

## Species report on *Pharnacia biceps* Redtenbacher, PSG 203

Wim Potvin, Brusselbaan 7, 1600 Sint-Pieters-Leeuw, Belgium.

### Abstract

Brief descriptions of the adults, eggs and nymphs of *Pharnacia biceps* Redtenbacher (PSG 203) are given. Housing, feeding and breeding of this large species are discussed. This article previously appeared in *Phasma*, (9)36: 101-104, November 1999 (in Dutch).

### Key words

Phasmida, *Pharnacia biceps*, rearing, Java.

### Culture origin

Some years ago Johan van Gorkom found this species in the mountain forests of Eastern Java. He managed to breed them in captivity, but he was able to distribute any surplus only after several generations. In December 1997 he gave me a few small nymphs, from which I raised two females and one male to adulthood. I have since bred three further generations and have given away eggs, nymphs and adults to about a dozen other breeders. Recently, this species has been added to the Phasmid Study Group's culture list as PSG 203.

### Taxonomy

*Pharnacia biceps*, belonging to the subfamily *Phasmatinae*, was first described in 1908 by professor J. Redtenbacher in the book "Die Insektenfamilie der Phasmiden" which he wrote together with K. Brunner von Wattenwyl. This species is similar to *Pharnacia westwoodii* (Wood-Mason), PSG 197, but differs by much less developed lobes on the seventh abdominal segment. The eggs are also clearly different.

### Adults (Figures 1 & 2)

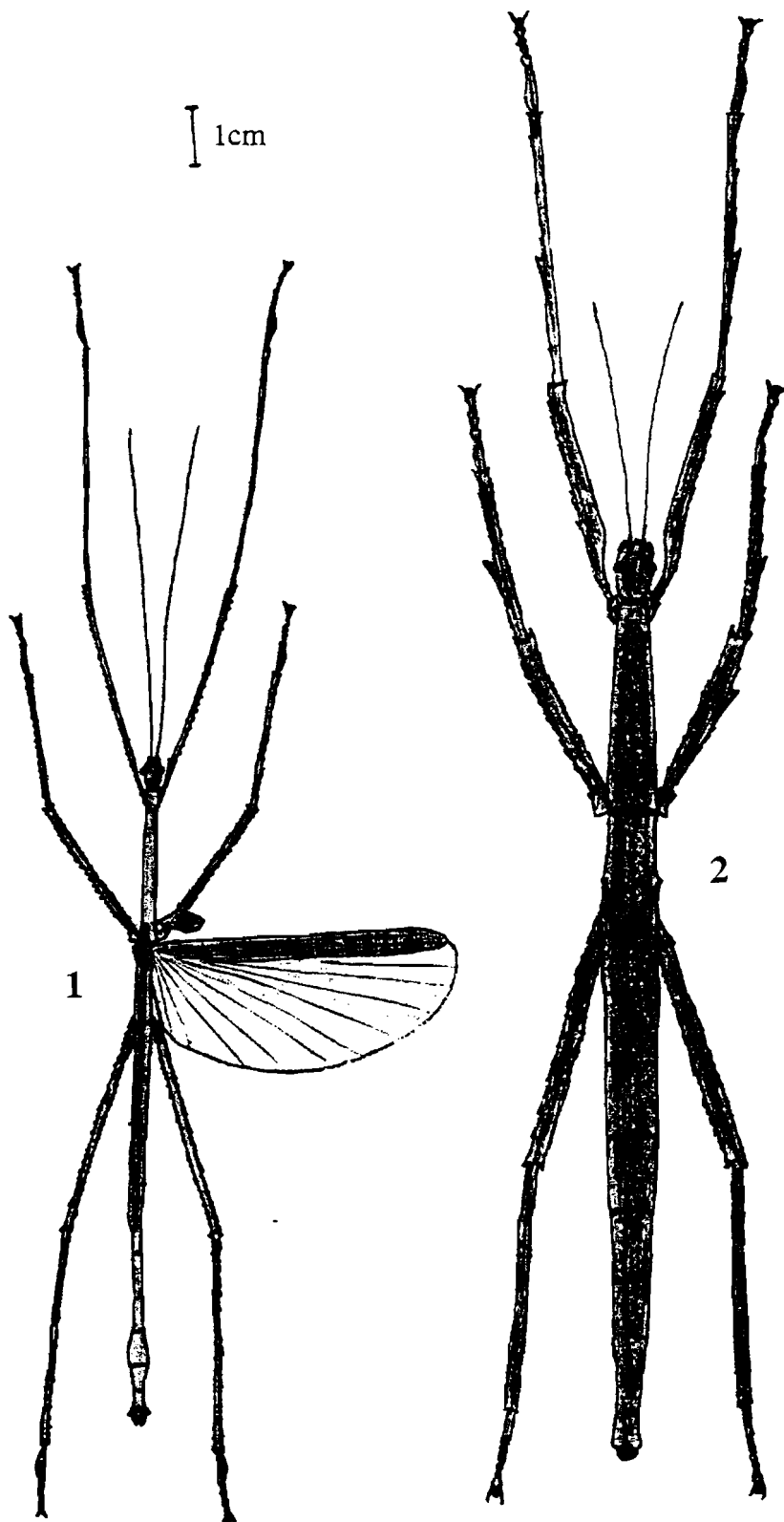
The female is brown, sometimes with a greenish sheen, and her body measures 160-180mm. The head is ovoid, with two small tubercles on the top. The antennae reach about 15mm beyond the joint between the front femur and tibia. All legs carry plenty of small teeth which always point towards the tarsi. Usually, the front and middle tibia have a bigger tooth at about one third from the knee joint, sometimes split into two points. In some females these are not present, or sometimes on only two or three legs. Sometimes the middle femur also has a similarly enlarged tooth. On the first tarsal segment of the front legs there is a very small lobe.

The tenth abdominal segment is slightly split into two lobes at the end. The subgenital plate has a rounded end and reaches a few millimetres further than this last segment. The cerci are very small. The abdomens of fat females can be up to 12mm wide.

The metanotum of the female has two small bumps at the place where winged species carry their hind wings. As the males of *P. biceps* are winged, these bumps may logically be the remains of wings that are degenerated during evolution. These small protuberances are also seen in other species of the genus *Pharnacia*.

The male has a body length of 105-120mm and is a lot slenderer than the female. He is brownish green in colour and has fairly large wings. With these wings he can flit about like a plump butterfly, although he rarely does so. The hind wings are green at the costal margin, the rest of the costal region is brown. The membranous part of the wing is light grey with tiny dark veins. The small front wings or elytra are brown and have a green stripe on the outer side.

The male's head is the same shape of the female's, but is a little slenderer. His antennae reach further than the middle of the front tibia. The legs are dark brown, they are also richly provided with very small teeth. When touched, the legs feel very rough: pay



*Pharnacia biceps*, 1. Male. 2. Female.

attention to this when handling an adult male, as the legs might stick onto your fingers and the insect can feel threatened enough to throw off a leg (autotomy).

The subgenital plate of the male is very thickened. The last abdominal segment is split into two parts up to about halfway. His cerci measure about 3mm and are slightly curved.

Dead specimens of *P. biceps* in a museum are usually a few centimetres longer than those we breed in captivity. These specimens are wild caught. Most species become smaller in captivity and their defensive behaviour becomes less obvious. The food also has an influence to the length of these insects (see feeding, below).

Adult females live for about half a year. The males regularly copulate and often a spermatophore can be clearly seen during or shortly after mating. This round spermatophore measures about 3mm. Due to their active life, the males usually die after only three or four months. Males that are isolated in a separate cage, easily live for a month longer. The females lay a nice number of eggs, 2 to 3 every day. Egg laying only starts three weeks after the female's final skin shedding. They catapult the eggs with a short but powerful swing with their abdomen. In an open environment the eggs would get at least 4 metres away from the female. A terrarium is a lot smaller than that so you regularly hear the eggs bouncing against the sides of the cage.

### Eggs (Figure 3)

The eggs of *P. biceps* are smooth and oval shaped. They are about 4mm long, 3mm wide and 3.5mm high. The operculum carries a pistil-shaped capitulum consisting of a softer organic matter. The egg capsule itself is very hard, shiny, and dark grey in colour. Around the light grey micropylar plate there is a black border and around that another light grey border, forming a nice and clearly visible edge.

The eggs are best incubated on a layer of slightly humid substrate. I personally prefer using soil which I firmly push to a hard layer of about an inch thick into a plastic incubating box. At a normal room temperature the nymphs will start hatching after about four months. If the average temperature is higher than 25°C (77°F), the first nymphs can hatch after three months. Temperatures higher than 30°C (86°F) increase the risk to dry out and can cause a too fast embryo development so that the hatching nymphs are fairly weak and sensitive to changes. There will also be more males at a higher temperature.

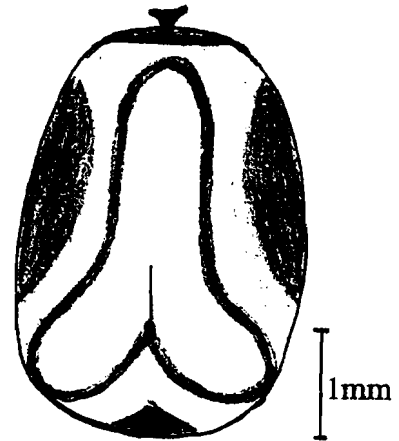


Figure 3. Egg, dorsal view.

### Nymphs

When the nymphs emerge from their egg, they already measure about 25mm. They have long legs, typical for a *Pharnacia* species. The body is light brown to grey, the legs are dark brown and banded with grey. The nymphs need enough space during hatching in order to fully expand their body and legs. When they are disturbed during this by another nymph, or if the incubating box is too small, their body will remain short and wrinkled. If such a nymph can eat without problems, this usually causes no death and after the first skin shedding the body will be normally stretched.

Female nymphs moult seven times, males six times. After the second moult the banded legs mostly become plain brown. They keep this colour until adulthood, but the brown can be light or dark depending on the temperature and relative humidity. Females have a more

developed body and wider legs with small teeth while males are a bit slenderer and their legs are less dentated. One can clearly distinguish them from the third nymphal stadium onwards by the male's developing genital bump under the end of its abdomen. Female nymphs in particular have a small lobe at both sides of the seventh abdominal segment. However, these lobes disappear as they become adult.

### **Defensive behaviour**

The first and most obvious defense is mimicry: this species looks like a twig in shape and colour. The animals usually hang onto leaves and branches at random and move only at night so that they are not seen. However, the females sometimes lay an egg during the day. Then they first gently start wobbling as if a light breeze is blowing. In one fluent movement they flick an egg away and after that they keep on wobbling for a while. To potential enemies it looks as if there was just a gentle wind blowing through the trees.

When handling large nymphs or adults, they can squeeze their middle legs together. This really scares you as at that moment the tables seem to be turned: who is holding who? It sometimes happens that they drop a leg (autotomy) to confuse the enemy even more. Meanwhile the stick insect can drop itself to the ground or run away. Regenerated legs are virtually as long as normal legs after several skin sheddings, but they are never as thick and dentated.

In order to escape from the disturber, this species sometimes lets itself fall. The intention is to disappear into the dense ground vegetation of the forest. One day I wanted to take an adult female out of the cage. That cage is about 2 metres above the floor and I always need a chair to reach it. But that day I did not grip it well enough and she dropped to the ground, about 2.5 metres deep. She fell flat onto the floor and the smack made her abdomen burst at the right hand side. The tear was not a protruding wound, however, a few droplets of fluid came out. I carefully put her back into the cage. The sticky fluid dried out and that way the wound was actually closed after a couple of hours. She lived for about as long as the other females and laid a normal quantity of eggs. After a few days the wound was hard to see, but I believe she was very lucky to survive that accident.

Like many (if not all) phasmids this species can vomit some fluid. This liquid is the sticky stomach contents, which have a bad taste and smell. During vomiting they bend their head forward, meaning to dirty the enemy. If a predatory bird cleans its feathers after dinner, it will certainly remember what it has eaten.

Finally, adult males can fly away when disturbed. The wings are not strong enough to take it far away, but the insect can however escape in a flitting glide. Nymphs and adult females sometimes run away. This way of escaping is not that effective as it makes them very visible and usually the enemy is faster. However, when they can run away and suddenly go hanging under a large leaf, they might have more luck.

### **Feeding**

We do not know what this species eats in nature. In captivity it likes bramble and I noticed that they really adore oak. In most European countries this is not available during winter, so always add bramble so that you can easily switch back onto bramble in winter. The adults that are raised on a mixture of bramble and oak appear to be larger and stronger than specimens that are raised on bramble only!

Other plants that are accepted as food are rose, hornbeam and hazel. There certainly are more, but I have only tried a few plants so far. They do not eat ivy.

If you get the choice, feed hard and strong leaves. They prefer this rather than soft, young and bright green leaves, which mostly contain too much water. From the latter they

can get diarrhoea and become ill. When you cannot find any dark, strong leaves (e.g. in April or May), you must seriously decrease spraying.

### Care, housing and breeding

This fairly big species logically needs a spacious cage. Adults or large nymphs are best housed in a cage with a height of at least 750mm. Make sure the cage is well ventilated, for example with one whole side of netting. However, nymphs in the first and second instar can have a less ventilated cage because they like some more ambient humidity.

At my place this species is housed in a full glass terrarium with a wide strip of netting at the front near the bottom of the cage and the whole upper side is netting. On top of the cage I installed a tube lamp of 15W which works from 0900 to 2100. Every evening I spray with clean rain water in the cage (not too much!). This way the relative humidity inside the cage is higher at night (c. 80%). When the tube lamp is switched on the next morning, it gets a little warmer and the relative humidity decreases to about 60%. Animals that are constantly kept in humid conditions become very weak and often die before reaching adulthood.

The temperature should not be too high. During the day it is a bit warmer due to the rays of the tube lamp on top of the cage, but the temperature usually does not get higher than 25°C. At night the temperature usually decreases to about 20°C. In winter it may sometimes, on the coldest nights, even be as low as 18°C.

When given the right conditions, this species is not difficult to breed.

### Bibliography

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