

## The longest stick insect in the world, *Pharnacia kirbyi* (Brunner)

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### Introduction

For 95 years *Pharnacia serratipes* (Gray) has been regarded as the longest insect in the world. This record is based on a female specimen in the NHM which was tentatively identified as *Pharnacia serratipes* by Kirby in 1896. Kirby mentioned this as ‘‘the largest species known’’, based on a specimen ‘‘from Borneo’’ which was ‘‘nearly 13 inches’’ (Kirby, 1896: 448). Kirby subsequently (Kirby, 1904: 359) decided the specimen was *P. maxima* (Bates), this change was ignored by Redtenbacher (1908) who listed Kirby’s Bornean specimen under *P. serratipes*. The re-identification also appears to have gone unnoticed by the compilers of the *Guinness Book of Records* who listed it as *P. serratipes* under the heading of ‘‘the longest insect in the world’’ (e.g. Wood, 1976: 181, and McFarlan, 1991: 44). *The Guinness Book of Records 1993* (Matthews, 1992: 38) lists *Palophus leopoldi*, an African species, as the world’s longest insect, length 400mm. However enquiries have revealed that this refers to overall length, including the legs; the length previously quoted for Kirby’s specimen was just the body length, the overall length is 499mm, so it is still the longest species. I understand from Guinness Publishing that this will be corrected at the next opportunity.

### Identification

While checking the *Pharnacia* which have been recorded from Borneo I decided to examine this specimen. Initial attempts to locate the specimen in the NHM collection were unsuccessful. Eventually the specimen was located in a storeroom where it had been kept after a public display had been dismantled some time ago. The specimen was found to be neither of the two species suggested by Kirby, it was found to be a species which was described by Redtenbacher in 1908. Redtenbacher described the females as *P. sagitta* and the males as *P. pilicornis*; these were synonymised by Günther in 1932 with *P. sagitta* as the senior name.

However further checking in the literature revealed that Brunner von Wattenwyl (hereafter referred to as Brunner) had used Kirby’s specimen to establish a new species, *Phobaeticus kirbyi* (Brunner, 1907: 185). Although Kirby referred to two specimens (1896: 448) he stated that he was not certain that they were the same

species. Brunner only gives measurements for the largest specimen, no reference is made to any other specimen, so the large specimen must be considered the holotype, and only type, of this species. The NHM was unaware that the specimen had become a type specimen which is why it was allowed to go on public display and was subsequently mislaid.

Brunner described *Phobaeticus* in his tribe Clitumnini and stated that both the males and females of this group are wingless. Brunner had certainly not examined Kirby's specimen, otherwise it would have remained in *Pharnacia*, in Redtenbacher's tribe Acrophillini. The male of this species is winged. However despite these errors, Brunner's specific name is the oldest available name for this species. The correct combination is *Pharnacia kirbyi* (Brunner).

### **Pharnacia kirbyi (Brunner 1907)**

*Pharnacia serratipes* (Gray), Kirby, 1896: 448 & 450 [misidentification].

*Pharnacia serratipes* [Kirby's specimen only], Redtenbacher, 1908: 455.

*Pharnacia maxima* (Bates), Kirby, 1904: 359 [misidentification].

*Phobaeticus kirbyi* Brunner, 1907: 185. Holotype ♀, Borneo, (NHM).

*Pharnacia sagitta* Redtenbacher 1908: 454, plate XXII fig. 2, Holotype ♀, Borneo (NHMW). **New Synonym.**

*Pharnacia sagitta* Redtenbacher, Günther, 1932: 315.

*Pharnacia sagitta* Redtenbacher, Günther, 1943: 155.

*Pharnacia pilicornis* Redtenbacher, 1908: 455, Syntypes ♂♂, Borneo, Brunei. Kina Balu. (NHMW) [Synonymised by Günther, 1932: 315]

### **Distribution**

All published records of *P. serratipes* in Borneo relate to Kirby's misidentified specimen. However Redtenbacher (1908: 454) recorded *P. acanthopus* (Burmeister) from Borneo and, as this is a junior synonym of *P. serratipes*, the latter species should still be listed as a Bornean species. The maximum recorded length of this species is 243mm.

As with most Bornean Phasmida, few specific localities have been recorded for *P. kirbyi* and its synonyms. Existing records of this species usually refer rather vaguely to "Borneo" and "Brunei" while more specific records are from Kinabalu in what is now Sabah (Redtenbacher, 1908, Günther, 1932), and Long Bloe Oe and Halekpapan in Kalimantan (Günther, 1932), and Long Bloe Oe and Halekpapan in Kalimantan (Günther, 1943). I have collected this species from three localities: Niah National Park in eastern Sarawak, 20km sw of Tatau in central Sarawak, and Kuala Belalong in the Temburong District of Brunei. At Niah this species is exceptionally common along the path leading from the Park Head Quarters to the Great Cave; approximately 40 adult specimens were seen in one night during August 1992. Several mating pairs were encountered, confirming Günther's synonymy (*P. sagitta* = *P. pilicornis*). I estimate that 60-80% of the female specimens had one

or more legs missing, a large proportion of males also had legs missing. One female specimen had only three legs and one of the specimens collected had clearly lost and regenerated both front legs. The Sarawak Museum contains old specimens (1899-1911) from Kuching in western Sarawak, and Baram in N.E. Sarawak.

**Size variation**

This species shows considerable variation in body length (Table 1). The length recorded by Kirby was ‘‘1 foot 10 lines’’ (1896: 450), this converts to 328mm although Brunner gave 330mm, perhaps converting Kirby’s ‘‘nearly 13 inches’’ (1896: 448); the longer length has been quoted by all subsequent authors. The lengths of specimens from Niah are taken from four males and four females in my own collection. The specimen from Kuala Belalong is the second longest phasmid to be recorded from Borneo based on body length; if legs are included then it is the longest, with an overall length of 546mm.

Location	Author	Females	Males
Borneo	Kirby (1896)	328	–
Borneo & Kinabalu	Redtenbacher (1908)	195	134-137
Kuala Belalong	Bragg (new data)	283	–
Niah National Park	Bragg (new data)	247-269	139-154
20 km sw of Tatau	Bragg (new data)	–	147

**Table 1.** Body lengths of *Pharnacia kirbyi* in millimetres.

As Kirby noted (1896: 450) the length of the legs may be different on opposite sides of the body. This is not particularly unusual in phasmids, even if legs have not been regenerated. The variation in leg length is particularly noticeable in this species because of the exceptional length.

**The egg (Fig.1)**

Capsule basically a laterally compressed sphere; slightly longer than high, truncated at the opercular end. A keel runs round the dorsal and ventral surfaces of the capsule, beginning and ending at the operculum with short breaks at the polar end and at the micropylar plate. Capsule and operculum smooth, mid brown in colour. Keel with slightly raised radial ridges, mid brown except for some black spots where it joins the main capsule. Micropylar plate bilobed, consisting of one almost circular lobe on each side of the dorsal line; the edge of the plate is not raised but is marked by a reddish brown line; micropyle at the polar end of the plate. Operculum slightly convex with a central black capitulum.

A sample of 28 eggs laid by four specimens collected at Niah were found to have the following size ranges: Capsule length 5.26-5.84mm, Height 4.68-5.06mm, Width 3.12-3.31mm, Capitulum length (of dehydrated eggs) 0.71-0.84mm.

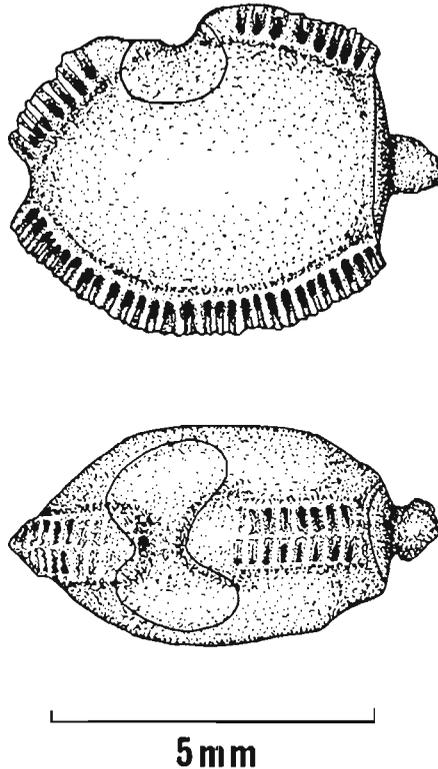


Fig. 1. The egg of *Pharnacia kirbyi*, lateral & dorsal views.

### Rearing in captivity

Eggs from specimens collected at Niah began to hatch after incubating for six and a half months at ambient UK temperatures.

The newly hatched nymphs had bodies of 32mm, fore leg 45mm, mid leg 29mm and hind leg 37mm. Although the nymphs fed on bramble (*Rubus* sp.) and some specimens continued to feed in the second instar, none reached the third instar and a culture was not established.

## Summary

The longest insect in the world was originally recorded from Borneo under the name *P. serratipes* (Gray), subsequent corrections to the name were overlooked and this name continued to be used for 95 years. The specimen is in fact the holotype of *Pharnacia kirbyi* (Brunner). *Pharnacia kirbyi* is the senior synonym of both *P. sagitta* Redtenbacher and *P. pilicornis* Redtenbacher. The egg is described and illustrated for the first time.

## Acknowledgements

My specimen from Brunei was collected in August 1991 as part of the Royal Geographical Society/Universiti Brunei Darussalam Rainforest Expedition and is now deposited in Brunei Museum. I thank Mrs J Marshall of the NHM for her efforts to locate the type specimen of *P. kirbyi*.

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