

## NEW SYNONYMS AND NEW RECORDS OF PHASMIDS (INSECTA: PHASMIDA) IN BORNEO

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**ABSTRACT.-** Five species of Phasmida which have not previously been recorded from Borneo have been found in Brunei, Sarawak and Sabah. One species, *Planispectrum bengalensis* (Redtenbacher, 1906), represents a genus which is previously unrecorded from Borneo. Six new synonyms are given and an old synonym is corrected. The eggs of *Asceles conicipennis*, *Sosibia peninsularis* and *Orthonecrosia pulcherrima* are described and illustrated for the first time. The lectotypes of four species, *Asceles acutegibbosus* Redtenbacher 1908, *Ocellata atosignata* Redtenbacher, 1908, *Lopaphus hadrillus* Westwood, 1859, and *Platymorpha bengalensis* Redtenbacher, 1906, are designated.

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### INTRODUCTION

In July and August 1991, collections of Phasmida were made in Brunei and Sarawak, and in 1990, a collection was made in Sabah. In July and August 1992, collections were made in various parts of Sarawak and Sabah. These collections, in conjunction with examination of specimens in four museums, the Sarawak Museum, Kuching, Sarawak (SM), the Hope Collection at Oxford University Museum (OXUM), the Naturhistorisches Museum Wien, Austria (NHMW) and the Natural History Museum, London (NHM), have led to the discovery of five species of phasmid which have not previously been recorded from Borneo. One of these species has been found in Borneo previously, but was recorded under the wrong name as the result of an incorrect synonym which is corrected in this paper. In addition, six new synonyms were determined, in one case the senior name has also not been recorded from Borneo. Attempts to rear three of these species in the United Kingdom (UK) were successful in one case and unsuccessful in the other two. The eggs of three species are described for the first time; terminology used is that of Clark (1976).

### METHODS AND MATERIALS

At all locations, specimens were collected at night by searching low growing vegetation using headtorches. The Sarawak material was collected in seven areas: 4.5 miles from the centre of Kuching, near Bau, on Mt. Serapi and on Mt. Santubong in the Kuching Division, Simunjan in

the Samarhan Division, Pelagus River in the Kapit Division, and Niah National Park in the Miri Division. All these areas contain a mixture of secondary and primary rainforest with the exception of Kuching and Bau which are secondary forest. An earlier collection on Mt. Serapi in 1989 had also resulted in the collection of two males of *Calvisia conicipennis* Bates, however these were not identified at that time. All specimens in my personal collection are given an individual accession number which is preceded by my initials and a hyphen e.g. PEB-1234.

The Brunei collection was made as part of the University of Brunei Darussalam/Royal Geographical Society Brunei Rainforest Project at Kuala Belalong in the Temburong district of Brunei; this is an area of primary rainforest.

The SM phasmid collection was examined during July and August 1991, a single specimen of *Planispectrum* was identified; in August 1991 a similar specimen was borrowed for further examination from OXUM. In August 1992 a further specimen was identified in the collection of C.L. Chan of Kota Kinabalu, Sabah.

#### SUBFAMILY NECROSCIINAE BRUNNER VON WATTENWYL, 1893

##### *Asceles conicipennis* (Bates, 1865)

(Figs. 1-3)

*Necrosia conicipennis* Bates, 1865: 358.

*Trigonophasma conicipennis* - Kirby, 1904b: 372.

*Asceles conicipennis* - Redtenbacher, 1908: 496.

*Calvisia maculata* Kirby, 1904a: 435. New synonym.

*Calvisia maculata* - Kirby 1904b: 369.

*Asceles acute-gibbosus* Redtenbacher, 1908: 496. New synonym.

**Material examined.**- Holotype (*N. conicipennis*) - female (OXUM), Sumatra. - Holotype (*C. maculata*) female (NHM 96-126), Penang, West Malaysia.

Lectotype (*Asceles acute-gibbosus*) - female (here designated) (NHMW), Kinabalu, Sabah, Borneo, coll. Rolle.

Paralectotypes (*A. acute-gibbosus*) - 1 male (NHMW), Kinabalu, Sabah, Borneo, coll. Rolle. - 1 male (NHMW 22.757), Borneo. - 1 male (NHMW 11.025), Borneo, coll. Frivaldsky.

Others - 2 males (PEB-916, PEB-917), Mt. Serapi, Sarawak, coll. P.E. Bragg, 12.viii.1989. - 1 female, 2 males (PEB-899, PEB-906, PEB-910), 150m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 26.vii.1991. - 3 females, 3 males (PEB-902, PEB-904, PEB-1007, PEB-907, PEB-914, PEB-1008), 760m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 27.vii.1991. - 1 female (PEB-1401), 100-760m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 12.viii.1991. - 1 male (PEB-1400), Simunjan, Sarawak, coll. P.E. Bragg, 17.viii.1991. - 1 male (PEB-782), 640m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 19.viii.1991. - 1 female, 2 males (PEB-900, PEB-901, PEB-903), 100-760m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 21.viii.1991. - 1 male (PEB-908), 270m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 21.viii.1991. - 1 male (PEB-915), 700m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 21.viii.1991. - 1 female, 3 males (PEB-905, PEB-911, PEB-912, PEB-913), 760m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 21.viii.1991. - 1 male (PEB-1539), 4.5 Mile, Kuching, Sarawak, coll. P.E. Bragg, 28.vii.1992. - 1 female (PEB-1578), 700m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 14.viii.1992.

**Remarks.-** At NHMW, there are four male and one female specimens bearing a label which reads “det. Br. v. W. *Asceles acute-gibbosus*”. The female which I select as the lectotype bears four labels; uppermost, a small pink rectangle with no writing; secondly, a white label which reads “Coll Br. v. W. Kina Balu Borneo, Rolle”; thirdly the determination label; fourthly a red lectotype label added by myself. One of the four males, which bears a blue label numbered “25.630” and a white label “coll Br. v. W. Kina Balu Borneo, Rolle” in addition to a determination label, is clearly a specimen of *Asceles margaritatus* Redtenbacher 1908, a species which is stored in the same drawer. Redtenbacher (1908: 496) did not state the number of specimens he used to describe the species and I assume that this is a labelling error not an error of identification; I have added a new determination label. Of the three males which I consider paralectotypes, one bears an identical locality label to the holotype; the other two just give the locality as “Borneo”, one also gives the collector’s name “Frivaldsky”.

Bates (1865: 358) described the swellings on the mesonotum of *conicipennis* as “... having only two faintly elevated and obtuse tubercles in the middle”; Kirby (1904a: 453) describes his specimen as having “... the hinder two thirds suddenly raised”. Examination of the specimens shows that Bates and Kirby were referring to the same type of structure, the description

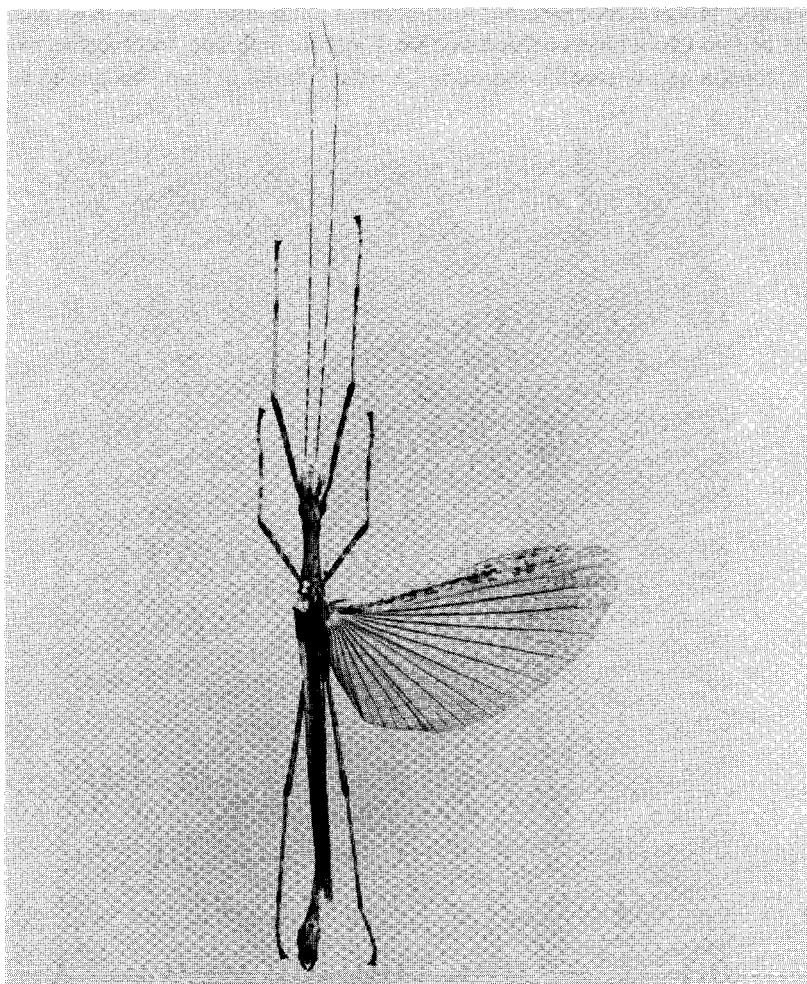


Fig. 1. Male *Asceles conicipennis* (length = 45mm).

of Kirby being the better of the two. It seems likely that Kirby had not examined *conicipennis*, if he had done so he would have realised that *maculata* is the same species and certainly would not have placed them in different genera (Kirby, 1904b).

Kirby's (1904a) *maculata* was not included by Redtenbacher (1908) in his monograph. It is also clear that he did not examine the type specimen of *conicipennis* as he gave only two of the measurements which are given in Bates' description. Redtenbacher's (1906, 1908) usual practice was to give six measurements for the species he had examined, of those that he usually gave only two are included by Bates. In addition Redtenbacher made a mistake when converting Bates' imperial measurements into metric measurements. As a result he gave the mesonotum as 16mm instead of 9.5mm. Redtenbacher's (1908: 293-295) key to *Asceles* does not distinguish between *A. acutegibbosus* and *A. conicipennis* but he adds a note at the end of the description of *A. acutegibbosus* to say that the two species probably belong together.

The generic position of this species is not clear. Redtenbacher's (1908) key places it in *Asceles* Redtenbacher, 1908, by virtue of the curve at the base of the front leg; without this curve, which is only slight, the species would be placed in *Calvisia* Stål, 1875. The swellings on the mesothorax are typical of other species of *Calvisia*, although less pronounced. The egg of this species is unlike that of *A. margaritatus* Redtenbacher but is similar to that of an unidentified species of *Calvisia* which I have collected on Mt. Kinabalu in Sabah. Until further evidence is available to support transferring this species to *Calvisia*, I choose to leave this species in *Asceles*.

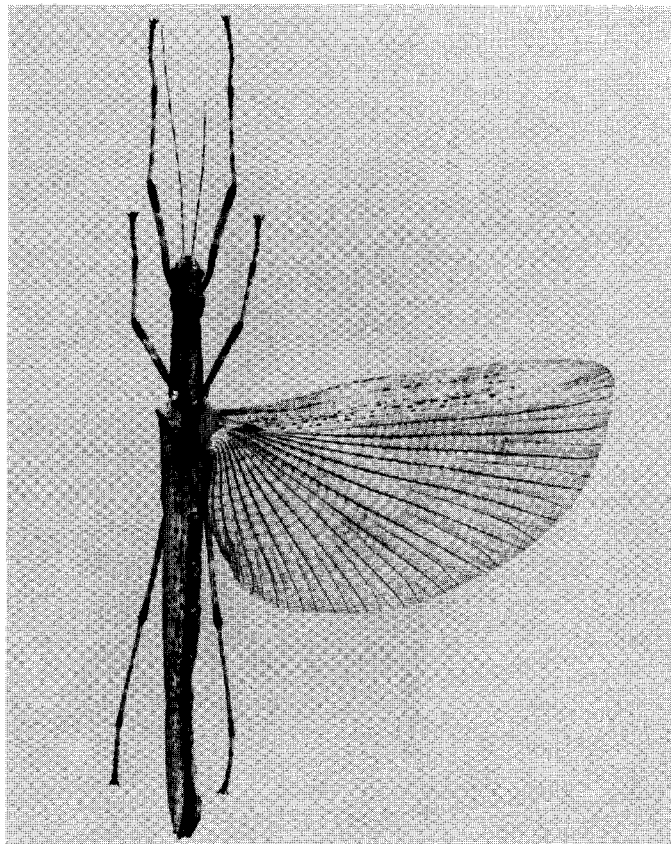


Fig. 2. Female *Asceles conicipennis* (length = 65mm).

This species has been found to feed on *Eucalyptus gunnii* in captivity in the U.K. The eggs are laid in a string of two to six and are attached to the stems of plants. The eggs hatched after about five weeks in the U.K. (ambient temperatures, August & September) but the newly hatched nymphs had difficulty feeding and a culture of this species has not been established.

The nymphs are straw-yellow in colour and have the following measurements: head 1mm, thorax 7.0mm, abdomen 6.5mm, foreleg 10.5mm, midleg 8.5mm, hindleg 12.0mm, antennae 17.0mm.

Kirby's type specimen has less black coloration on the forewings than the specimens from Sarawak.

**Description of the egg** (Fig. 3). - Egg stuck to plant stems by ventral surface; to other eggs by dorsal and polar end. Laid in rows of two to six.

Capsule twice as long as wide; cross section almost square, with rounded corners; polar end rounded; anterior concave, with deep rim angled 20° degrees away from the dorsal surface. Capsule mainly beige occasionally with mid brown patches. Lateral surfaces with wide, dark brown, longitudinal stripe. Ventral surface with mid to dark brown ring surrounding the part which is glued to the substrate.

Operculum at anterior end of dorsal surface (opercular angle +90°), oval, mid brown, without capitulum. Capsule and operculum with numerous small pits. Micropylar plate at polar end of dorsal surface; small, oval, beige, micropylar cup in centre. Median line creamy beige, half the width of micropylar plate, leading to distinct, circular, polar area. Capsule height 1.6mm, width 1.6mm, length 3.3mm; operculum length 1.3mm, width 1.1mm.

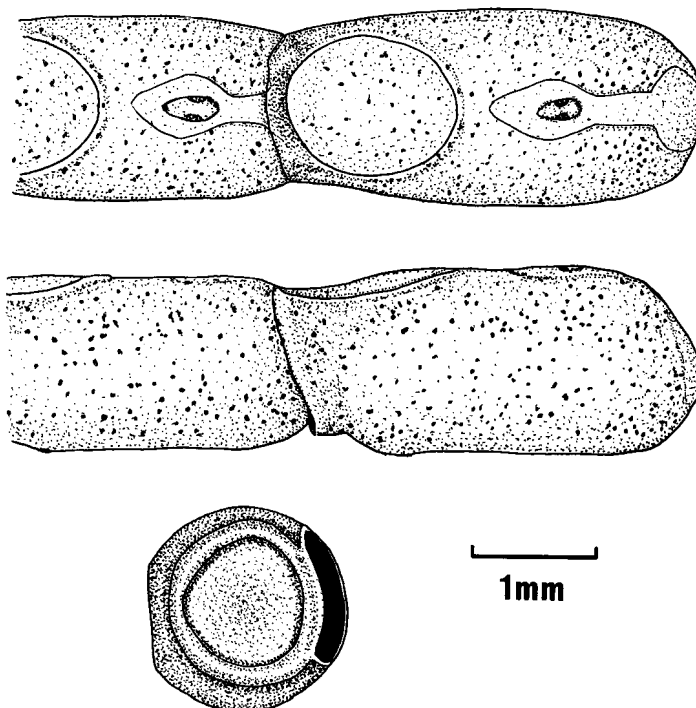


Fig. 3. Egg of *Asceles conicipennis*.

***Sosibia peninsularis* Kirby, 1904**  
(Figs. 4-6)

*Sosibia peninsularis* Kirby, 1904a: 434.

*Sosibia peninsularis* - Kirby, 1904b: 368.

*Sosibia curtipes* - Günther, 1943: 161, [not Westwood 1848: 79., misidentification & erroneous synonym].

**Material examined.**- Holotype (*Sosibia peninsularis*) - female (NHM 96-126), Penang, West Malaysia. - Holotype (*Phasma (Necrosia) curtipes*) - female (OXUM), Prince of Wales Island, coll. Dr. Cantor.

Others - 1 female (Leiden Museum), Mahakam, Borneo, coll. Nieuwenhuis, 1894. - 1 female (PEB-498), 50m, Kuala Belalong, Temburong District, Brunei, coll. P.E. Bragg, 12.viii.1991.

**Remarks.**- Examination of the type specimens of *S. curtipes* (Westwood, 1848) and *S. peninsularis* Kirby, 1904, clearly shows that Günther's (1943: 161) synonym is incorrect. Günther recorded two specimens collected by Dr. Nieuwenhuis in 1894 from Mahakam, and Long Bloe Oe, Borneo, when he synonymised the species (Günther 1943). I have examined Günther's specimen from Mahakam; it is 4mm longer and has a broader thorax, otherwise it is identical to the holotype of *S. peninsularis*. The sizes recorded by Günther (1943: 163) for the Long Bloe Oe specimen are similar. *S. curtipes* should therefore not be considered as a Bornean species. It is worth noting that *S. peninsularis* was omitted from Redtenbacher's monograph (1908).

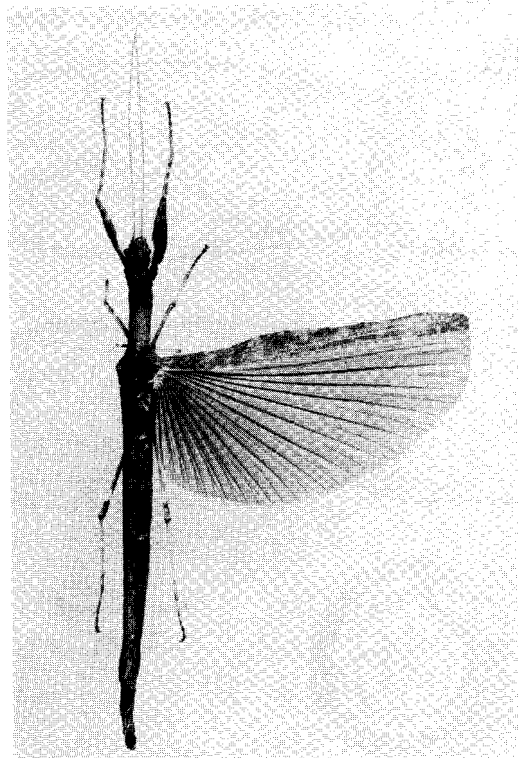


Fig. 4. Female *Sosibia peninsularis* (length = 94mm).

My specimen (Fig. 4) agrees in every respect with Kirby's type specimen. It differs from *curtipes* in five major respects, these are summarised in table 1.

The mesothorax of *peninsularis*, with the exception of one small pair of spines at the anterior, is granulose, while that of *curtipes* is very spiny. The mesothorax of *curtipes* is much longer relative to the body length than that of *peninsularis*. The fore femora of *peninsularis* are much shorter and they have different shaped lobes (see Fig. 5a, b). The elytra are greatly lobed in *curtipes*, in *peninsularis* they are only ridged (see Fig. 5c, d).

Table 1. Summary of the differences between *S. peninsularis* and *S. curtipes* (measurements to nearest 0.5mm)

	<i>S. curtipes</i>	<i>S. peninsularis</i>
Mesonotum	Very spiny	Granulose except for a pair of spines on the anterior margin.
Mesonotum length	15mm	10.5mm
Anterior femora length	18mm	13mm
Anterior femora lobes	Upper and lower lobes of similar size. (Fig. 5b)	Upper lobe small. Lower lobe large. (Fig. 5a)
Fore wings	Large hump. (Fig. 5d)	Ridged, not humped. (Fig. 5c)

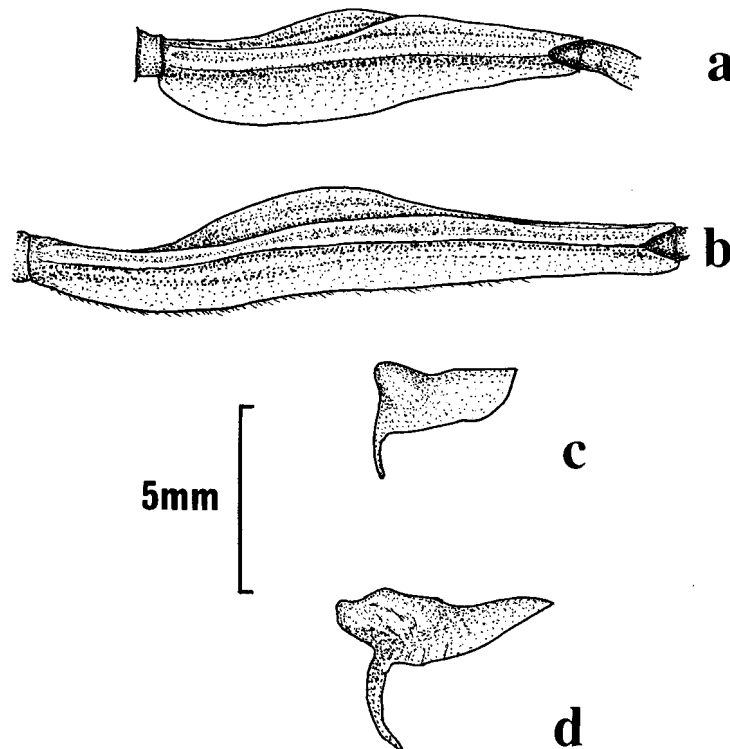


Fig. 5. a, *S. peninsularis*, left fore femur; b, *S. curtipes*, left fore femur; c, *S. peninsularis*, left elytron viewed from the rear; d, *S. curtipes*, left elytron viewed from the rear.

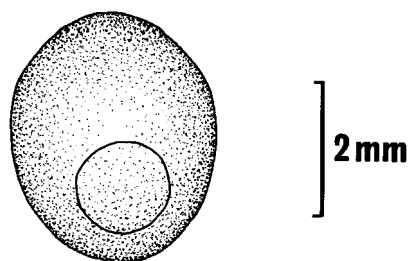


Fig. 6. Egg of *Sosibia peninsularis*.

**Description of the egg** (Fig. 6).- The eggs are almost spherical, smooth, black and very shiny. The only two eggs I have were removed from the body of the female after she had died. One of these appears to be fully formed, the other has a translucent shell and is obviously not fully formed; other eggs removed from the body had so little shell that they could not be removed intact. The eggs are almost featureless. The circular operculum was difficult to find because it is indistinct and it was only possible to make out the shape on the egg which is not fully developed. Figure 4 shows the relative size of the operculum of the partly formed egg. I was unable to find any evidence of a micropylar plate on the outside of the eggs and have not made an internal examination. The maximum and minimum measurements of the fully formed egg are as follows: 3.4mm, 3.0mm.

### ***Orthonecrosia pulcherrima* Kirby, 1904**

*Orthonecrosia pulcherrima* Kirby, 1904a: 436.

*Orthonecrosia pulcherrima* - Kirby, 1904b: 374.

*Ocellata atrosignata* Redtenbacher, 1908: 554. New synonym.

*Ocellata tessellata* Redtenbacher, 1908: 554, (Holotype female, Borneo, [specimen destroyed]). New synonym.

*Orthonecrosia tessellata* - Günther, 1932: 71.

**Material examined.**- Holotype (*O. pulcherrima*) - female (NHM 79-39), Borneo.

Lectotype (*O. atrosignata*) - male (here designated), (NHMW), Borneo. [Paralectotype(s) male (specimens destroyed) Borneo.].

Others - 1 female (PEB-919), 90m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 13.viii.1990. - 1 nymph (PEB-936), hatched from egg laid by PEB-919. - 1 female (PEB-918), 790m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 27.vii.1991. - 1 male (PEB-925), 610m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 27.vii.1991. - 1 female (PEB-920), 430m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 20.viii.1991. - 1 male (PEB-924), 580m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 21.viii.1991. - 1 male (PEB-926), 670m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 21.viii.1991. - 1 male, 1 female (not collected), 430-790m, Mt. Serapi, Sarawak, vii-viii.1991. - 2 males (PEB-1591, PEB-1592), Mt. Serapi, Sarawak, coll. P.E. Bragg, 4.viii.1992. - 1 female (PEB-1577), 760m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 14.viii.1992.

**Remarks.**- The Phasmida collection in the Budapest Museum was destroyed by fire in 1956 (Dr. Sziraki, pers. comm.) so it must be assumed that all type specimens of Phasmida which were in the museum are now lost. This includes all the type(s) of *O. tessellata* and the paralectotype(s) of *O. atrosignata*. However it is clear from Redtenbacher's description of *O.*



*tessalata* that this is the same as Kirby's *O. pulcherrima*. *O. pulcherrima* is another species which Redtenbacher omitted from his monograph. Although I have no direct evidence (such as observing mating), it seems clear that Redtenbacher's supposition was correct; *O. atosignata* is the male of this species. I have found fourteen specimens of *Orthonecrosia* on Mt Serapi; with the exception of two female and one male *O. oreibates* Günther, 1932, they have all been *O. pulcherrima* or *O. atosignata*. As both the male and female of *O. oreibates* were described by Günther (1932: 71), it is very likely that the others are one species.

It is interesting to note that of the eleven specimens of this species which I have found, all but two had one or more legs missing. One of the specimens with six legs has clearly regenerated the left hind leg. The female which was not collected was found on the road which leads to the top of Mt Serapi; she was being eaten by a large number of small ants.

**Description of the egg** (Fig. 7).- Capsule cylindrical, four times as long as wide; pointed at the polar end. Capsule pale fawn with evenly, finely sculptured surface; height 1.8-1.9mm, length 7.8-8.0mm, width 1.8-1.9mm. Micropylar plate pear shaped, pale cream, not raised, sculptured as the rest of the capsule. Micropyle small and distinct, near polar end of micropylar plate. Raised median line running from the micropyle to polar end, becoming larger towards the polar end. Operculum almost oval but narrower at the dorsal end; recessed, particularly at the ventral side; opercular angle  $+45^{\circ}$ .

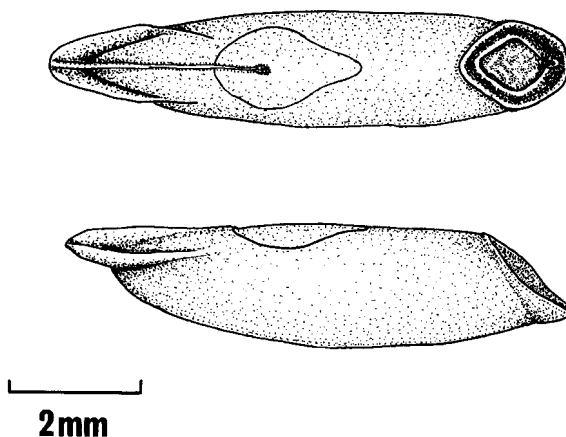


Fig. 7. Egg of *Orthonecrosia pulcherrima*, dorsal and lateral views.

Of six eggs which were incubated, five hatched after 27 weeks. The eggs were kept humid (70-90%) with some background heating, about  $10^{\circ}\text{C}$  above ambient UK temperatures (September - February). The nymphs failed to eat any of the offered food and died in 7-9 days. Measurements of a newly hatched nymph are shown in table 2.

Table 2. Measurements of first instar nymph of *Orthonecrosia pulcherrima* (to nearest 0.5mm).

Head	1.5	<u>Leg measurements:</u>	femora	tibiae
Thorax	7	Fore	8	8.5
Abdomen	13.5	Mid	6.5	7
Antennae	23	Hind	8.5	10

## Bragg : Phasmids from Borneo

### *Centema hadrillus* Westwood, 1859

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

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

*Centema hadrillus* - Redtenbacher, 1908: 490.

*Centema hadrillus* - Günther, 1935: 11.

*Centema hadrillus* - Günther, 1943: 155.

*Centema longipennis* Günther, 1944: 78. New synonym.

**Material examined.**- Holotype (*Centema longipennis*) - male (NHM, B.M.1933-254), beating undergrowth, primary forest, River Kapah, tributary of River Tinjar. coll. Oxford University Expedition, B.M. Hobbey and A.W. Moore, 24.ix.1932.

Lectotype (*Lopaphus hadrillus*) - female (here designated), (OXUM), Sarawak, Borneo.

Paralectotypes - 1 female nymph, 2 males nymphs (OXUM), Sarawak, Borneo.

Others - 1 female, 1 male (SM) no data. -1 female (SM), Sadong, Sarawak, coll. I. H. Cranston. - 1 male (NHM, B.M.1982-387), Batu Niah, Sarawak, coll. A. Harman, xi-xii.1980. - 4 males (NHM, B.M.1982-387) Batu Niah, Sarawak, A. Harman, xii.1980. - 1 male (PEB-1047), on tree, 3m above ground, Pelagus Logging Camp, 50km upstream of Kapit, Sarawak, coll. P.E. Bragg, 8.viii.1990. - 1 female (PEB-930), ground level, in swamp forest, Simunjan, Sarawak, coll. I. Abercrombie, 16.viii.1991. - 2 females (PEB-1624, PEB-1638), on undergrowth, Niah National Park, Sarawak. - 2 males (PEB-1771, PEB-1772), 1st generation captive reared from PEB-930 by I. Abercrombie, 1992. - 1 female, 1 male (living specimens), 1st generation captive reared by M. Herbert, parents from Brunei, coll. M. Herbert, viii.1991.

**Remarks.**- In August 1991 my companion, Mr Ian Abercrombie, found a single female of this species in an area of swamp forest near Simunjan, Sarawak. The live specimen was taken to the UK and kept in captivity for several weeks. Mr Abercrombie incubated the eggs and raised two males and a number of females to adults. I have examined both the original female, a living pair of its progeny and two preserved males. I have also briefly examined a male and female reared by Mr Mel Herbert who collected a female in Brunei during 1991, these specimens confirm the synonym; *C. longipennis* is the male of *C. hadrillus*.

## SUBFAMILY ASCHIPASMATINAE BRUNNER VON WATTENWYL, 1893

### *Presbistus ridleyi* Kirby, 1904

*Presbistus ridleyi* Kirby, 1904b: 419. [nomen novum for *Phasma* (*Ascephasma*) *peleus*, de Haan, 1842: 115.]

**Material examined.** - 1 female (NHM, B.M.87-14), Sarawak. coll. B. Low, [no date given, NHM acquired specimen in 1887]. - 1 male (NHM, B.M.95-178), Sandakan, Sabah, coll. D. Cator, [no date given, NHM acquired specimen in 1895].

**Remarks** - Kirby's name for this species appears to have gone unnoticed by Redtenbacher in his monograph (1906, 1908), as does much of Kirby's work. Although I have been unable to examine de Haan's specimen, I have examined several specimens in the NHM which bear

the name "*Presbistus ridleyi* Kirby"; I assume that one or more of these are the specimens which led Kirby to conclude that de Haan's specimen was not *P. peleus* Gray. Of these specimens, two carry data labels indicating Bornean origin, a male from Sabah and a female from Sarawak.

***Presbistus pilosipes* (de Haan, 1842)**  
(Fig. 8)

*Phasma* (*Ascepasma*) *pilosipes* de Haan, 1842: 115, (2 syntypes, both male, Borneo, Pontianak. (Leiden Museum)).

*Aschipasma pilosipes* - Westwood, 1859: 95.

*Presbistus pilosipes* - Kirby, 1904b: 419.

*Presbistus pilosipes* - Redtenbacher, 1906: 82.

*Ascepasma infumatum* Charpentier, 1845: pl. 41 [female, not male, synonymised by Redtenbacher 1906: 82.]. *Aschipasma infumatum* - Westwood, 1859: 98.

*Presbistus infumatus* - Kirby, 1904b: 419.

*Asceles horni* Redtenbacher, 1908: 496. New synonym.

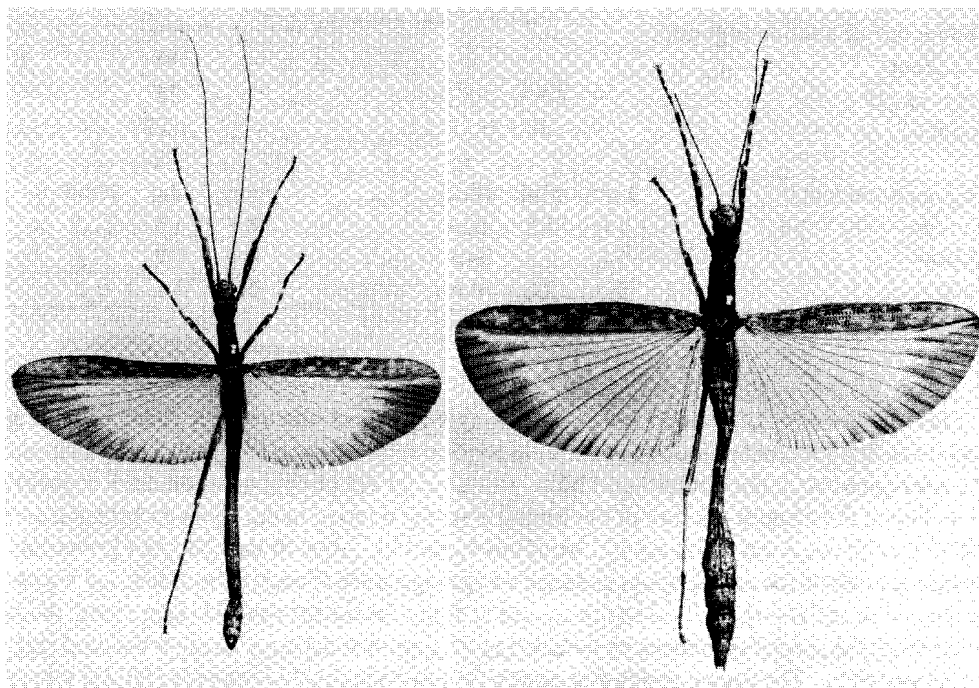


Fig. 8. *Presbistus pilosipes*. Left, male (length = 43mm); right, female (length = 56mm).

**Material examined.**- Holotype (*Asceles horni*) male (NHMW 25.859), Malakka.

Others - 1 male, 1 female (PEB-56, PEB-57) mating pair, on tree 3m above ground, 100m, Mt. Santubong, Sarawak, coll. P.E. Bragg, 18.viii.1989. - 1 male, 1 female (PEB-59, PEB-62) low vegetation, 60m, Kuala Belalong, Temburong District, Brunei, coll. P.E. Bragg, 2.viii.1991. - 3 males, 1 female (PEB-60, PEB-61, PEB-1001, PEB-63) low vegetation, 60m, Kuala Belalong, Temburong District, Brunei, coll. P.E. Bragg, 8.viii.1991. - 1 female (PEB-1000), low vegetation, 60m, Kuala Belalong, Temburong District, Brunei, coll. P.E. Bragg, 12.viii.1991. - 3 males (PEB-1561, PEB-1562, PEB-1563), near Wind Cave, Bau, Sarawak, coll. P.E. Bragg, 8.viii.1992.

**Remarks.**- A mating pair of this species were found at night on the lower slopes of Mt Santubong, Sarawak in August 1989; measurements of these specimens are given in table 3. Specimens collected at Kuala Belalong were all on low growing bushes and had apparently been attracted by the lights of the study centre.

Table 3. Measurements of *Presbistus pilosipes* from Mt Santubong (to nearest 0.1mm). Antennae of female are broken.

Length (mm)	Male			Female		
Head	2.9			3.4		
Pronotum	2.6			3.4		
Mesonotum	4.9			6.2		
Metanotum & median segment	6.7			8.9		
Abdomen	27			34		
Total length	43.5			56		
Antennae	32			>23		
Leg measurements	Fore	Mid	Hind	Fore	Mid	Hind
Femora	7.6	5.5	10.9	8.7	6.3	12.5
Tibiae	5.8	5.3	9.6	6.6	5.9	11.6
Tarsi	5.7	3.6	6.4	6.4	4.1	7.2

There is no doubt that *Asceles horni* was wrongly placed in *Asceles* by Redtenbacher, it is surprising that Redtenbacher made this error as he also produced the monograph which included the Aschiphasminae (Redtenbacher, 1906). However he did place a question mark immediately before the name at the start of the description, and referred to the elytra as withered and stated that he could not really tell if it belonged to *Asceles*. Most of the abdomen is missing, however, based on the thorax, wings and legs, the type specimen appears to be a male, not female as Redtenbacher stated. The coloration agrees with my specimens from Mt Santubong; these differ from the Brunei specimens by having a much narrower darkened area on the hind margin of the wings. The Brunei specimens agree with specimens of *P. pilosipes* at NHMW which were identified by Redtenbacher; I have not examined the type specimen of this species.

***Presbistus eryx* Westwood, 1859**

*Aschipasma eryx* Westwood, 1859: 97, pl. XIX, fig. 3 & 3a.

*Presbistus eryx* - Kirby, 1904b: 419.

*Ascepasma eryx* - Redtenbacher 1906: 77.

**Material examined.**- Holotype - male (OXUM), Malacca.

Other - 1 male, (P.E. Bragg, PEB-58), 640m, Mt. Serapi, Sarawak, coll. P.E. Bragg, 21.viii.1991.

**Remarks.**- There appear to be no published records of this species, other than the holotype; this is the first record from Borneo. The female of this species is unknown.

This specimen agrees in every respect, other than colour, with the holotype. Westwood described the holotype as greenish brown, since then it has become dark brown although some hint of the original green can be seen. My specimen is green, with brown wings and reddish-brown eyes; this was probably the original colour of the holotype. When describing the legs Westwood states "... anterior femora nearly straight", however they are obviously curved at the base, placing this species in *Presbistus*.

***Abrosoma modestum* Redtenbacher, 1906**

*Abrosoma modestum* Redtenbacher, 1906: 85, (Syntypes males females, Mandura (coll. Bolivar), Trichinopoli (coll. Pantel), Sumatra (Genua Museum, coll. Rolle)).

**Material examined.**- 1 female (NHM, B.M.1982-387), 1580m, Mt. Kinabalu Park, Sabah, coll. A. Harman, 10-19.i.1981. - 1 female (PEB-1058), 1580m, near Park Head Quarters, Mt. Kinabalu Park, coll. P.E. Bragg, 30.vii.1990.

**Remarks.**- The only species of this genus which has previously been recorded from Borneo is *A. discolor* Redtenbacher, 1906. These two specimens, lacking wings, are clearly different. This species was identified using the key to this genus provided by Redtenbacher (1906: 83); I have not examined any of the type specimens of either species.

My own specimen, which was green when live, is a straw-yellow with a few hints of green, particularly on the tarsi. The specimen collected by Mr Harman is grey-brown in colour. Both specimens are smaller than the description of the syntypes. Redtenbacher does not state the number of type specimens, a range of size is given for the male, only one set of measurements are given for the female.

**SUBFAMILY: HETEROPTERYGINAE REHN, 1904**

***Planispectrum* Rehn & Rehn, 1938.**

*Planispectrum*, Rehn & Rehn, 1938: 484. [Type species *Platymorpha cochinchinensis* Redtenbacher, 1906: 46, pl. I fig 11. Syntypes male and female, *Cochinchina* (Paris Museum)]. (= *Platymorpha* Redtenbacher, 1906; and *Platyphasma* Uvarov, 1940)

**Remarks.-** This genus, originally named *Platymorpha* by Redtenbacher was renamed by Rehn & Rehn as the name was preoccupied by *Platymorpha* Jacoby, 1888 (Coleoptera). Uvarov (1940) proposed *Platyphasma* to replace *Platymorpha* apparently unaware that Rehn & Rehn had already renamed the genus. As *Planispectrum* is a valid name, *Platyphasma* is rejected as a junior homonym.

This genus has not previously been recorded from Borneo; the only records for the genus are the type specimens of the two described species.

***Planispectrum bengalensis* (Redtenbacher, 1906)**

(Fig. 9)

*Platymorpha bengalensis* Redtenbacher, 1906: 46, (Lectotype female (NHMW), paralectotypes females Bengalen (Paris Museum), and Java (Paris Museum)).

**Material examined.** - Lectotype - female (here designated) (NHMW), Bengalen.

Others - 1 female (OXUM), Matang, Sarawak, Aug. 1899. - 1 female (SM), Santubong, Sarawak, ii.1900. - 1 female (C.L. Chan), 16 miles N.W. of Keningau, 1400m. Crocker Range NP, Sabah, coll. S. Nagai, 24.i.1983. - 1 female (NHM 94-231), Singapore. [no date given, specimen acquired by NHM in 1894].

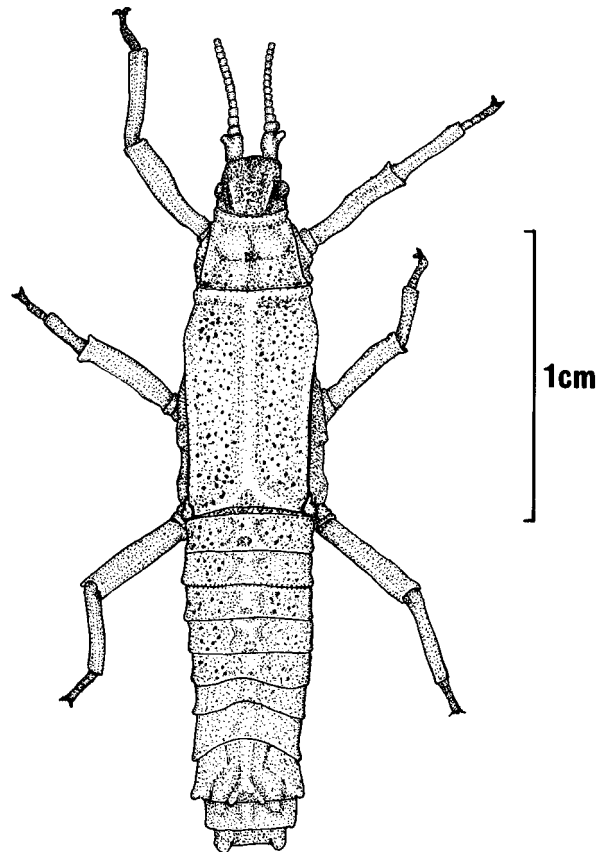


Fig. 9. Female of *Planispectrum bengalensis*.

**Remarks.-** In the absence of a holotype, I select the single female specimen in NHMW as the lectotype. This specimen had five labels to which I have added a red lectotype label. The uppermost label is printed and reads "Museum Paris, Bengkalis, Maindron 1885". The lectotype is the only specimen of this species in NHMW. The number of paralectotypes is unknown, a request to Paris Museum for information has received no reply.

The Matang specimen agrees in all details with the lectotype, except for a slightly shorter body, 23.5mm as opposed to 25.5mm, the width of both specimens is 4.5mm at the widest point. Both the lectotype and Matang specimen have 14 antennal segments, a distinctive feature according to Redtenbacher's description. The Santubong and Crocker Range specimens were only briefly examined and the antennal segments were not counted, however they appear to be the same species. The NHM specimen is included here as the first record of this species from Singapore. The male of this species is unknown.

## DISCUSSION

The Phasmida of Borneo, and indeed most of the world, have been little studied. There is no doubt that there are many species of phasmids which remain unrecorded from Borneo and there are certainly new species yet to be discovered. The number of *A. conicipennis* which were collected indicates that this species is common, at least on Mt. Serapi. Trials with different foodplants in the U.K. combined with the fact that this species was only found on one type of bush in Sarawak, is evidence that many of the smaller winged phasmids are specialised feeders.

Four of the species mentioned above were omitted from Redtenbacher's monograph. There are a number of omissions in this publication, particularly where Kirby's work is concerned.

## SUMMARY

Five species of Phasmida which have previously only been recorded from West Malaysia, Java or Sumatra have now been found in Borneo. One species appears to be at least locally common and yet has only been recorded once from Borneo, this underlines the paucity of information on Bornean Phasmids. *Asceles acutegibbosus* Redtenbacher, 1908, and *Calvisia maculata* Kirby, 1904, are junior synonyms of *Asceles conicipennis* (Bates, 1865). *Sosibia peninsularis* Kirby, 1904, does occur in Borneo but it is not a synonym of *S. curtipes* (Westwood, 1848); the published record of the latter species in Borneo is incorrect. The genus *Planispectrum* does occur in Borneo. *Presbistus horni* (Redtenbacher, 1908) was placed in the wrong subfamily when it was first described, and is a junior synonym of *Presbistus pilosipes* (de Haan, 1842). *Centema longipennis* Günther, 1944, is a junior synonym of *C. hadrillus* (Westwood, 1859). *Orthonecroscia atosignata* (Redtenbacher, 1908) and *O. tessellata* (Redtenbacher, 1908) are both junior synonyms of *O. pulcherrima* Kirby, 1904.

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LITERATURE CITED

- Bates, H.W., 1865. Descriptions of fifty-two new species of Phasmidae from the collection of Mr. W. Saunders, with remarks on the family. *Trans. Linn. Soc. Lond.*, **25**: 321-359, pls. 44-46.
- Charpentier, T., 1845. *Orthoptera descripta et depicta*. Lipsiae.
- Clark, J.T., 1976. The eggs of stick insects (Phasmida): A review with descriptions of the eggs of eleven species. *Syst. Ent.*, **1**: 95-105.
- Günther, K., 1932. Die von Professor Dr. H. Winkler 1924/25 in Zentralborneo gesammelten Phasmoiden. *Zool. Anz.*, **101**(3/4): 65-73.
- Günther, K., 1935. Phasmoiden aus Centralborneo Gesammelt von Dr. Mjöberg 1925-26. *Ark. Zool.*, **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. *Stett. Ent. Zeit.*, **105**: 68-79.
- Haan, W. de, 1842. *Bijddragen tot de Kennis Orthoptera*. in Temminck, C.J., *Verh. nat. Ges. Nederl. overz. Bezt.*, **2**: 95-138.
- Kirby, W.F., 1904a. Notes on Phasmidae in the collection of the British Museum (Natural History), South Kensington, with descriptions of new genera and species. - No. 2. *Ann. Mag. Nat. Hist.*, (7)**13**: 429-449.
- Kirby, W.F., 1904b. *A Synonymic Catalogue of Orthoptera*, **1**. London.
- Redtenbacher, J., 1906. *Die Insektenfamilie der Phasmiden*, **1**. Leipzig.
- Redtenbacher, J., 1908. *Die Insektenfamilie der Phasmiden*, **3**. Leipzig.
- Rehn, J.A.G. & Rehn, J.W.H., 1938. The Orthoptera of the Philippine Islands, Part I. -Phasmatidae; Oribminae. *Proc. Acad. Nat. Sci. Philadelphia*, **90**: 389-487.
- Uvarov, B.P., 1940. Twenty-four new Generic names in Orthoptera. *Ann. Mag. Nat. Hist.*, (11)**6**: 112-117.
- Westwood, J.O., 1848. *The Cabinet of Oriental Entomology*. London.
- Westwood, J.O., 1859. *Catalogue of the Orthopterous Insects in the Collection of British Museum*. Part I: Phasmidae. British Museum, London.