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## A new species of the genus *Sphallomorpha* Westwood from inland New South Wales, Australia

(Coleoptera, Carabidae, Pseudomorphini)

17<sup>th</sup> supplement to the “Revision of the Pseudomorphinae of the Australian Region”

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A new pseudomorphine carabid species is described from inland New South Wales, Australia: *Sphallomorpha vratislavi*, sp. nov. According to the combination of certain character states of chetotaxy and of structure of the female gonocoxites, the new species does not fit into any of the species groups as established in the revision of the genus (Baehr 1992). Therefore, a new species-group is erected for the new species.

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### Introduction

Through courtesy of Vratislav Bejsák (Sydney) I received a number of Australian carabid specimens for identification which, “inter alia”, included a single female of the pseudomorphine genus *Sphallomorpha* Westwood, 1837. It does not fit into any of the species groups as enumerated in the revision of this genus (Baehr 1992). In spite of the presence of a single specimen which, moreover, is a female, this species is described, because it combines in a unique way character states of different species groups, and because it is from an inland area, from where only very few records of pseudomorphine beetles are available.

Pseudomorphini (or -inae, according to the opinion of the respective workers) is a moderately large tribe (or subfamily) of Carabidae of outstanding shape and structure and with a very specialized biology, that mainly occurs in Australia and America. Most species are more or less depressed and possess

depressed legs and a reduced chetotaxy. According to the genera to which they belong, their habitus either is very similar to that of water beetles of the families Dytiscidae or Hydrophilidae, or to that of wood inhabiting scolytids or even colydiids. The species of most genera are larviparous, which mode of reproduction is very rare within Carabidae and generally within beetles.

Members of six genera occur in Australia, and that continent presently houses by far the largest number of species, whereas the pseudomorphine fauna of America is not yet well studied, but may be nearly as rich as that of Australia. Very few species of the genera *Sphallomorpha* Westwood, 1837 and *Adelotopus* Hope, 1834 have been recorded from New Guinea, Java, and the Moluccas, and one species of the genus *Cryptocephalomorpha* Ritsema, 1875 even occurs in southern Africa, whereas most species of this small genus live in northern Australia and southern and south-eastern Asia (Baehr 1992, 1997, 2009a, 2013).

In Australia the number of species and subspecies presently is 313, and pseudomorphine beetles occur in all parts of the country. Almost all species live either under the bark of bark shedding trees (mainly eucalypts) or in deep crevices in the bark of other trees, including non-eucalypts, in more or less open forest and woodland. But a few species even have invaded rain forest, where they may be found on the bark of moss covered trees. The habits of the single species of *Paussotropus* Waterhouse, 1877 and the single Australian species of *Cryptocephalomorpha* Ritsema, 1875 are not recorded, but it is suggested that all pseudomorphine species live in connection with ants, a few even with termites (Moore 1974, Baehr 1992, 1997). But actually this is recorded from only few species. The larviparous reproduction of most genera probably is likewise related to the myrmecophilous habits of the larvae. Similarly, the increased trend towards development of physogastric larvae in the higher evolved genera is regarded an adaptation to that mode of life.

### Taxonomic methods

In the taxonomic survey standard methods are used. For dissecting the female genitalia, the specimen was relaxed overnight in a jar under moist atmosphere, then cleaned for a short while in 10 % KOH. The habitus photograph was obtained by a digital camera using ProgRes CapturePro 2.6 and AutoMontage and subsequently was edited with Corel Photo Paint 14.

Measurements were taken using a stereo microscope with an ocular micrometer. Body length was measured from apex of labrum to apex of elytra, length of pronotum along midline, length of elytra in a straight line from the most produced part of the humerus to the most produced part of the apex.

For the chetotaxy which is very important for the identification of species of *Sphallomorpha*, the abbreviations as used in Baehr (1992) are repeated below.

The holotype of the new species will be stored in the Australian Museum, Sydney.

### Chetotaxy

supraorb	supraorbital seta (either side)
preorb	preorbital seta (either side)
clyp	clypeal seta (either side)
labr	labral setae (common)
ment.med	medial mental setae, at base of mental excision or mental tooth (common)
ment.lat	lateral mental setae, on wings of mentum (either side)
gloss	glossal setae, on ventral rim of apex of glossa (either side)

gul	gular setae, inside of gular suture (either side)
postorb	postorbital setae, posteriorly of eye on a conspicuous rim (either side)
suborb	suborbital setae, below eye, laterally of gular suture (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)
proeps	proepisternal setae, longitudinally and transversally on proepisternum (either side)
marg	marginal setae, along margin of elytra (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)

### Taxonomy

#### Genus *Sphallomorpha* Westwood

Westwood, 1837: 414. – For additional literature records and diagnosis see Baehr (1992).

**Type species.** *Sphallomorpha decipiens* Westwood, 1837, by monotypy.

**Diagnosis.** Wide, depressed species with prognathous head, elongate legs, comparatively complete chetotaxy, normal shaped, not foliaceous female gonocoxite, and not physogastric larvae. As far as it was recorded, all species of this genus are oviparous. In males the terminal sternum is excised, and in both sexes it bears a variable number of elongate setae at the apical margin.

**Note.** As Baehr (1994a) demonstrated, *Sphallomorpha* in many character states is plesiomorphic as compared with the other pseudomorphine genera, and thus it represents the adelphotaxon of all other genera of Pseudomorphinae.

The genus *Sphallomorpha* presently includes 159 species of which only 8 occur outside of Australia in New Guinea (Baehr 1992, 1993a,b, 1994a,b, 2002, 2004, 2005, 2006, 2008, 2009a,b, 2010, 2014, 2016). Species of *Sphallomorpha* usually are wide and rather depressed, they are either unicolourous black or piceous, or bear various, sometimes very vivid colour patterns on elytra and/or pronotum. In Australia they occur in a great variety of habitats, provided that some tree growth is present, but apparently they are very rare in rain forest. The Australian species are known to live under the loose bark of tree trunks of various eucalypts or in deep bark crevices

on rough-barked eucalypt and non-eucalypt trees. They are extremely agile, fast running beetles which fly deliberately, but are quite rarely encountered at light. The larvae of the very few species of which the larvae were recorded, apparently live by ants (Moore 1974), but are not decidedly physogastric as are the recorded larvae of the other pseudomorphine genera (Baehr 1997).

Baehr (1992) divided the genus into a number of putative monophyletic species groups which combine species that share certain synapomorphic character states of the external or genitalic morphology. The species described in the present paper does not belong to anyone group of the revision, according to the combination of certain character states of external and female genitalic morphology.

### *vratislavi* group

Medium sized, depressed, almost unicolourous species with evenly rounded, explanate basal pronotal angle; labrum wide, 4-setose, anteriorly barely excised; tooth of mentum prominent; mentum bisetose; gular sutures rectangular; glossa quadrisetose; antenna elongate, slender; supraorbital and preorbital setae present; anterior and posterior marginal setae of pronotum present; elytra with 15 marginal setae; female terminal sternum with 4–6 setae on either side; gonocoxite large and compact, acute, with 2 nematiform seta, but without dorso-medial and ventro-lateral ensiform setae.

A single species recorded from interior New South Wales.

**Systematic position.** This group is outstanding, because it combines external and genitalic character states of different species-groups. Particularly the chetotaxy of the dorsal and ventral surfaces and of the female gonocoxite is unique within the genus and excludes this group from all other groups within the genus.

### *Sphallomorpha vratislavi*, sp. nov.

**Figs 1, 2**

**Type material.** Holotype: ♀, "Australia, NSW, 8.Dec. 2007 Nombinnie NR., Mt.Hope 27 km SW 32°57'47.4"S, 146°06'35.4"E Allan M. Sundholm lgt. SetUp by Vr.R. -Colloredo-Mansfeld" (AMS).

**Etymology.** The name is a patronym in honour of Vratislav Beyšák. The specific epithet is a substantive in the genitive case.

**Diagnosis.** Medium sized, depressed, unicolourous black species, but with rufous lateral margins of



**Fig. 1.** *Sphallomorpha vratislavi*, sp. nov. Habitus (body length: 10.9 mm).

promotum and elytra; with distinct mental tooth, rectangular gular suture, barely excised labrum, and with extremely faint, barely visible elytral striae. The combination of the chetotaxy of the dorsal and ventral surfaces and of the female gonocoxite is unique within the genus.

### **Description**

**Measurements.** Length: 10.9 mm; width: 5.8 mm. Ratios: Width pronotum/head: 1.63; width elytra/pronotum: 1.06; width/length of pronotum: 2.48; length/width of elytra: 1.17; length elytra/pronotum: 3.09.

**Colour** (Fig. 1). Rather glossy black, only labrum, mouth parts, antenna, and tarsi rufous; lateral margins of pronotum and elytra wide, rufous translucent.

**Chetotaxy.** Supraorb: 1; preorb: 1; clyp: 1; labr: 4; ment.med: 2; ment.lat: 6–7; gloss: 4; gul: 2; postorb: 3; suborb: 9–10; pron.ant: 1; pron.post: 1; proeps: 1+2–3; marg: 15; stVI: 2; ♂ stVII: ?; ♀ stVII: 4–6.

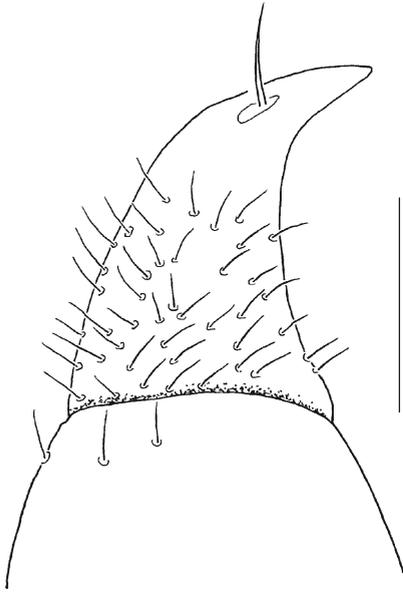


Fig. 2. *Sphallomorpha vratislavi*, sp. nov. Female gonocoxites (scale: 1 mm).

Head. Narrow in comparison to pronotum, short, fairly depressed, without distinct frontal impressions. Eye large but laterad barely projected. Clypeus almost straight, clypeal suture barely indicated. Lateral border of head very oblique, strongly convex, slightly incurved in front of eye. Labrum moderately wide, laterally convex, anteriorly straight, in middle barely excised. Mentum with distinct unidentate mental tooth. Wings of mentum wide, apex rounded, medially oblique. Glossa feebly excised, barely excavate, border obtuse. Dorsal part barely surpassing ventral, medially slightly excised, with few short hairs. Gular sutures strongly angulate. Terminal palpomere of labial palpus elongate, barely widened apicad, with oblique apex; terminal palpomere of maxillary palpus elongate, almost parallel-sided, apex slightly oblique. Antenna very narrow and elongate, median antennomeres c. 4 × as long as wide. Microreticulation of surface dense, extremely fine though distinct, isodiametric, minute punctures dense, but very difficult to detect within the micromeshes. Surface with a few indistinct striae inside of the eyes, with very sparse, short, erect pilosity, rather dull. Palpi very sparsely pilose. Galea with some very short hairs along anterior border and at apex. Ventral surface apparently impilose.

Pronotum. Very wide, moderately convex, triangular but slightly convex, lateral margins explanate.

Apex much narrower than base, with deep excision. Anterior angle projected, rather acute. Lateral margin evenly convex, widest immediately in front of the posterior marginal seta. Basal angle widely rounded. Base almost straight. Lateral margin anteriorly with distinct border line which becomes very fine towards base. Apex and base only laterally very finely bordered. No discal impressions visible. Microreticulation very dense and fine, slightly silky, isodiametric, minute punctures dense, barely perceptible, surface almost devoid of striae, with sparse, short, erect pilosity, rather dull.

Elytra. Rather short, slightly longer than wide, rather parallel-sided, widest about at middle, dorsally rather depressed. Lateral margin almost straight in slightly more than basal half, posteriad evenly convex, moderately explanate. Apex fairly wide, slightly oblique and faintly convex. Even the median striae barely perceptible. Series of marginal pores slightly spaced in middle. Microreticulation distinct, isodiametric, dense, slightly coarser than on head and pronotum. Punctures rather dense but almost invisible within the microreticulation. Surface with very sparse, short, erect pilosity, moderately glossy.

Lower surface. Prosternal process elongate, narrow, apex almost straight; ventral surface convex, straight to apex, bisetose. Metepisternum c. twice as long as wide at apex. Terminal abdominal sternum in female slightly convex.

Legs. Elongate and very slender. Metatarsus as long as metatibia. 1<sup>st</sup> tarsomere of metatarsus as long as 2<sup>nd</sup> and 3<sup>rd</sup> tarsomeres together. Squamosity of male protarsus unknown.

Male genitalia. Unknown.

Female gonocoxites (Fig. 2). Gonocoxite 1 elongate, apex with few setae. Gonocoxite 2 short and robust, triangular, apicad curved, with acute apex; ventral surface densely setose; without dorso-median and ventro-lateral ensiform setae, but with two attached, elongate, nematiform setae in apical third which originate from an elongate pit.

Variation. Unknown.

**Distribution.** Central New South Wales, Australia. Known only from the type locality.

**Biology.** Not recorded. Probably a bark inhabiting species like its congeners.

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