

PSG 146, *Centema hadrillus* (Westwood).

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Illustrations of adults and eggs by J. Potvin.

Key words

Phasmida, *Centema hadrillus*, Distribution, Sarawak, Brunei, Kalimantan, Borneo, Rearing.

This species was first described and illustrated by Westwood in 1859, based on four specimens from Sarawak, one adult and three nymphs. When establishing the genus *Lopaphus* (Westwood, 1859: 99), he commented that the genus was rather artificial and contained several different forms; since then the nine original species have been moved and now occupy eight different genera! *Centema hadrillus* appears to be quite common and has been mentioned several times in various publications.

Lopaphus hadrillus Westwood, 1859: 100, pl. 28.4.

Lopaphus (?) *hadrillus* (Westwood), Kirby, 1904: 360.

Centema hadrillus (Westwood), Redtenbacher, 1908: 490.

Centema hadrillus (Westwood), Günther, 1935: 11.

Centema hadrillus (Westwood), Günther, 1943: 155.

Centema hadrillus (Westwood), Bragg, 1993: 40. [Lectotype designated]

Centema longipennis Günther, 1944: 78. [Synonymised by Bragg, 1993: 40.]

Culture stocks

The PSG culture originates from two places: Badas in Brunei, and Simunjan in Sarawak. There are some differences between the two stocks and some people are keeping the two separate. The Simunjan stock originates from one female found by Ian Abercrombie and myself in 1991. The Badas stock was originally collected by Mel Herbert.

Distribution

This species seems to be widely distributed in Borneo and is common in some areas. I have collected it from eight localities, in Sarawak, Brunei and Kalimantan. The distribution map (Fig 1) shows my own records and one previously published record for Batu Tiban (Günther, 1935). I have been unable to locate the exact position of two localities mentioned by Günther: the Kapah river in north eastern Sarawak is in the area marked by a dotted line, and Smitan is somewhere on the river Mahakam in Kalimantan. The Sarawak Museum contains three specimens but only one gives a locality, Sadong, the river which runs through Simunjan.

At Tarum, in Sarawak (E 111° 28' N 001° 34') it was very common, with over a dozen specimens, a mixture of adults and nymphs, being seen on one evening. The Natural History Museum, London, contains several specimens collected by Allan Harman in 1980 from Niah National Park, Sarawak; I collected two females from the same locality in 1992. Mel Herbert has found *C. hadrillus* to be quite common at Badas, Brunei. In other localities where I have collected this species only single specimens have been found.

Adults (Fig 2)

Males and females are both quite spiny, however the number and size of the spines does vary. Both sexes have wings but the females have short wings which do not reach to the end of the second abdominal segment and are of no use for flight; the male has wings which reach to the end of the sixth abdominal segment and can fly quite well.

The head has spines on the top and back, although specimens from most places other than Simunjan

BORNEO

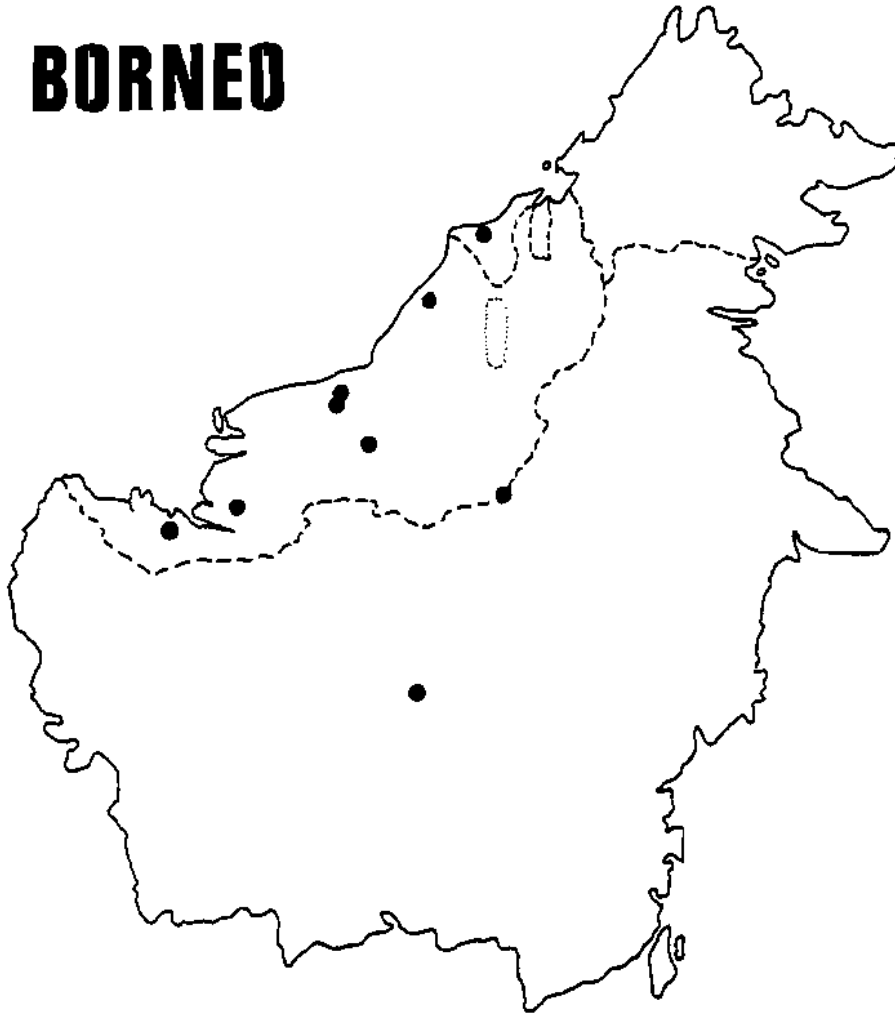
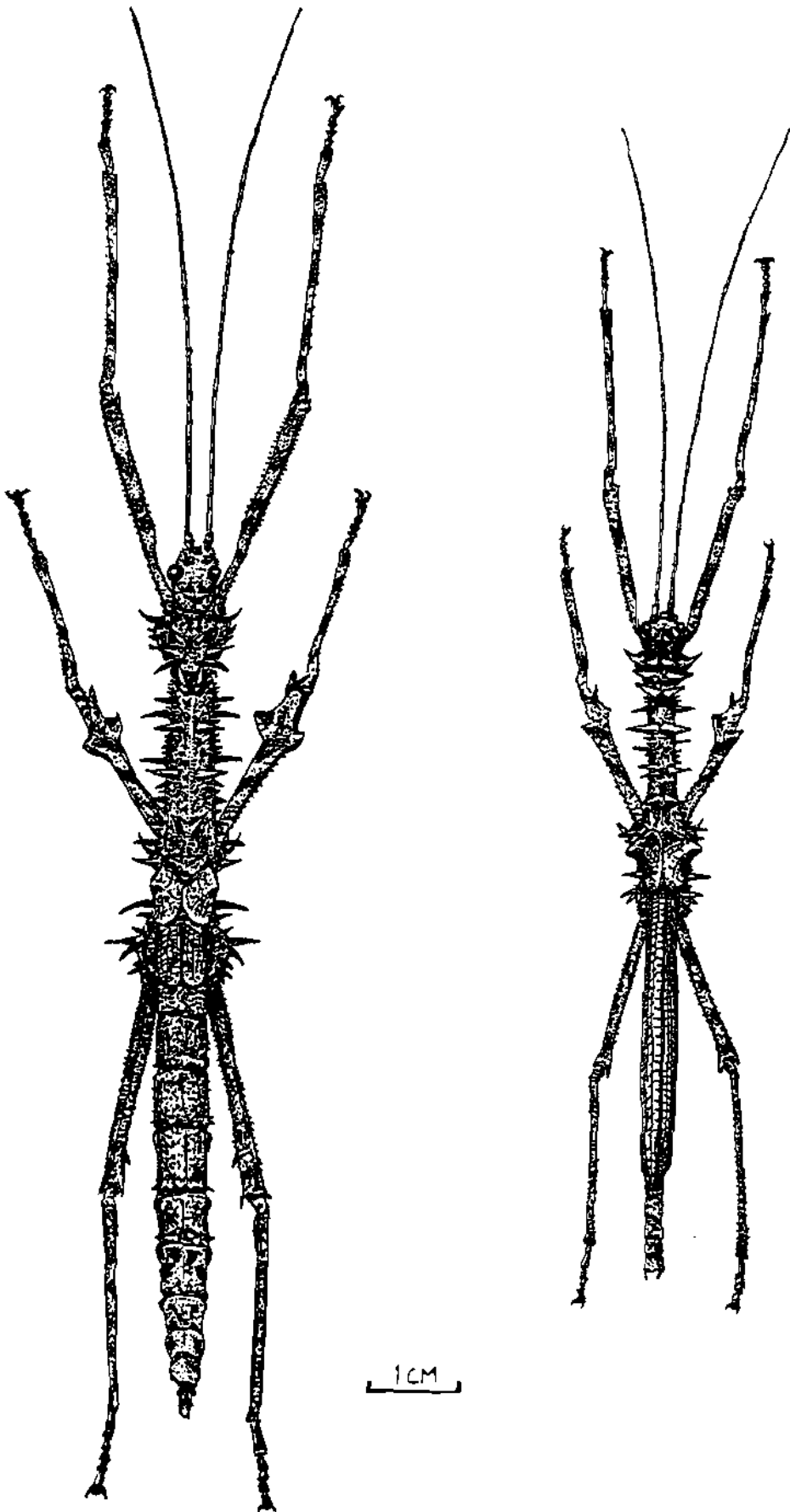


Figure 1. Distribution of *Centema hadrillus*.

in Sarawak have only very small spines; specimens from Simunjan have a pair of large spines and often several medium and small spines. The pronotum always has a pair of large spines near the front and a more widely spaced pair near the back, there are often other medium or small spines on the back half of the pronotum although this is another variable feature. The mesonotum has a large pair of spines at the front; the rest of the mesonotum is covered in variable numbers of spines, ranging from a few thin spines to numerous strong spines. There are no spines on the metanotum of either sex, or on the abdomen of the male, because they would damage the wings; the female has a few minute spines on the top of the abdomen. The sides of the thorax are spiny, particularly in the female.

The legs have no significant spines apart from the ends of the femora which have a small spine on each side of the joint with the tibiae. About two thirds of the way along the mid femora there are pointed lobes on both the upper and lower surfaces. The antennae are long, reaching beyond the ends of the front legs in both males and females. The female has an appendicular ovipositor (i.e. one formed by the operculum and ovipositor valves, not by the operculum and an elongated 11th tergum) and it is quite common to see an egg protruding from the ovipositor while she searches for a suitable place to deposit the egg.

Figure 2. *Centema hadrillus*, female and male.



Coloration varies greatly, the basic colour can be brown or green, but is often a mixture of both. A mottled appearance on the body is not uncommon and is usual on the legs. The leading edge of the wing is the same basic colour as the body, the folding part of the wing is translucent grey with brown veins. The males have a white mark on the elytra, usually a diagonal stripe or a triangle; in some specimens, particularly those from Simunjan, the white mark can be rather indistinct.

Nymphs

The pointed lobes on the mid femora are proportionally larger in the nymphs than in the adults. They are a useful characteristic for identification as the nymphs have very few spines and could be confused with other species.

Egg (Fig 3)

Capsule mid brown, micropylar plate dark brown or black. Capsule more or less cylindrical, tapering to a point at the polar end. The dorsal surface is flat, the lateral and ventral surfaces are slightly convex. The eggs vary in size but typically have the following dimensions: length 6.8mm, height 2.0mm and width 1.9mm. The opercular end has a ring of 0.5mm long hair-like projections. The operculum is circular and flat. The micropylar plate is almost oval but narrows at the opercular end.

The eggs take about four months to hatch if kept humid at about 25°C. The hatch rate can be quite high, Ian Abercrombie estimates about 80%.

Variation

There is considerable variation within this species, even within the same population. The spination of the head and thorax is particularly variable, as is the coloration of the insects. One interesting colour variation was noticed at Tarum: the females were predominantly brown and several female specimens had notable white markings. One specimen had white blotches on the elytra, leading edges of the wings and on the fifth to eighth abdominal segments; the seventh and eighth segments were completely white. A second specimen from Tarum was completely brown except for the margins of the wings and elytra and a white stripe running the length of the pronotum and front part of the mesonotum. The high proportion of brown specimens observed at Tarum could be due to the area being relatively dry compared to other areas where I have collected this species.

Rearing

Like most of the bornean species which are in culture, *C. hadrillus* needs quite humid conditions to do well; if kept dry they will soon die. It will feed on a variety of foodplants, including apple, bramble, cherry, oak, pyracantha, raspberry, and rose. Ian Abercrombie reports his eating apples, half an apple put in the cage would be eaten during the following few days. *Centema hadrillus* often eat the soft green stems of bramble in preference to the leaves and will also gnaw off the soft outer layer of harder stems. Ian also reports being bitten by the adults, both males and females;

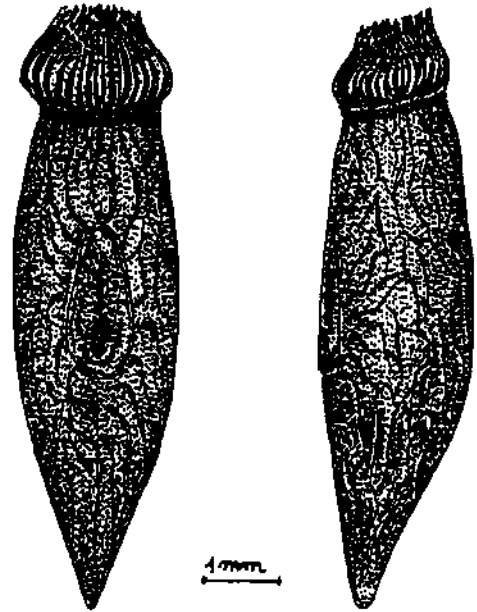


Figure 3. Egg of *C. hadrillus*, dorsal and lateral views.

although they readily bit through the skin they did not draw blood. Eggs are pushed into small cracks or laid into a suitable substrate, if there is no alternative they will lay the eggs on the ground. Ian Abercrombie recommends "Oasis" as the best medium for egg laying; other alternatives are "Vermiculite", peat or the plastic "Scotch pads"; all need to be damp. Ian has found that they will partly immerse themselves if given a bowl of water, this could be a reaction to being kept too dry.

Acknowledgements

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References

- Bragg, P.E. (1993) New synonyms and new records of phasmids (Insecta: Phasmida) in Borneo. *Raffles Bulletin of Zoology*, 41(4): 31-46.
- Günther, K. (1935) Phasmoiden aus Centralborneo. *Arkiv för Zoologi*, 28A(9): 1-29.
- Günther, K. (1943) Die Phasmoiden (Orthoptera) der "Borneo-expedition Dr. Nieuwenhuis" aus dem Stromgebiet des oberen Mahakam. *Eos Madrid*, 19: 149-172.
- Günther, K. (1944) Bemerkungen über indomalayische Stabheuschrecken (Orth.), besonders die Gattung *Haaniella* Kby. *Stettiner Entomologische Zeitung*, 105: 68-79.
- Kirby, W.F. (1904) *A synonymic Catalogue of Orthoptera*. Volume 1. British Museum (Natural History), London.
- Redtenbacher, J. (1908) *Die Insektenfamilie der Phasmiden*. Volume 3. Leipzig.
- Westwood, J.O. (1859) *Catalogue of the Orthopterous Insects in the Collection of the British Museum. Part 1: Phasmidae*. British Museum (Natural History), London.