



A mated pair of *Corynorhynchus sp.* encountered in Caatinga forest near the village of Boa Vista, near Nova Olinda in Brazil.. Note the smaller size of the male and the sexual dimorphism in the size of the head fastigium (markedly longer in female).



## TAMING THE WILD HORSEHEADS

### Introduction

Whilst chatting to Jon (Editor of *Exotic Pets* magazine) at the recent BUGFEST event in Yeovil I was reminded about an offer I had made several months earlier, to contribute to the magazine. Well...the normal excuses about not having the time welled up inside me and I gave some sort of vague commitment. However on reflection several weeks later, I was inspired to make the time to put fingers to keyboard on Jon's suggested subject of "horsehead grasshoppers" fantastic insects which I first kept 10 years ago. This inspiration was further motivated because there is little written information generally on keeping orthopterans (grasshoppers, crickets, mole crickets and bush crickets) and certainly nothing specific on keeping the weird and wonderful group of grasshoppers known as proscopiids.

So here is the article, written with a little help from some good friends.

### General Notes on Proscopiidae

The Proscopiidae are a group of highly cryptic grasshoppers characterized by their

stick-like appearance and stick insect like habits. They belong to the insect order orthoptera, which includes grasshoppers, katydids and crickets. They can easily be mistaken for phasmids (stick insects) at first glance and indeed this mistake was made by researchers for the BBC series "Life in the Undergrowth" where David Attenborough incorrectly presented a proscopiid as a stick insect.

On close inspection the form of the head and mouthparts together with the mid and hind leg arrangement will lead the trained observer to a different conclusion regarding their classification. The family comprises some 215 species in 30 genera distributed throughout Central and South America. Proscopiidae are entirely flightless and primarily wingless, though some genera retain vestigial wing rudiments. Whilst modern day Proscopiids are flightless, fossil records show that ancestors had well developed wings. A fossilized winged proscopiid previously thought to be a stick insect was recently identified and featured in the *Daily Telegraph* newspaper on 24<sup>th</sup> March 2008.

The species named by Sam Heads of the University of Portsmouth as *Eoproscopia martilli* dates back 120 million years to the time of the dinosaurs. The family has also evolved with the loss of the auditory tympanal organ as the insects are effectively deaf, the males





consequently have no song.

Most species show marked sexual dimorphism, with males being much smaller than females, and often more colourful. The Proscopiidae have weird head shapes with onion shaped mouthparts and bulbous eyes mounted high on the apex of the head, topped by tiny stub like antennae. Often the head also bears an elongated process known as the *fastigium*. The shape of the head has led to the common name of "horsehead grasshopper" for certain species. For reasons given above they are also sometimes referred to as "false stick insects", "stick grasshoppers" or "jumping sticks".

**Footnote / reference** Check out the Orthoptera Species File Online (OSF) for more accurate information at the following URL:  
<http://osf2.orthoptera.org/HomePage.aspx>

## Habitat and Ecology

Despite their extreme morphological crypsis, proscopiids are ecological generalists, occupying a number of different habitats and feeding on a variety of host plants. Indeed, a single species may feed on several different plant families and some are considered sporadic pests. It is amazing the diversity of plants that proscopiids will

take... they are true generalist phytophages and a single species will feed on a wide variety of host plants. For example, *Stiphra robusta* in northeast Brazil has been observed feeding on representatives of at least 10 different plant families. Indeed, this behaviour is a problem in the arid areas of northeast Brazil where proscopiids (*Stiphra robusta* in particular) are viewed as serious crop pests.

Whilst a few species of proscopiid inhabit deserts and several others mountainous areas at elevations beyond the tree line, stick grasshoppers are mostly restricted to the forests and nearby scrubland of South America and from the rainforests of Central America north as far as Panama.

Most species live amongst low vegetation at the edge of the rainforest where there is some air movement. Stick grasshoppers cannot fly and whilst they can jump their hind legs are not well adapted to jump great distances.

They perch on vegetation and sway enjoying air currents mimicking a stick blowing in the wind. It is thought that swaying back and forth in this fashion may reduce the chance of being spotted by predators. Nymphs are more likely to propel themselves into the air than adults when disturbed. In the wild the usual defence mechanism is to freeze still and if touched or molested further, they will often throw themselves to

**Female *Stiphra robusta* photographed in a disused limestone quarry near Araporonga, north-west of Santana do Carriri in Brazil.**





the ground where they may be perfectly camouflaged in the jumble of leaf and stick litter on the forest floor. Aggressive behaviour can be experienced with some species when handling Proscopiidae in the wild.

During a recent expedition to Brazil a friend of mine was regularly kicked by a large proscopiid (probably a species of *Corynorhynchus*); the longitudinal rows of spines on the metathoracic tibiae (hind legs) of these species are formidable and can easily draw blood! In the wild stick grasshoppers are best found at night, on the edges of forested areas and in jungle clearings. The normal collecting technique is similar to that for phasmids, which means searching the vegetation with a lamp. The insects are usually found between 0.5 and 3 metres above the ground. Since stick grasshoppers do not possess an auditory tympanal organ, no stridulation call can be observed in males to give a clue as to an individual's whereabouts.

## Stick Grasshoppers in Culture

At least 4 species have been introduced into culture in Europe in recent years and bred successfully. These are outlined below.

1. *Prosarthria teretirostris* originated from Ecuador in the 1990's and was brought into culture by Peter Grabowitz. It is abundant on the edges of forests.

Females of *P. teretirostris* reach 12cm long and the smaller males of these species are the more colourful of the sexes, with yellow, blue and green markings. This species has also been circulated under the name of '*Proscopia luceomaculata*' however there appears to be no reference to this name in the systematic literature and therefore it is suggested that there is no taxonomic justification for naming the species as *P. luceomaculata*. In fact recent close examination of the species currently in culture has revealed that it does not appear to be *Prosarthria teretirostris* after all, but rather a new species of *Prosarthria*!

2. *Pseudoprosopia scabra* is found in French Guiana and was introduced by the ASPER Team (France) in the 1990's. The species reaches about 18cm in length. . In French Guiana this species is frequently found in several localities throughout the country. However they do not appear to be particularly abundant with only single specimens usually found. It is suspected that the cultures of this species in Europe have now died out.

3. *Pseudoprosopia latirostris* was introduced by Oskar Conle & Frank Hennemann in 2004 from Peru, (Rio Lullapichis, Panguana). Females of *P. latirostris* reach 17cm long. This species also appears to be not particularly abundant. Males are apparently more numerous than females. They are best found after rain, when they usually rest on top of large leaves.

**Adult male *Prosarthria teretirostris*. Note distinctive yellow patches on fastigium, mouthparts and thorax.**





**Adult male of *Apioscelis bulbosa* from Peru. Note the enlarged “bulbous” proximal third femur of the hind leg, which gives the insect its specific name.**

4. *Apioscelis bulbosa*, was also introduced by Oskar Conle & Frank Hennemann in 2004 from Peru, (Rio Lullapichis, Panguana). This species is apparently more common and more abundant in its natural habitats. In "Panguana" Conle and Henneman found more than twice as many specimens of this species compared with *P. latirostris*. It appears to be rather common in other localities in Peru as well (e.g. Satipo).

**Footnote / reference** For more information on the ASPER team check out the following URL:

[http://pagesperso-orange.fr/philippe.lelong/menu/en\\_menu.html](http://pagesperso-orange.fr/philippe.lelong/menu/en_menu.html)

## Rearing observations and considerations

These insects appear to enjoy communal living at all stages without any signs of cannibalism. Feeding is straight forward since they will take bramble leaves, rose or oak as a staple diet item at all stages but there are likely to be many other potential food plants. For instance it has been found that *Apioscelis bulbosa* love to feed on *Scindapsus* sp. (Aracea) colloquially known as "Devils Ivy".

A well ventilated cage with at least 60x60x60cm and tropical humidity is recommended to maintain a strong culture. A variety of oak, bramble and rose should be offered, as available. A daytime temperature

of 22°C to 28°C is suitable with a temperature reduction of around 4°C to 8°C at night time. Whilst newly hatched nymphs can be tricky, established nymphs are easy in a tall ventilated cage with humidity. A netted cage with a daily fine mist spraying works well, but I always use tepid rain water (warmed to room temperature). Heavy spraying or using "cold" water is to be avoided as this can cause chilling and death. As far as possible, when spraying it is best to avoid directly wetting the insects.

Nymphs take 4 to 8 months to mature and adults can live over a year. Nymphs can usually be sexed by the 5<sup>th</sup> instar. As with other Orthoptera and phasmids (stick insects) males mature before females reaching adulthood in one less instar. In captivity it is normal to have more males than females and the ratio of males to females may exceed 3:1 in some species such as *P. Latirostris*.

A similar proportion is borne out through observations in the wild. Pregnant females of the larger species like *P. scabra* and *P. latirostris* are clumsy animals and their centre of gravity moves along their abdomen as they increasingly become engorged with the forming of eggs. The effect of this uneven weight distribution is that if they have cause to jump, the act of propulsion can cause the insect to do a backwards somersault as centrifugal forces come into play !

The females lay 4 to 6 batches of eggs during their lifespan each batch containing 12 to 30 eggs. The eggs usually resemble black grains of rice and are laid to a depth





Adult female of *Pseudoprosopia latirostris* a large easy to keep species which is sometimes mistakenly confused with *P. scabra*. Close inspection of the males is the easiest way to distinguish the two species.



equivalent to the length of the abdomen in loose soil. In order to lay the female looks quite comical as she straddles the substrate with hind legs pushed out horizontally at right angles to the body so that they are out of the way and the abdomen can be inserted full length.

Proscopiids will lay in a pot of coarse compost. My personal choice is to mix compost with straw / small chopped up sticks and some leaf litter so as achieve a loose matrix and avoid compaction, thus creating an aerated loose mix resembling forest floor material.

A tub with small holes pierced in the bottom filled to a depth of 90mm of the "forest floor mix" provides sufficient depth for most species. The substrate should be kept moist but not wetted to the extent that it becomes soggy since the eggs need to "breathe" and cannot do so in anoxic conditions.

Once confident that the tub contains batches of eggs it can be removed from the cage containing laying females and netted so that the eggs remain slightly damp but aerated. Eggs should be incubated in a humid but ventilated environment and take 4 to 9 months to hatch at 22 to 28 degrees °C.

The loose mix substrate will prevent asphyxiation or drowning when watering with a sprayer. If the substrate does dry out it is best to put the tub in humid conditions to humidify the substrate before trying to re-wet. Water gently to maintain miscibility and to avoid run off and ponding

in the base of the tub.

I keep the eggs at around 26°C daytime and 16°C night time and they normally hatch after 10 - 16 weeks. A batch of eggs may hatch over 2 - 3 days with a high hatch rate. Proscopiids like some other ground laying families of Orthoptera go through the first moult as they escape from the egg capsule and wriggle their way to the surface.

During the climb to the surface they are maggot like and are known as a vermiform larvae. In this form there are no leg appendages to become damaged as they try to break free of the substrate. A loose forest floor mix will assist this process so that nymphs have the best chance of emerging without impediment.

When the young nymphs hatch, they need airy conditions otherwise they are likely to pick up a fungal / pathogen infection that will go through them and wipe out the culture. Assuming the nymphs survive the first week or two they are likely to go on to produce one of the most endearing invertebrates to keep.

## Acknowledgements

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