

A peculiar new species of the genus *Sphallomorpha* WESTWOOD from New Guinea (Coleoptera: Carabidae)

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Abstract

As a further supplement to the general revision of the Australian-New Guinean carabid subfamily Pseudomorphae (Coleoptera: Carabidae) the new species *Sphallomorpha oculata* is described from western New Guinea. The new species belongs to a separate, new species-group (in the sense of the revision) of uncertain relationships and is distinguished at once by the striking pattern of two conspicuous circular reddish elytral spots.

Key words: Coleoptera, Carabidae, Pseudomorphae, *Sphallomorpha*, New Guinea, taxonomy, new species.

Introduction

Within a sample of Carabidae from the Naturhistorisches Museum Wien sent for identification, I discovered a single specimen of a striking new species of the pseudomorphine genus *Sphallomorpha* WESTWOOD that is described herein. This description is regarded a further supplement to the general revision of the Australian-Oriental species of the carabid subfamily Pseudomorphae (BAEHR 1992, 1993a, b, 1994b, 1997, 2002).

Pseudomorphae is a subfamily containing strange looking dytisciform or scolytiform carabid beetles of still doubtful relationships which are mainly distributed throughout Australia, but also occur in New Guinea, the southern part of the Oriental region, South Africa, and South and Central America including the southern margin of North America. At the present state of knowledge, the subfamily includes six genera of which *Sphallomorpha* WESTWOOD is the largest. Certainly Australia at present is the centre of diversity of the subfamily, because all six genera occur there and about 90 percent of the recorded species are Australian. Even if the place of origin of Pseudomorphae is not finally settled, the main taxonomic radiation and further evolution of the subfamily certainly occurred in Australia, where the most plesiotypic genus *Pseudomorpha* KIRBY occurs as well as highly evolved genera like *Adelotopus* HOPE, *Cainogenion* NOTMAN, and *Pausotropus* WATERHOUSE. Only the quite aberrant genus *Cryptocephalomorpha* RITSEMA seems to have first evolved in South Africa or that part of the former supercontinent Gondwana from which southern Africa originated. So, in general, Pseudomorphae is a striking example for a group of southern, Gondwana origin.

From New Guinea only few species of the genera *Sphallomorpha*, *Adelotopus*, and *Cryptocephalomorpha* have been recorded and apparently pseudomorphine beetles are rare in New Guinea and mainly occur there in habitats of decidedly "Australian" type, namely open savannahs in the south-eastern part of this island where the adults live under the bark of regularly bark-shedding eucalypts. Nevertheless, a few species apparently live in rain forest (BAEHR 2002), and these species seem to have colonized other parts of New Guinea, but are very rarely

sampled. Almost all species of the genus *Sphallomorpha* recorded from New Guinea, therefore, are yet known from single specimens. Unfortunately, almost nothing is known about life histories, nutrition, and reproduction of Pseudomorphinae in general and in particular of those living in New Guinea. Larvae have been described from very few species of *Sphallomorpha* and several species of the genera *Adelotopus* and *Cainogenion*, though from the latter two genera we only know 1st instar larvae from the oviducts of these larviparous beetles.

Additional information about relationships of the whole group and of the genera, as well as about distribution, biogeography, and habits can be obtained from BAEHR (1992, 1994a, 1997, 2002).

In the revision of the genus *Sphallomorpha*, BAEHR (1992, 1993a, 1993b, 1994b) erected a number of species-groups that confidently represent monophyletic units. Due to certain special characters that do not occur together in any other species of *Sphallomorpha*, a new, separate species-group is erected for the new species described in the present paper, which is characterized below. Although male genitalia of the new species are not yet recorded, the character states mentioned in the diagnosis below sufficiently characterize the species and species-group to be described.

Methods and abbreviations

Measurements were taken using a stereo microscope with an ocular micrometer and in the same manner as specified in the revision by BAEHR (1992). It should be noted again, however, that the length has been measured from the apex of the labrum to the elytral apex, and the length of the pronotum was taken along midline.

The habitus photograph was obtained by a digital camera using SPOT Advanced for Windows 3.5 and subsequently was worked with Corel Photo Paint 10.

As stated in the revision, in the genus *Sphallomorpha* chaetotaxy offers very important characters not only distinctive for species but also for the species-groups which have been erected in the revision for postulated monophyletic units. Therefore the important fixed setae are enumerated in the description, and to maintain a comparable style of description, these are abbreviated.

clyp	clypeal seta (either side)
des	dorso-median ensiform seta
gloss	glossal setae, on ventral rim of apex of glossa (either side)
gul	gular setae, inside of gular suture (either side)
labr	labral setae (common)
marg	marginal setae, along margin of elytra (either side)
ment.lat	lateral mental setae, on wings of mentum (either side)
ment.med	medial mental setae, at base of mental excision or tooth (common)
ns	(dorsal) nematiform setae
postorb	postorbital setae, posteriorly of eye on a conspicuous rim (either side)
preorb	preorbital seta (either side)
proeps	proepisternal setae, longitudinally and transversally on proepisternum (either side)
pron.ant	anterior pronotal setae, near anterior angle of pronotum (either side)
pron.post	posterior pronotal setae, near posterior angle of pronotum (either side)
suborb	suborbital setae, below eye, laterally of gular suture (either side)
supraorb	supraorbital seta (either side)
st VI	setae on posterior border of sternum VI, the penultimate visible sternite (either side)
♂ st VII	setae of male sternum VII, the terminal visible sternite (either side)
♀ st VII	setae of female sternum VII, the terminal visible sternite (either side)
ves	ventro-lateral ensiform setae

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Sphallomorpha oculata-group

Diagnosis: Small, wide, moderately convex species with a circular, reddish discal spot on either elytron; elytral striae absent; supraorbital seta absent; labrum wide, anteriorly straight, symmetric, 4-setose; mental tooth absent, though with rather convex prominence; mental setae absent; gular sutures obtusely angulate; two gular setae present; glossa deeply excavate, 7-setose; galea narrow, attenuate; palpi and antenna short; eyes depressed; basal angles of pronotum obtusely rounded; elytra with 13 marginal setae; ♀ sternum VII wide, 4-5-setose; stylomere 2 very short with extremely short apex, with two dorsal nematiform setae (**ns**), one stout dorso-median ensiform seta (**des**), and three very stout latero-ventral ensiform setae (**ves**), that are all situated very close to apex of stylomere; base of stylomere 2 not concealed. Male genitalia so far unknown.

Occurrence: So far a single species known from western New Guinea.

Systematic position: Although the systematic position of this species-group apparently is rather isolated, it shares several technical characters with the *tamborinae*-group (BAEHR 1992): in particular the rather convex mentum, absence of postorbital and mental setae, and symmetric, apically not incised labrum. In body shape and elytral pattern, however, the *tamborinae*-group (with the single species *S. tamborinae* BAEHR) is quite different and relationships between both species seem to be rather remote. Moreover, *S. tamborinae* so far is known only from Mt. Tamborine south of Brisbane, south-eastern Queensland, and because most species-groups seem to inhabit more or less well circumscribed areas, it is rather doubtful that close relationships should exist between a southern Queensland species that apparently is restricted to a very small patch of forest, and a western New Guinean species. Nevertheless, when using the key to the species-groups (see BAEHR 1992) one will come closest to the *tamborinae*-group, provided that the different elytral patterns are neglected.

Sphallomorpha oculata sp.n.

TYPE MATERIAL: **Holotype**: ♂, "IRIAN JAYA, Paniai Prov., road Nabire-Iraga, km 160, 4.9.1996, 600m, leg. M. BALKE (96 # 14)" (Naturhistorisches Museum Wien).

DIAGNOSIS: Immediately recognized by the striking pattern which is unknown not only in species from New Guinea though even within the whole genus, except for species of the *albopicta*-group of the revision which, however, are much larger, never possess a circular discal spot, and are quite different also in a variety of other characters.

DESCRIPTION: Measurements: Length: 5.1 mm; width: 3.0 mm. Ratios: Width pronotum/head: 1.76; width elytra/pronotum: 1.16; width/length of pronotum: 2.35; length/width of elytra: 1.18; length elytra/pronotum: 3.23.

Color (Fig. 1): Upper surface black, lower surface of thorax black to dark piceous, of abdomen light reddish. Lateral borders of pronotum and elytra with narrow, ill delimited reddish margin. Labrum, palpi, lower mouth parts, and antennae light reddish. Femora light reddish, tibiae and tarsi slightly darker.

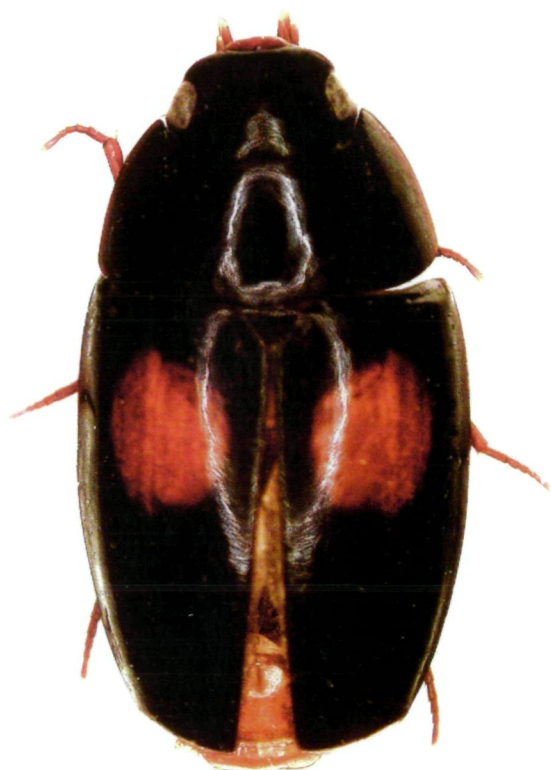


Fig. 1: *Sphallomorpha oculata* sp.n. Holotype. Length: 5.1 mm.

Chaetotaxy (Figs. 2, 3): Supraorb: -; preorb: 1; clyp: 1; labr: 4; ment.med: -; ment.lat: 1-2 short; gloss: 1 long + 6 short; gul: 2; postorb: 2; suborb: 4-5; pron.ant: -; pron.post: -; proeps: -; marg: 13; st VI: 2; ♀ st VII: 4-5.

Head (Figs. 2-4): Moderately wide, rather short, convex, frontal impressions absent. Clypeus feebly concave, clypeal sutures feebly impressed, very indistinct, incomplete. Lateral border of head convex, not incurved in front of eyes, eyes not produced over outline of head. Labrum moderately transverse, barely excised in middle, symmetric, laterally very oblique. Mentum with remarkably convex prominence. Wings of mentum short, wide, apex evenly rounded, subapically slightly convex, medially almost straight. Apex of glossa feebly excised, border moderately sharp. Dorsal part much surpassing ventral part, deeply sinuate in middle, laterally convex, with some minute hairs. Terminal labial palpomere moderately wide, not securiform, terminal maxillary palpomere fairly small, short, attenuate. Galea attenuate. Median antennomeres ca. 1.6 x as long as wide. Microreticulation very fine, distinct though superficial, isodiametric, surface with sparse, minute punctures, impilose, rather glossy. Palpi sparsely pilose. Galea with few short hairs on anterior border. Lower surface with scattered short hairs.

Pronotum: Rather wide, dorsally fairly convex. Apex deeply excised, excision straight. Anterior angles prominent, acute. Sides evenly, though moderately convex, widest immediately at posterior angles. Base gently bisinuate, rather incurved to the obtuse though quite marked basal

angles. Lateral margins with very fine border line. Discal impressions extremely shallow, circular, difficult to detect. Microreticulation fine, superficial, barely recognizable, consisting of isodiametric meshes. Punctuation sparse, minute, very difficult to detect, surface without pilosity, glossy.

Elytra: Fairly wide, moderately elongate, convex, laterally gently rounded, widest slightly behind basal third. Apex wide, gently oblique. Only inner three striae extremely vaguely indicated, very difficult to recognize, outer striae invisible. Intervals absolutely depressed. Series of marginal pores slightly spaced in middle. Microreticulation superficial, difficult to detect. Surface with scattered, minute punctures, highly glossy. Posterior wings present.

Lower surface: Prosternal process moderately elongate, wide, apex convex, rounded to ventral surface, without any setae or hairs. Metepisternum ca. 1.5 x as long as wide.

Legs: Moderately elongate. Metatarsus slightly shorter than metatibia. Tarsi sparsely pilose. Basal tarsomere of metatarsus as long as 2nd and 3rd tarsomeres together.

Male genitalia: Unknown.

Female genitalia (Figs. 5, 6): Sternum VII wide, rather short, border gently convex, with a fringe of short hairs along and near border. Stylocere 2 very short and compact, with unusually short, obtuse apex. Two short **ns** present. A short and stout **des** situated very close to apex, with three large, very stout, tightly packed **ves** also located close to apex.

Variation: Unknown.

DISTRIBUTION: Central Irian Jaya, western New Guinea. Known only from type locality.

HABITS: Unrecorded. Certainly this is a corticolous species, though it is unknown, in which sort of habitat it occurs, either rain forest or open sclerophyll forest.

RELATIONSHIPS: Uncertain, although in certain character states the new species is similar to *S. tamborinae* of southern Queensland. These similarities, however, do not implicitly demonstrate close relationship of both species, because they are either plesiomorphic character states, or may be rather homoplasious than synapomorphic, in particular when certain reductions of chaetotaxy are concerned.

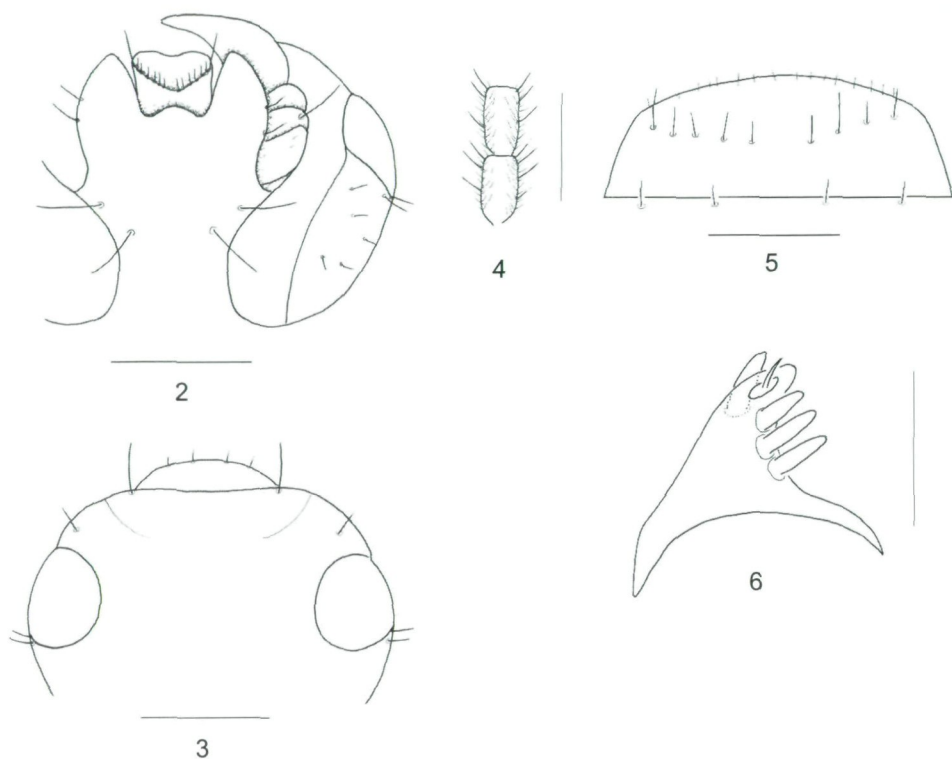
ETYMOLOGY: The name refers to the conspicuous bioculate colour pattern of the elytra.

RECOGNITION: The key to the species-groups in BAEHR (1992: pp. 25-29) easily leads to caption **39** - which has to be completed by a note about the bimaculate elytral pattern, then to caption **42**, where the new *oculata*-group must be inserted.

When using the key to the species (BAEHR 1992: pp. 30-51), caption **131** - is easily reached but has to be completed by a note about the bimaculate elytral pattern. When further proceeding, caption **138** is reached, but from here the key does not longer work properly, because *S. oculata* combines character states that do not occur together in any described species and thus, are divided in the following parts of the key.

Zusammenfassung

Als ein weiterer Nachtrag zu der Revision der Laufkäfer-Unterfamilie Pseudomorphae Australiens und Neuguineas wird die neue Art *Sphallomorpha oculata* aus dem Westteil Neuguineas beschrieben. Die neue Art gehört zu einer eigenen, neuen Artengruppe ungeklärter Verwandtschaft und ist auf den ersten Blick durch ihre auffällige, aus zwei runden, rötlichen Flecken bestehende Elytrenzeichnung gekennzeichnet.



Figs. 2 - 6: *Sphallomorpha oculata* sp.n., details of head and female genitalia; 2) lower surface of head, 3) upper surface of head, 4) 5th and 6th antennomeres, 5) female sternum VII, 6) female stylomere 2. Scales: Figs. 2, 3, 5: 0.5 mm; Figs. 4, 6: 0.1 mm.

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