

Illustrations and notes on the Phasmid *Diesbachia hellotis* (Westwood) from Borneo, including a new synonym

P.E. BRAGG, 8 Cornwall Avenue, Beeston Rylands, Nottingham, NG9 1NL, UK.

Key words: *Centrophasma hellotis*, *Diesbachia hellotis*, *Diesbachia approximata*, *Lopaphus hellotis*, new synonym, Sarawak, Borneo.

Introduction

Several specimens of a Phasmid were collected from Sarawak in 1989 and 1990. The species has previously been described under two different names in different genera. Both sexes and the egg are illustrated and the taxonomy of this species is discussed. All previous references to the species are listed below.

Diesbachia hellotis (Westwood, 1859).

Lopaphus hellotis, Westwood (1859) *Catalogue of the Orthopterous Insects in the Collection of the British Museum*. Part I: *Phasmidae*, p. 101, pl. XL, Fig. 1.

Lopaphus (?) *hellotis* Westwood, Kirby (1904) *A Synonymic Catalogue of Orthoptera*, 1: 360.

Centrophasma hellotis (Westwood), Redtenbacher (1908) *Die Insektenfamilie der Phasmiden*, 3: 489, pl. XXV, Fig. 7.

Centrophasma hellotis (Westwood), Günther (1932) *Wiener entomologische Zeitung*, 49: 316.

Centrophasma hellotis (Westwood), Bragg (1991) *Entomologist*, 110: 76-80. = *Diesbachia approximata*, Redtenbacher (1908) *Die Insektenfamilie der Phasmiden*, 3: 488. **NEW SYNONYM.**

Material

A number of adults and nymphs of this species were collected in July and August 1989 at two sites, Kampung Bengoh and Mt Serapi, in the First Division of Sarawak; most were brought back to the UK alive. A further specimen was collected on Mt Serapi in August 1990. On two occasions at Kampung Bengoh, mating pairs were collected. In captivity both adults and nymphs fed on Bramble (*Rubus* sp.) although, with the exception of one nymph, none survived more than a few weeks in the UK.

Identification

The identity of the females has been confirmed by comparison with the holotype in the Hope Museum at Oxford. The identity of the males was determined by use of Redtenbacher's keys (Redtenbacher 1908) and the synonymy confirmed by examination of a

Table 1. The range of measurements for *Diesbachia hellotis*. *the antennae of this specimen are incomplete.

Sizes (mm)	Male	Female
Head	3.5-4.5	5.5-6
Antenna	53*-90	77-95
Pronotum	3.5-4.5	6-7
Mesonotum	14-19	23-27
Metanotum & median segment	10-12	12-14
Total body length	74-96	108-123
Fore femora	27-34	33-40
Mid femora	18-22	23-27
Hind femora	27-32	34-39
Fore tibiae	29-39	40-46
Mid tibiae	20-26	27-32
Hind tibiae	30-39	40-46

photograph of the type specimen which is in the Vienna Museum.

There is no doubt that the nymphs collected are also of this species; they were collected at various stages of development and one small male nymph was successfully raised to adulthood. This specimen produced a spermatophore (Bragg 1991) although there were no females of this species in the cage at that time. It is also the smallest recorded specimen (Table 1); perhaps as a result of being reared at an unnaturally low temperature or possibly due to dietary deficiencies.

Colouration

The nymphs are predominantly green in colour, becoming darker and developing brownish-green colouration as they progress through the instars. A clearly visible pale brown, or often white, band two thirds of the way along the mid femora seems to be characteristic of this species at all stages.

The body of the adults is a uniform dark brown in both sexes. The bases of all femora in the female are pale and there is often a white band on both the mid and hind femora, about two thirds of the way along. The rest of the legs in the female are dark brown or black with a few pale brown bands. The legs of the male are similar to those of the female but the bases of the femora are not pale and the white bands referred to in the female are pale brown in the male.

The bases of the elytra can be green with a distinct black triangle in living female specimens; the costal areas of the hind wings are dark brown and may be speckled with green. The elytra and the costal area of the males' hind wings are light brown with dark veins.

The hind area of the wings in all specimens of both sexes, except for Westwood's holotype, are brown with large pink spots which merge with each other to produce a marbled effect. Westwood described the hind area of the wings as "dirty white, slightly tinged with

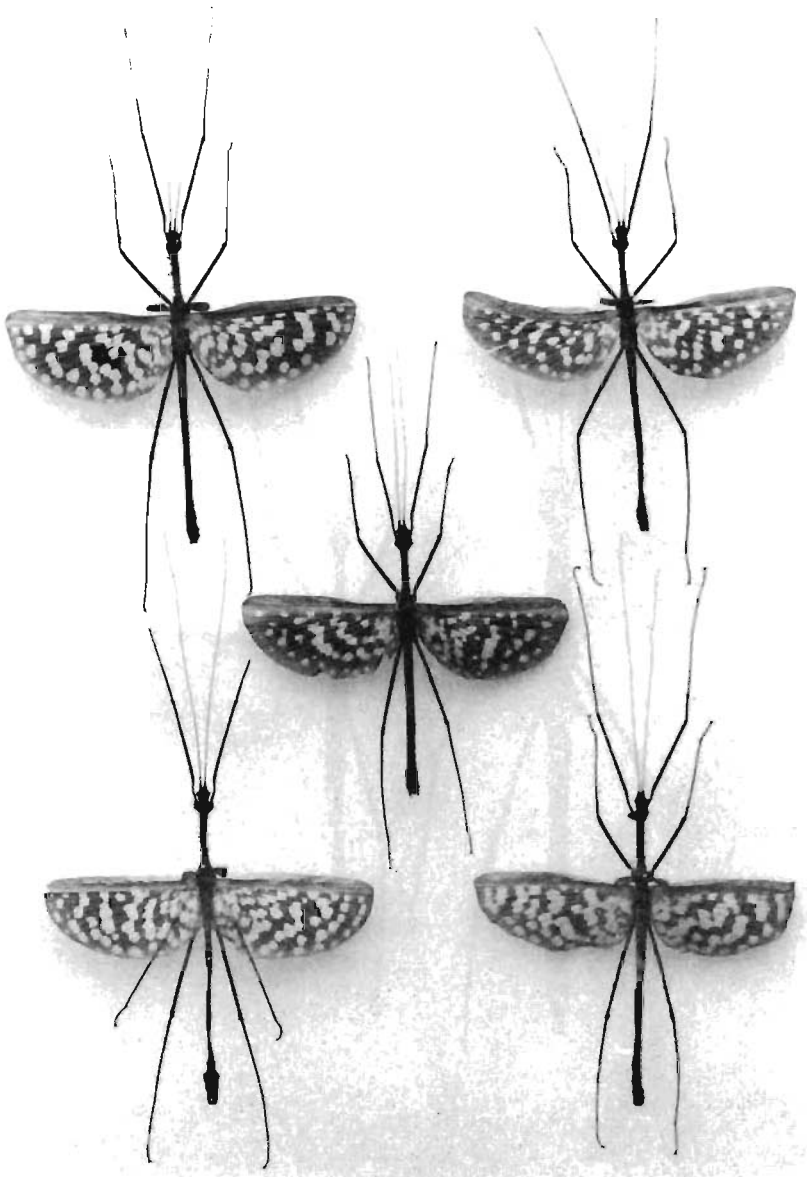


Fig. 1. Males of *Diesbachia hellotis*.

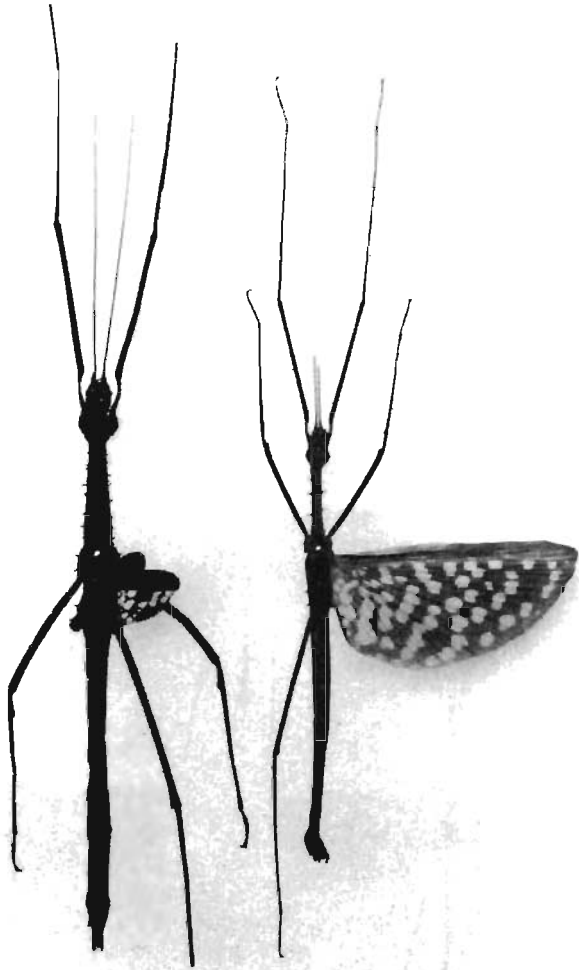
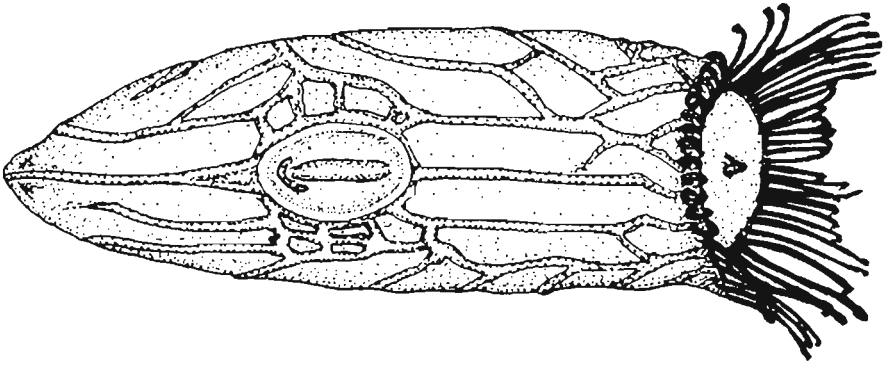


Fig. 2. Male and female of *Diesbachia hellotis*.



1mm

Fig. 3. Egg of *Diesbachia hellotis*.

pink and with several brownish clouds". This is clearly a result of fading due to poor preservation of storage conditions and this may also explain the legs which were missing when Westwood described the specimen. It is worth noting that I found this species easily shed its legs when kept in captivity.

The variation in the pattern on the wings of the males can be seen in Fig. 1 and the mottled pattern of the wings of the female can be seen in Fig. 2.

The Egg

The eggs are roughly cylindrical, but come to a blunt point at the end opposite the operculum. They are dark brown in colour and have a series of irregular ridges running over the surface. The operculum is flat, with a small blunt spine near the centre and is surrounded by a ring of thick hair-like structures; the opercular angle is about $+8^\circ$. A typical egg has the following dimensions, length 6.5mm, height 2.5mm, and width 2.1mm. Eggs were deposited on the floor of the cage although it seems likely from the shape that they would normally be inserted into some medium, possibly soil or perhaps cracks in the bark of trees.

Taxonomy

Westwood placed this species in *Lopaphus* Westwood although at the time he was not fully satisfied with the genus. This is clear from the comment he made following the description of the genus: "This group is evidently an artificial one, containing several distinct types of form — all, however, distinguished by possessing rudimental or short wings and

wing covers." Kirby left the species in *Lopaphus*, with some reservations (Kirby, 1904).

The species which Westwood originally placed in *Lopaphus* have since been moved by various authors (including: Kirby, 1904; Redtenbacher, 1908; Karny, 1923). *Lopaphus*, as defined by Karny in his corrections to Redtenbacher's monograph (Karny, 1923), contains only species which have reduced wings in both sexes. The females of *Lopaphus* do not have a long ovipositor unlike the species currently under consideration.

Redtenbacher placed the female in *Centrophasma* Redtenbacher and the male in *Diesbachia* Redtenbacher. *Diesbachia* is described as having full sized wings in both sexes; *Centrophasma* is described as having shortened wings in both sexes and as having a unicoloured hind area. Thus, strictly according to the descriptions of these two genera given by Redtenbacher, this species belongs in neither genus.

As I have stated above, the wing colouration of *Lopaphus hellotis* was wrongly described. In addition, the other two species which Redtenbacher placed in *Centrophasma* both have males with short wings which is not the case with this species. Clearly the genus *Centrophasma* is inappropriate for this species.

The male of this species is very similar to *Diesbachia tamyris* (Westwood) in both colour and form, the distinction being the greater number of spines on the pronotum of *D. tamyris*. I consider the species to be wrongly placed in *Centrophasma* and move it into *Diesbachia* as *Diesbachia hellotis* (Westwood); the criteria for the genus *Diesbachia* should be modified to include species which have reduced hind wings in the female.

Distribution

The original descriptions of *Lopaphus hellotis* and *Diesbachia approximata* both give the habitat as Borneo, with no specific locality given in either case. Günther (1932) reports one female *Centrophasma hellotis* from 460m on Mt Kinabalu, Sabah.

I have found *Diesbachia hellotis* to be quite common on small trees and shrubs growing amongst rocky outcrops at Kampung Bengoh; the area surrounding the outcrops consisted largely of Cocoa plantations. A few specimens were found at altitudes ranging from 120m to 580m along the sides of the road which goes up Mt Serapi.

It is surprising that a species which appears to be quite common, at least in part of Sarawak, has only been reported in the literature on three previous occasions. I have checked in the Natural History Museum, Hope Museum, Cambridge University Museum and in the Sarawak Museum and have found only one specimen, a female, in the Sarawak Museum, collected at Matang in May 1902, other than the Holotype. Table 1 gives the range of measurements from seven males and four females in my collection. Lengths of regenerated legs have not been included. The male nymph which was reared to adult is considerably smaller than the wild-caught males and has broken antennae. There is considerable variation in the length of the legs of several specimens, the corresponding left and right legs of a single specimen may differ by several millimetres even when the legs do not appear to have been regenerated.

Dispersal of Material

It is my intention to distribute specimens in the following manner: An adult pair and nymph to the Natural History Museum, London. An adult pair and nymph to the Sarawak Museum, Kuching. An adult male to the Hope Museum, Oxford.

Summary

The male and egg of *Diesbachia hellotis* are illustrated for the first time. A correction is made to the description of the female which is also illustrated. The male has previously been described as *Diesbachia approximata*. The nymphs of this species are briefly mentioned. The taxonomic status and distribution are discussed.

References

- Bragg, P. E. (1991) Spermatophores in Phasmida, *The Entomologist*, **110**: 76-80.
- Günther, K. (1932) Phasmoiden des Kina Balu auf Borneo, aus dem Hamburger Zool. Museum, *Wiener entomologische Zeitung*, **49**: 313-320.
- Kirby, W. F. (1904) *A Synonymic Catalogue of Orthoptera*. vol. 1. London.
- Karny, H. H. (1923) Zur Nomenklatur der Phasmoiden. *Treubia*, **3**(2): 230-242.
- Redtenbacher, J. (1908) *Die Insektenfamilie der Phasmiden*, vol. 3. Leipzig.
- Westwood, J. O. (1859) *Catalogue of the Orthopterous Insects in the Collection of the British Museum. Part I: Phasmidae*. The British Museum, London.

ENTOMOLOGICAL CLUB GRANTS

The Entomological Club has a small income from investments and through the generosity of members attending its annual Verrall Supper. Grants are made to assist entomologists studying British insects. The Club would need to be satisfied that the line of work would lead to publication and that it is not fundable elsewhere. Grants would not exceed £200

Applications should be addressed to Claude Rivers, The Entomological Club, 17 Cumnor Rise Road, OXFORD, OX2 9HD.