

THE PHASMID *PHENACEPHORUS SPINULOSUS*
(HAUSLEITHNER) FROM BORNEO,
INCLUDING A DESCRIPTION OF THE FEMALE

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ABSTRACT

The taxonomic status of *Phasgania spinulosa* Hausleithner is reviewed, concluding that the species belongs to the genus *Phenacephorus*. The differences between the abdomens of the males of *Carausius abbreviatus*, *C. mirabilis*, *Phenacephorus spinulosus* and *P. cornucervi* are illustrated. The female and egg of *P. spinulosus* are described and illustrated for the first time. The male is also illustrated and briefly described. Some notes on captive rearing are included.

INTRODUCTION

In July 1990 a collection of Phasmida was made in the area surrounding Mt Kinabalu National Park Headquarters in Sabah. The collection was made by searching the vegetation at night, using head torches. Two species of the genus *Phenacephorus* Brunner were collected and both were subsequently bred in captivity in the U.K. One species was found to be new to science at that time, and has since been described as *Phasgania spinulosa* by Hausleithner (1991).

The egg and female are described here for the first time and a short description of the male is also included. The terminology used in the description of the egg is the standard as defined by Clark (1976). Measurements of the egg are made to the nearest 0.1 mm and 0.01 mg. Measurements of the adults, which are given in Table 1, are made to the nearest 0.5 mm.

TABLE 1. — SIZE VARIATION IN *PHENACEPHORUS SPINULOSUS*.

Length (mm)	Male	Female
Head & body	49.5–51.0	56.0–60.5
Antennae	23.0–23.5	17.5–21.5
Head	2.5	4.0
Pronotum	2.5	3.0–3.5
Mesonotum	13.0–13.5	12.5–14.5
Metanotum and median segment	9.5	9.0–9.5
2nd–11th Abdominal segments	22.0–23.0	27.5–29.0
Fore tibiae	10.0–10.5	8.5–10.0
Fore femora	10.5–11.0	9.5–11.0
Mid tibiae	7.0–7.5	5.5–7.0
Mid femora	7.5–8.0	6.5–8.0
Hind tibiae	9.0–9.5	7.5–10.0
Hind femora	9.5–10.0	8.0–10.5

MATERIAL

Two females and four males of *P. spinulosa* were collected at night in the area around the National Park HQ. A pair were mating when found and were photographed before capture (fig. 1). The insects survived for about two weeks in captivity and 30 eggs were collected. These eggs were incubated and three specimens, one female and two males, were raised in the U.K. This species was identified from Hausleithner's (1991) illustration and description.

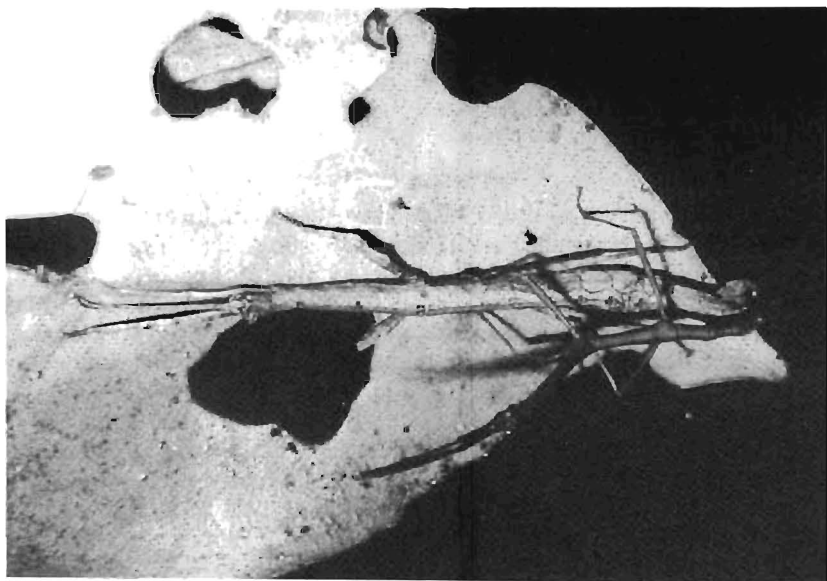


Fig. 1 — Photograph of mating pair of *Phenacephorus spinulosus*.

In addition to the specimens listed above, some collected in the Kinabalu National Park by Mr Allan Harman during the early 1980s were examined at the Natural History Museum, London.

Two pairs of *Phenacephorus cornucervi* Brunner were collected on Mt Kinabalu and subsequently reared in captivity. Specimens of *Carausius abbreviatus* (Brunner) were collected on Mt Serapi, Sarawak and subsequently reared in captivity (Bragg, 1992). A male specimen of *Carausius mirabilis* (Brunner), also from Mt Serapi, was borrowed from the Sarawak Museum.

TAXONOMY

Bradley and Galil's (1977) key places *P. spinulosa* in the family Heteronemiidae, subfamily Lonchodinae, tribe Lonchodini. This tribe

contains a large number of similar taxa, many of which are known from single specimens or specimens of only one sex. The tribe is without doubt in need of a fundamental revision.

Brunner (1907) distinguishes between *Carausius* Stål (= *Dixippus* Stål, = *Phasgania* Kirby), *Lonchodes* Gray (= *Hermagoras* Stål, = *Prisomera* Brunner, not Gray) and *Phenacephorus* Brunner by the presence of a lobe on the middle femora of the females of both *Lonchodes* and *Phenacephorus*, and by the presence of crests on the head of the females in *Phenacephorus*.

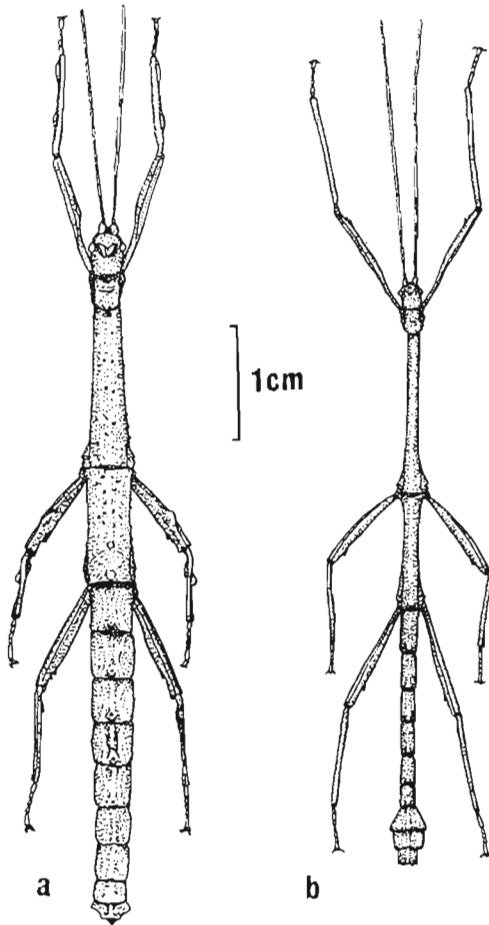


Fig. 2. — *Phenacephorus spinulosus* a. female; b. male.

Hausleithner (1991) described *Phasgania spinulosa* from a single male collected by C.L. Chan & L. Chin in 1981, females not being available. Hausleithner stated that this species is close to *Carausius abbreviatus* (Brunner) on the basis of a similarity between the swelling on the abdomen of the males of these two species. However the swelling of *C. abbreviatus* (fig. 5a) and that of the closely related *C. mirabilis* (Brunner) (fig. 5b) are almost circular; that of *P. spinulosus* is more angular (fig. 5d), suggesting a diamond or kite shape, similar to *P. cornucervi* Brunner (fig. 5c). The female has both lobes on the mid femora (fig. 3a) and a simple crest on the head (fig. 3b). This species should therefore be placed in the genus *Phenacephorus*.

Phenacephorus spinulosus (Hausleithner)

Phasgania spinulosa Hausleithner, (1991) *Nachr. ent. Ver. Apollo*, Frankfurt, N.F. 11(4): 230, fig. 9. (Holotype: Sinsuran, Sabah).

Phenacephorus spinulosus (Hausleithner), Bragg. (1991) *Phasmid Study Group Newsletter*, 48: 3.

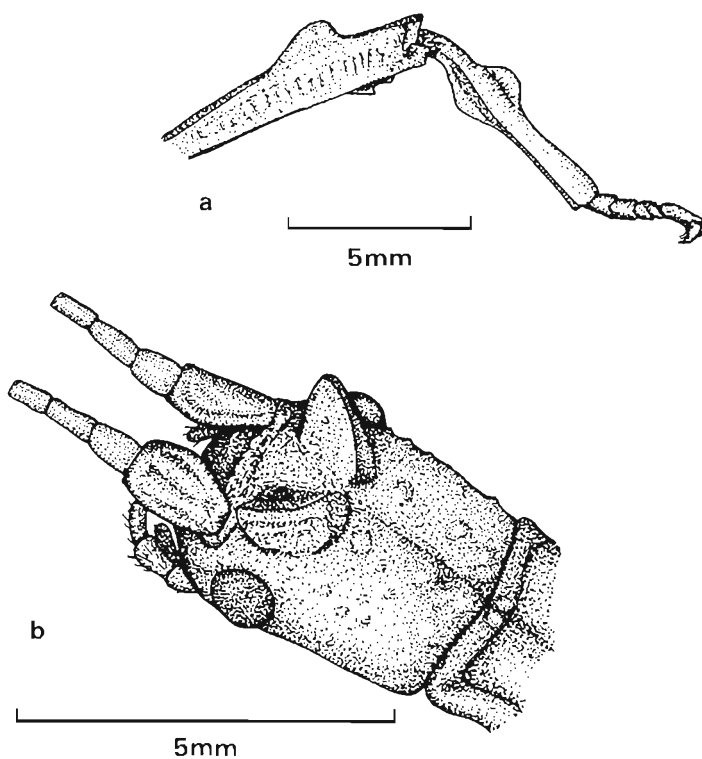


Fig. 3. — *Phenacephorus spinulosus*: a, midleg of female; b, head of female.

MALE (figs 1, 2b and 5d)

Body, head and legs mid brown and densely granulose, abdomen gradually changing to dark brown posteriorly. Head with two quite large spines which point forwards and outwards. Antennae with a flattened basal segment, a short, thick second segment, remaining segments uniformly thin and mid brown in colour throughout their length.

Thorax with median segment almost indistinguishable from the metanotum. Mesonotum, and abdominal segments 1-7 all have a swelling on the upper surface of the hind edge. This has the form of a blunt spine on the first six abdominal segments although on the median segment this may not always be particularly spine-like. The swelling on the 7th segment is little more than a tubercule. Eighth segment widens greatly at the hind end and the 9th narrows at the rear; together with the short 10th segment, they form a distinctive kite-shaped swelling on the end of the abdomen.

Legs simple except for two spines near the apices of the fore femora and two pairs of spines near the apices of each of the mid and hind femora. In each case the spine or pair of spines nearest the body are quite robust, those nearest the apices are small.

FEMALE (figs 1, 2a, 3a and 3b)

Body mid brown and densely, finely granulose, some black tubercules on thorax and black ridges along abdomen. Abdominal segments 5 and 6 sometimes very dark brown. The legs are mid brown with black speckles.

Head more or less flat, granulose and tuberculate. Between the eyes are two simple crests lying at an angle of about 45° to the midline, diverging anteriorly (fig. 3b). The crests are slightly curved and have a wide base. Antennae with basal segment flattened, a short, thick second segment and then uniformly thin; as long as the front legs, light to mid brown sometimes with darker patches.

Prothorax same width as head with a small but noticeable tubercule on the hind edge. Mesothorax covered in numerous black tubercules and widening only slightly posteriorly. Metathorax and median segment fused and not easily distinguished; both with some small black tubercules. There is a notable but small swelling at the hind edge of the median segment.

Abdominal segments 2-9 each with a small swelling at the hind edge, corresponding to the blunt spines of the male (although in the male they occur only as far as the 7th segment). Fourth segment with a dark brown or black carina running along the midline. Fifth segment with quite a large swelling on the upper surface, the size and shape of which varies. Tenth segment slightly wider at the hind edge; both 10th and 11th segments with a small carina running along the midline. Eleventh segment extremely short, forming no more than a minute triangle.

Operculum granulate, rugose, shallow, with a noticeable keel posteriorly extending to the end of the 10th segment.

Fore femora narrow at the base, widening out to become quite robust, with two or three apical ventral spines, one of which is quite powerful. Fore tibiae with a membrane running along length of upper surface, which widens slightly to form a lobe at each end. Both mid and hind femora with two pairs of subapical ventral spines, those nearest the body are quite large and strong. Mid femora short, strong, and with a rounded dorsal lobe (fig. 3a). Mid tibiae with two lobes about one third of the way along, the outer one forming a large rounded dorsal lobe while the inner is less prominent. Hind tibiae with a small inner lobe close to the femoral articulation and slightly thickened at the tarsal end.

VARIATION

Males show no significant variation and there appears to be little variation in females except for a slight difference in the size and shape of the swelling on the 5th abdominal segment. This lack of variation is in sharp contrast to *P. cornucervi*, a species in which the females are highly polymorphic, to the extent that it would be very unusual to find two females which look alike.

EGG (fig. 4)

Capsule uniformly dark grey, surface appearing pitted with tiny holes. Micropylar plate with a black rim and almost oval, but slightly wider at the polar end.

Length typically 2.3 mm long, 1.7 mm in height and 1.5 mm in width. Operculum very slightly concave with a dark brown capitulum. Opercular angle very small, circa $+1^\circ$. The mass of 70 eggs ranged from 2.40 mg to 3.28 mg with a mean value of 3.66 mg and a standard deviation of 0.39.

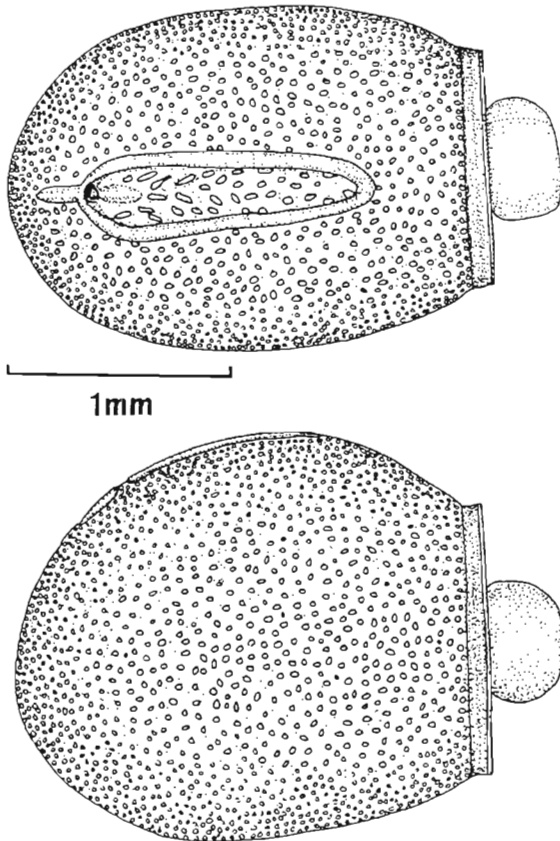


Fig. 4. — Egg of *Phenacephorus spinulosus*, dorsal and lateral views.

REARING IN CAPTIVITY

P. spinulosus may be reared in a standard cage (Bragg 1989) at high humidity (70–90%). It will readily feed on bramble (*Rubus* spp.), raspberry (*Rubus idaeus*), firethorn (*Pyracantha* sp.), dog rose (*Rosa canina*), ivy (*Hedera helix*) and flowering currant (*Ribes* sp.).

The thirty eggs of *P. spinulosus* collected in Sabah were incubated at ambient temperatures in the U.K.; from these eggs three adults were

raised, two male and one female. Males became adult some time before the female. The female produced only 87 eggs, and died before the males, so it is assumed that she did not live for a normal lifespan and would normally have produced more eggs.

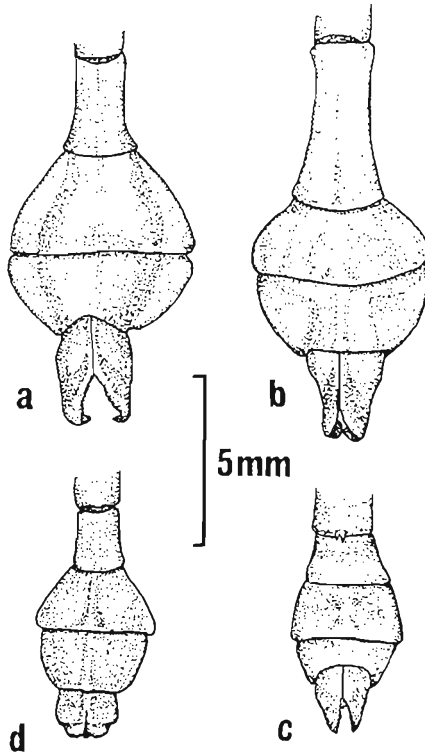


Fig. 5. — Abdomens of males: a, *Carausius abbreviatus*; b, *C. mirabilis*; c, *Phenacophorus cornucervi*; d, *P. spinulosus*.

ACKNOWLEDGEMENTS

I thank C.L. Chan for his kind hospitality during my visit to Sabah and the Sarawak Museum for the loan of a specimen of *Carausius mirabilis*.

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8 Cornwall Avenue, Beeston Rylands, Nottingham NG9 1NL.
December 3rd, 1991.

Planeustomus palpalis (Er.) (Col., Staphylinidae) from two Northamptonshire localities. — On 9th August 1977 I sieved a single male *Planeustomus palpalis* from leaf litter in a dried-up pond in Short Wood, a Northants Wildlife Trust Nature Reserve, 4 km NW of Oundle (ST 018912). The site was re-visited two days later but no further specimens were found.

During the summer of 1991 I have been operating an interception trap in my rural garden at Hemington, 6 km SE of Oundle (TL 091852). The trap was erected across a pathway between *Crataegus* bushes in the "wooded" part of the garden. There is an old field pond in the adjacent area of lawn. Between 20th and 23rd July 1991 I caught one male and two female *P. palpalis* in a water-filled tray, to which some detergent had been added, at the base of the fine mesh screen.

Tottenham (1954, *Handbk Ident. Br. Insects*, 4(8a)) described this distinctive oxyteline as "very rare, but occasionally taken in some numbers; a few scattered southern localities". Most of the specimens have been taken either by sweeping, often in the evening, beside small ponds or ditches, or from habitats similar to that in which the Short Wood specimen was found. Steel (1949, *Entomologist's mon. Mag.* 85: 50) recorded single specimens crawling on a garden path, beside a poorly drained lawn, at Palmers Green, Middlesex, in May 1941 and June 1943.

Fowler (1888, *The Coleoptera of the British Islands*, 2: 396) reported that this species had once been taken on the wing, and Twinn (1958, *Entomologist's mon. Mag.* 94: 233) lists it as one of the more common species collected in the early evening, between 20th June and 1st July 1952, from the white flysheet of a tent in the New Forest near Brockenhurst, Hampshire. The only other recent published record is that of Williams (1985, *Coleopterist's Newsletter*, 19: 3) who found one specimen of *P. palpalis* by tufting rushes in a partly dried-up pond in the middle of a field at Scadbury Park, Bromley, Kent, on 6th November 1983.

During the past eighteen years I have conducted an intensive survey of my garden for Coleoptera, including the marginal vegetation around the pond, without encountering *P. palpalis*. It is interesting, however, that a male and female *Atheia (Dilacra) vilis* (Er.) were taken from the same interception trap sample. Williams (loc. cit.) took this species in company with *P. palpalis*, and Horner recorded it as abundant with the several *Compsocbilus (Planeustomus) palpalis* which he collected with Blatch from one small damp spot near Tonbridge, Kent, in 1887 (*Entomologist's mon. Mag.* 24: 69). P.M. Hammond informs me that he knows of records of *P. palpalis* from fifteen 10 km squares in East and West Kent, South Hampshire, Surrey, Berkshire, Middlesex, Hertfordshire and North Essex. These two Northamptonshire localities provide a significant northerly extension to the known British range of this species. — R. COLIN WELCH, Institute of Terrestrial Ecology, Monks Wood Experimental Station, Abbots Ripton, Huntingdon, Cambs PE17 2LS: December 10th, 1991.