *G. gigas* R.T. et J.R. Bell, which is probably its nearest relative. *G. kmecoi* sp. nov. differs from this species by the presence of pollinose bands on antennomeres III-X, by the presence of only one temporal seta, by the truncate median lobe on head, by smaller body size etc.

**Name derivation.** The species is named in honour of Rudolf Kmeco, Czech entomologist, specialist in Carabidae, who collected the type specimen of the new species.

***Grouvellina ranomafana* sp. nov.**

(Figs. 4-7)

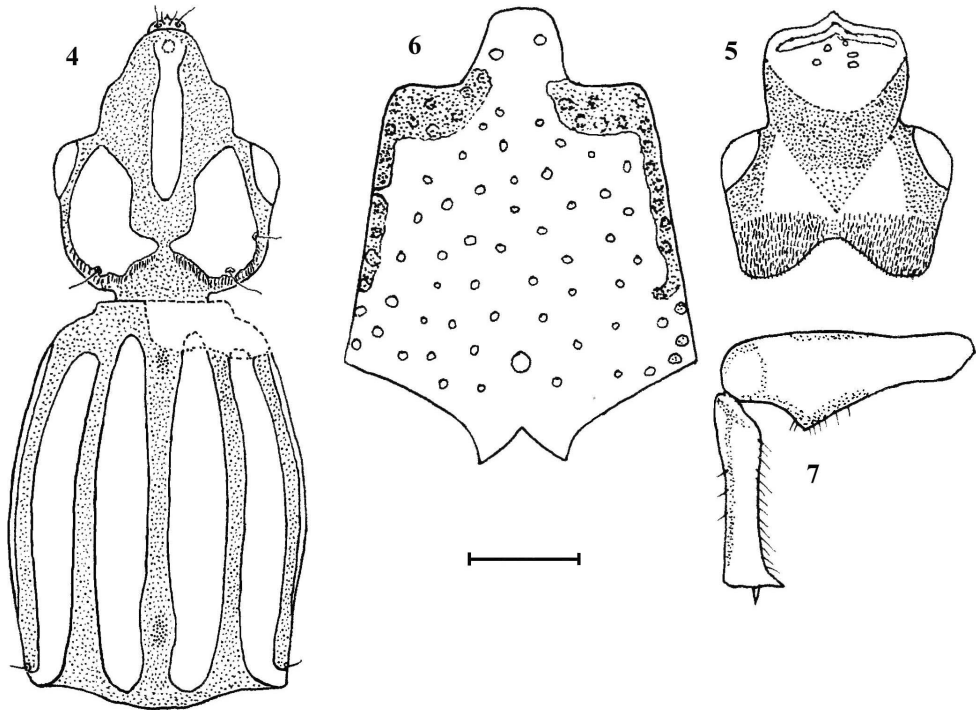
**Type material.** Holotype (♂) labelled: "Madagascar, Fianarantsoa prov., Ranomafana NP, 850-1150 m., 6.-10. i.2013, Rudolf Kmeco leg." (RKPC). Type specimen is partially damaged by some pest (probably *Anthrenus* larva), there are two round holes, one on right anterior pronotal angle and second laterally before apex of left elytron and on lateral parts of abdominal sternites V and VI. Inner organs including genitalia are missing.

**Description.** Habitus - the new species is medium-sized, habitually very similar to its congeners. Body colour (including antennae) is brown-black including legs and antennae, only tarsomeres lighter. Palpomeres yellow-brown. Body elongate, narrow. TL 7.6 mm. Head slightly longer than wide, HL:HW 1.16. Pronotum 1.30 times wider than head, distinctly longer than wide (PL:PW 1.44). Elytra elongate, EL:EW 2.35, widest near the midlength.

Head (Fig. 4) relatively short and broad, with large eyes. Antennae with tufts of minor setae on antennomeres V-X. Antennomere XI longer than wide, apical stilet prominent, 0.18 as long as antennomere. Antennomeres I and II dorsally extensively pollinose, antennomeres III-X with complete apical band of pollinosity. Frontal, postclypeal and antennal grooves deep. Orbital groove shallow, narrow but distinct and complete. Median lobe elongate, nearly parallel-sided, with basal constriction and rounded tip. Parafrontal boss indistinct. Frontal space U-shaped, transverse, deep. Temporal lobe with median margin strongly emarginate, medial angles rounded, narrowly separated. Posterior medial margin of temporal lobe concave, forming distinct occipital angle; surface impunctate; two to three temporal setae present. Posterior margin of temporal lobe bordered by pollinosity. Postorbital and suborbital tubercles absent. Mentum and submentum as in Fig. 5; six to seven pairs of prelabial setae and four pairs of postlabial setae present. Labrum with two pairs of setae.

Pronotum (Fig. 4) moderately long, widest near middle; base and apex narrowed. Lateral pronotal margins curved, scarcely sinuate anteriorly to hind angles. Pronotal carinae wide, much wider than the grooves. Inner carina nearly 1.5 times wider than outer carina at middle. Inner margin of outer carina slightly but distinctly curved near base. Inner carina tapered to apex, less distinctly to base. Both carinae impunctate. Prosternum with short precoxal carina, together with propleuron minutely pollinose, so that surface is matt. Prosternal process similar to following species.

Elytral striae impressed, punctate, pollinose, interstriae slightly convex. Elytral stria V widened posttriad, conspicuously pollinose; stria VI formed in anterior half by row of punctures only. Humeral tubercle prominent, elytral base concave with distinctly projected



Figs. 4-7: *Grouvellina ranomafana* sp. nov.: 4- head and pronotum, dorsal view; 5- head, ventral view, setae omitted; 6- metasternum; 7- metafemur and metatibia of male. Scale bar 0.5 mm.

second elytral intervals. Elytral striae I and III without setae, elytral stria II with 6-7 setae along whole length, elytral stria IV with 5-6 setae, elytral stria VII with 5/6 setae near apex, apical tubercle without setae. Metasternum (Fig. 6) punctured, laterally with more dense, larger, pollinose punctures, towards middle punctures are smaller and not pollinose; anterior margin on each side with transverse, slightly curved, wide pollinose furrow just behind middle coxa; posteriorly with deep, sharply delimited medial pit. Abdominal sterna punctured; punctures large, but not visible due to strong pollinosity, which is forming continuous transverse stripe on sternites III-V. Last visible sternite laterally and posteriorly with large, pollinose punctures, anterior half in middle part with normal punctures, forming very irregular transverse rows.

Anterior femur with strong ventral tooth in male, and anterior tibia with distinct proximal tooth. Male middle tibia widened at apex, forming long and sharp calcar. Hind tibia of male with large, subacute calcar (Fig. 7), which is shorter than those on mesotibia. Meso- and metafemur with strong tubercle slightly posteriad the midlength, strongly incised before apex.

Aedeagus not known (see above).

**Differential diagnosis.** *Grouvellina ranomafana* sp. nov. is characterized by unique set of characters and differs from all its congeners. Combination of several important characters (complete outer pronotal carina, presence of ventral femoral tooth and of proximal tibial tooth in male, presence of complete and pollinose orbital groove, absence of parafrontal boss) is shared with two other Malagasy species - *G. hova* R.T. et J.R. Bell, 1979 from Toamasina Province and *G. janaki* Hovorka, 2007 from Anosy Region. *G. hova* is very large species (8.7-9.0 mm) with much more pollinosity on temporal lobe, different chaetotaxy etc. *G. janaki* differs by smaller size, shape of median lobe, not so elongate last antennomere etc. Moreover both mentioned species differ from *G. ranomafana* sp. nov. by the absence of precoxal carina.

**Name derivation.** The species name is toponymic, the *G. ranomafana* sp. nov. is named according to its locality - Ranomafana National Park in southeastern part of Madagascar.

***Grouvellina minor* sp. nov.**

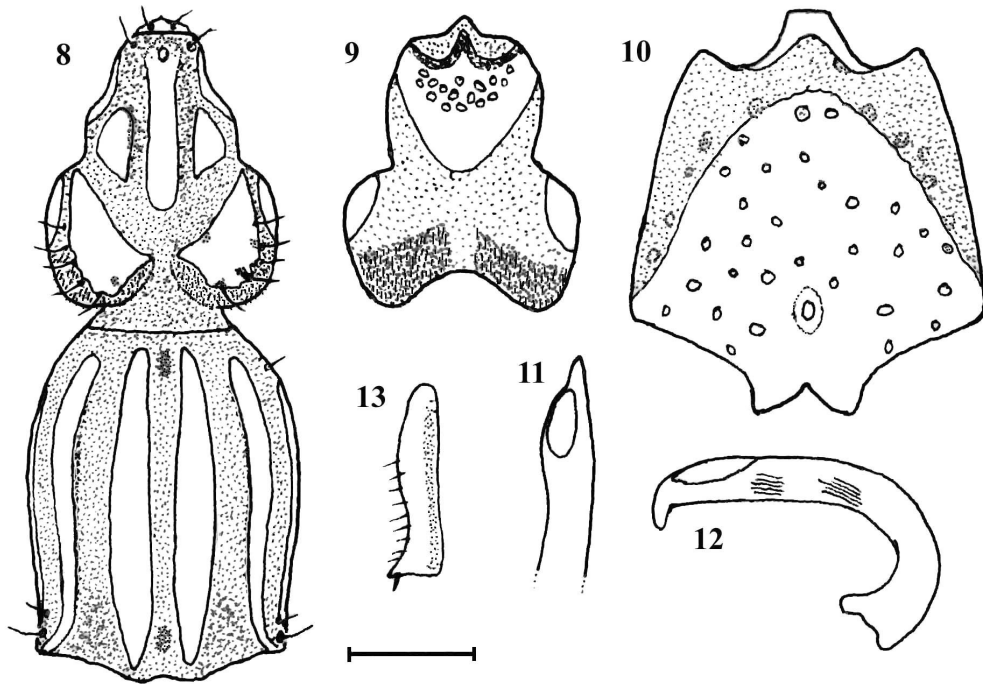
(Figs. 8-13)

**Type material.** Holotype (♂) labelled: "Madagascar, Toamasina prov., Andasibe, 930-1050 m, Analamazaotra Reserve, 14.-20.i.2013, Rudolf Kmeco leg." (RKPC).

**Description.** Habitus - the new species is small, habitually very similar to its congeners. Body colour (including legs and antennae) is dark brown to brown-black, legs with femora darker than tibiae and tarsi. Palpomeres yellow-brown. Body elongate, narrow. TL 5.9 mm. Head slightly longer than wide, HL:HW 1.15. Pronotum 1.20 times wider than head, distinctly longer than wide (PL:PW 1.18). Elytra elongate, EL:EW 2.26, widest near the midlength.

Head (Fig. 8) relatively short, broad, with large eyes. Antennae with tufts of minor setae on antennomeres V-X. Antennomere XI longer than wide, apical stilet distinct, 0.20 as long as antennomere. Antennomeres I-X punctate. Scapus and pedicellus dorsally with wide pollinose band, first and second flagellomere with apical narrow continuous pollinose band, third flagellomere with discontinuous apical pollinose band, flagellomeres IV-IX pollinose only on bottom of large punctures, from which arises large apical or basal (in case of flagellomeres VI-IX) setae. Frontal, postclypeal and antennal grooves deep. Orbital groove shallow, narrow but distinct and complete. Median lobe long, almost parallel-sided with basal constriction and rounded tip. Parafrontal boss present, relatively large,  $\pm$  triangular. Frontal space broad, transverse, deep. Temporal lobe with median margin slightly emarginate, medial angles obtuse, widely separated; posterior medial margin concave; surface without punctures; five temporal setae present. Postorbital and suborbital tubercles absent. Mentum and submentum widely covered by pollinosity (Fig. 9), relatively small part of their surface glabrous. Mentum punctured, punctures arranged in two to three irregular transverse rows. Four to five pairs of prelabial setae and three pairs of postlabial setae present.

Pronotum (Fig. 8) elongate, its sides slightly convex, widest point in the middle, slightly narrowed at the base, more strongly at apex. Lateral pronotal margin slightly, but distinctly sinuate anterior to hind angle, two lateral setae and angular seta present. Pronotal carinae



Figs. 8-13: *Grouvellina minor* sp. nov.: 8- head and pronotum, dorsal view; 9- head, ventral view, setae omitted; 10- metasternum; 11- median lobe of aedeagus, lateral view; 12- median lobe of aedeagus, dorsal view; 13- posterior tibia of male. Scale bar 0.5 mm.

narrow, outer carina about as wide as the grooves, slightly curved; inner carina straight, strongly narrowed on both sides, outer carinae less narrowed, more strongly towards base, less narrowed and transversely cut towards apex. Both carinae impunctate. Inner carina 1.55 times wider than outer carina at middle. Median groove with both anterior and posterior median pit developed, similarly large and deep. Basal impression wide, fully pollinose. Epipleuron of pronotum covered with fine pollinosity. Precoxal carina absent. Prosternite glabrous, prosternal process with deep pit between anterior coxae, lying in elongate groove, which is connected with deep, transverse pollinose apical cavity. Precoxal carinae distinct, nearly 0.5 as long as distance to anterior margin of prosternum.

Elytral striae narrow, with coarse and deep punctures, pollinose. Inner elytral intervals relatively wide, outer ones narrow, all intervals convex. Humeral tubercle moderately prominent, elytral base concave with projected second elytral intervals. Elytral stria I with one seta near apex, elytral stria II with seven setae along whole length, elytral stria IV with 6 setae, elytral striae V and VI each with one seta near apex, elytral stria VII with 4-5 setae in apical third, apical tubercle with 2 setae. Metasternum (Fig. 10) with lateral pollinose strips, which are widened anteriorly and anteriorly connected; whole surface with large, sparse punctures; posteriorly with deep medial pit.

Anterior femur without ventral tooth, male without proximal tooth on anterior tibia. Middle and hind femora ventrally only slightly sinuate. Hind calcar of male (Fig. 13) not large, its tip blunt.

Abdominal sterna III-V laterally with pit (deepest pit on sternum IV in male), pits punctate, connected by transverse, uninterrupted, punctate and pollinose groove. Last visible sternite wholly punctured, anterior transverse strip of pollinosity incomplete, present only laterally, in the middle formed by transverse row of pollinose punctures. Aedeagus as on Figs 11-12. The aedeagal tip is strongly bent down in lateral view, and on the right side of median lobus are two fields of elongated to slightly oblique fine grooves.

**Differential diagnosis.** The new species share several important characters (complete outer pronotal carina, absence of ventral femoral tooth, absence of proximal protibial tooth in male, bisetose labrum, and long, narrow and parallel-sided median lobe of head) with two other Malagasy species - *G. radama* R.T. et J.R. Bell, 1979 and *G. bulirschi* Hovorka, 2007, which are probably its nearest relatives. Both mentioned species have pronotal carinae of more or less equal width (*G. radama* narrow, as wide as grooves, *G. bulirschi* wide, much wider than grooves), whilst *G. minor* sp. nov. has strongly uneven pronotal carinae, inner carina being markedly wider than outer carina. Moreover, there are many other different character states distinguishing *G. minor* sp. nov. from mentioned species - large parafrontal boss, the elytral chaetotaxy, pollinosity and punctures of metasternum, body size etc.

**Name derivation.** The name reflects small size of the described species (Latin word “minor” means “rather small”). The *G. minor* sp. nov. belongs together with *G. edentata* R.T. et J.R. Bell, 1979 and *G. janaki* Hovorka, 2007 to the smallest species in the genus with body length (as far as known) less than 6 mm.

**CORRECTION.** It was stated in the description of *Yamatosa haucki* (Hovorka, 2015: 25) that the only sexual dimorphic difference is absence of metatibial spur in female. The truth is, of course, that the only difference between male and female of *Y. haucki* Hovorka, 2015 is absence of metatibial **calcar** in female. I am very sorry for this fault.

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