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## The final instar exuvium of *Pycna semiclara* Germar, 1834 (Hemiptera: Cicadidae)

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### ABSTRACT

Exuviae of the cicada *Pycna semiclara* were found next to freshly eclosed adults. The exuvium of *Pycna semiclara* is described and illustrated for the first time and a key is presented to distinguish the exuvium of this species from those of *Platypleura stridula* and *Platypleura capensis*, the only other species of cicadas from southern Africa for which exuviae have been described.

KEY WORDS: Afrotropical, Hemiptera, Cicadidae, cicadas, exuvium, nymphs, identification key.

### INTRODUCTION

The life cycles of southern African cicadas have received little attention. The exuviae of only two species have been described (Villet 1989), partly because of the difficulty in identifying them. Many habitats host several cicada species, so that identification has to be made either by direct association with adults or by the use of more expensive molecular tools. To find newly-eclosed adults beside their exuviae is rare because the eclosion process is brief (hours at most) and generally nocturnal.

Descriptions have been published for the nymphs or exuviae of Palaearctic (Kudryasheva 1979; Boulard & Mondon 1995), Oriental (Boulard 2007) and Neotropical (Maccagnan & Martinelli 2011) species. The nymphs or exuviae of several species from tropical Africa have also been depicted (e.g. Boulard 1965, 1971, 1974a–c), but only those of *Platypleura stridula* (L., 1758) and *Platypleura capensis* (L., 1764) from southern Africa have been described (Villet 1989). Older descriptions have focussed only on the forelegs of cicada nymphs, but recent studies have shown that taxonomically useful characters can also be found on the mid and hind legs (Maccagnan & Martinelli 2011).

*Pycna semiclara* Germar, 1834, is one of South Africa's largest cicadas. Its wings are patterned with green, brown and translucent patches that are covered with silvery hairs (Villet *et al.* 2003). Its known geographical distribution lies completely within South Africa, including the Eastern Cape, KwaZulu-Natal, Mpumalanga and Limpopo provinces (Fig. 1). It is generally found in indigenous forest habitats, where the undergrowth rarely grows taller than 1.2 m and where the trees are at least 4 m in height, and in stands of large oak (*Quercus robur*), pine (*Pinus* sp.), gum (*Eucalyptus* spp.) and cottonwood (*Populus deltoides*) trees. It occasionally and uncharacteristically occurs in short, bushy vegetation such as dense riverine bush in KwaZulu-Natal and Eastern Cape valley bushveld (Villet 1987; Villet & Reavell 1989; Villet *et al.* 2003). Males are generally found calling a few meters above ground on an exposed surface in a shady part of a tree, providing a good view of the surrounding area. This position is thought to aid the insect in reducing the risk of predation while calling. Males produce three loud, shrill, piercing calling songs (Villet 1988) that are essential for mate recognition (Villet 1992), and often sing in choruses, especially at dusk and dawn, achieving this by being endothermic (Villet *et al.* 2003).

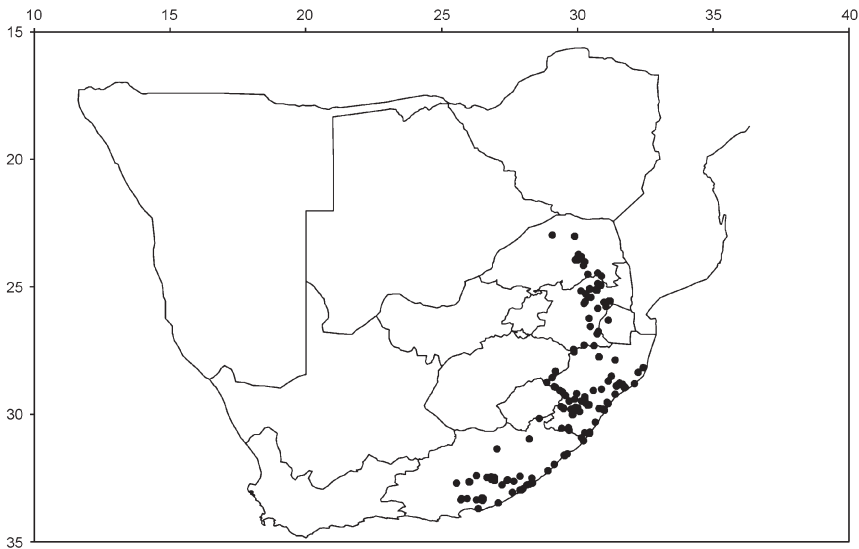


Fig. 1. Distribution of *Pycna semiclara*.

Despite being the most studied cicada species in southern Africa, much remains unknown about this insect and, as for many other species, a description of the nymph has not yet been published. We provide a detailed description and illustrations of the exuvium of the final instar nymph of *P. semiclara* and a key for identification of the few described nymphs of species of cicadas from southern Africa.

#### MATERIAL AND METHODS

Exuviae of final instar nymphs of *Pycna semiclara* were collected alongside freshly eclosed adults. Voucher material is deposited in the Albany Museum (AMGS), Grahamstown, South Africa.

Illustrations were prepared using a Wild M3 stereomicroscope and camera lucida. Where possible, we used the characters proposed in Maccagnan and Martinelli (2011), but as they used mature nymphs and we used exuviae, this was not always possible. In particular, the shape of the head and thorax of exuviae may be distorted due to splitting during eclosion (Motta 2003). Terminology for structures on the forelegs follows Maccagnan and Martinelli (2011).

#### RESULTS

##### *Pycna semiclara* Germar, 1834

Figs 1–3

*Pycna semiclara*: Germar 1834: 82.

#### Description:

##### *Exuvium*.

Body 1.9 cm long, light brown, not narrow or elongated; profile curved. Legs and ventral side sparsely covered with bristles (Fig. 2).

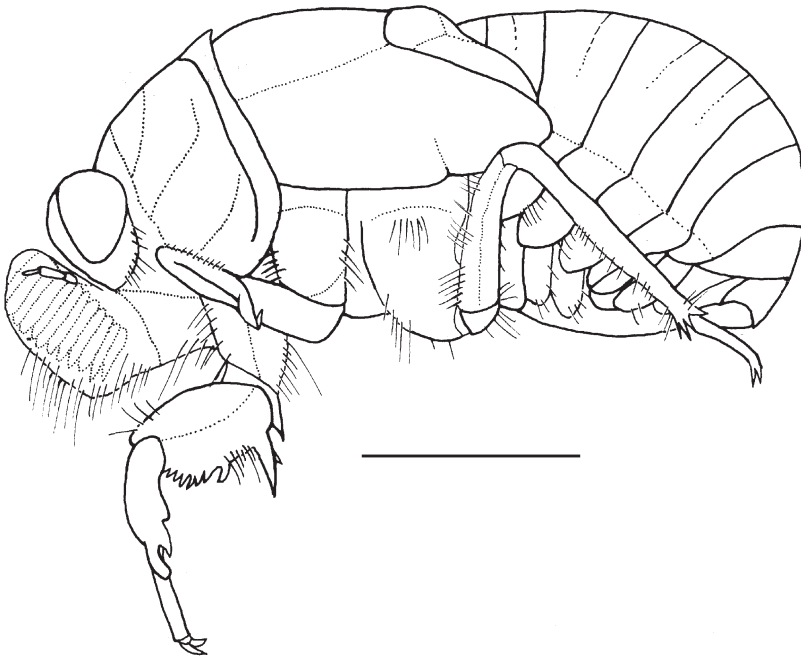


Fig. 2. Lateral view of exuvium of *Pycna semiclara*. Scale bar = 5 mm.

**Head.** In dorsal view, including eyes, about twice as wide as long; slightly wider than anterior margin of pronotum. Antenna small, not extending past clypeus; with six segments. Clypeus in dorsal view rounded, bulbous; profile rounded. Rostrum reaching base of metacoxae.

**Thorax.** Pronotum in dorsal view about half the length of mesonotum. Metanotum very small compared to pronotum and mesonotum. Apex of fore wing reaching third abdominal segment; hind wing reaching third abdominal segment (Fig. 2). Legs and ventral region of thorax with sparse setae. Profemur (Fig. 3A) with posterior tooth long, sharp, curved forward slightly; about 3× as long as wide at base. Accessory posterior tooth small, blunt. Intermediate tooth present. Diastema between intermediate tooth (*itf*) and posterior tooth (*ptf*) wide; diastema between *itf* and *ptf* longer than length of *ptf*. Profemoral comb with 7 teeth. Apical tooth of comb slightly blade-like; pointed. Protibia (Fig. 3A) with well-developed blade; untoothed; with one pointed, well-developed, pre-apical tooth. Apical tooth about 1.5× as long as width of base; separated from previous tooth by deep notch. Protarsus (Fig. 3A) two-segmented; apical tarsomere elongated; protarsal claws of unequal size. Mesotibia (Fig. 3B) without lateral spines or protrusions; with five apical spines, one much smaller than the others. Mesotarsus two-segmented; apical tarsomere elongated; mesotarsal claws of unequal size. Metatibia (Fig. 3C) with four large apical spines and two or three much smaller spines situated slightly higher up on leg and between the larger spines. Hind tarsus (Fig. 3C) two-segmented, apical tarsomere elongated; metatarsal claws of unequal size.

**Abdomen** (Fig. 2). Short, cylindrical in cross section; in dorsal view, lacking distinct waist; with few ventral setae. Abdominal tergites without transverse rows of setae; ter-

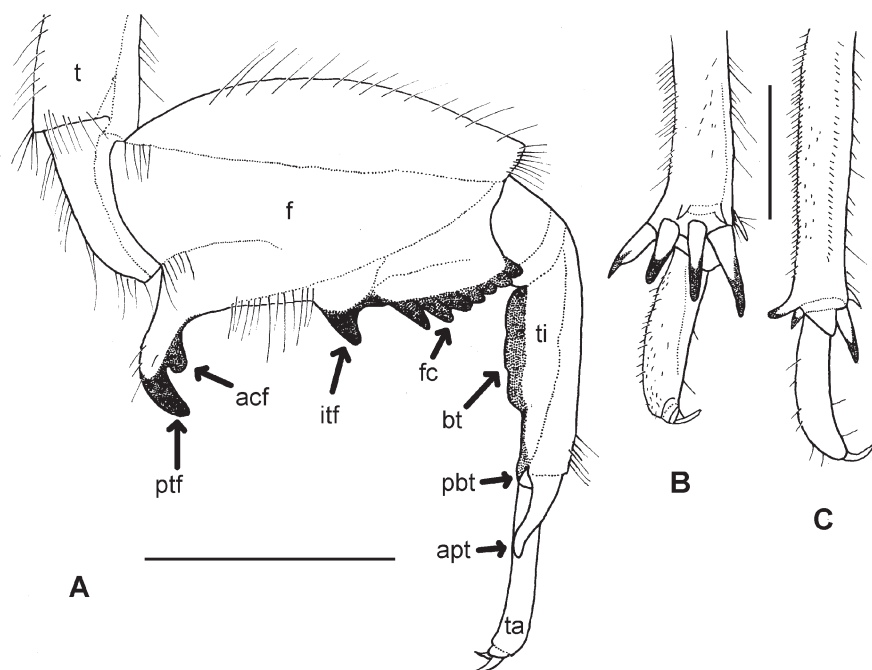


Fig. 3. Exuvium of *Pycna semiclara*: (A) outer lateral view of right foreleg; (B) tibia and tarsus of mid leg; (C) tibia and tarsus of hind leg. Abbreviations: acf – accessory tooth of femur, apt – apical tooth of tibia, bt – blade of tibia, f – femur, fc – femoral comb, itf – intermediate tooth of femur, pbt – point of blade of tibia, ptf – posterior tooth of femur, t – trochanter, ti – tibia, ta – tarsus. Scale bars = 2 mm.

gites 6–10 with sparse hairs; tergite 7 with dark spot either side of midline. Sternites three-quarters the width of abdomen proximal to thorax, tapering distally to one-tenth the width of abdomen; covered with white tomentum. Sternite 1 lacking median protruberance. Sternite 10 of male with a single protrusion, pointed apically.

Material examined: SOUTH AFRICA: *Eastern Cape*: 2 exuviae, 1 teneral adult, Grahamstown, 33°19'06"S 26°32'06"E, 19.xi.2011, J.M. Midgley, from leaves of *Bulbine* sp. growing under *Dais cotinifolia* L. (exuvium and adult) and nearby trunk of *Grevillea robusta* (Cunn.) (exuvium) (AMGS 61197–61199); 1 exuvium, 2 adults, East London, 32°58'48"S 27°54'05"E, 23.xii.2011, C.A. Coombes, from stem of *Syzygium* sp. (AMGS 61673–61675).

#### Key to described exuviae of Southern African cicadas

- 1 Distance between *itf* and *pft* longer than *pft* (Fig. 2). Antennae short, not reaching beyond front of head ..... ***Pycna semiclara***
- Distance between *itf* and *pft* as long as *pft* (see Villet 1989: fig. 3). Antennae long, reaching beyond front of head.....2
- 2 Clypeus somewhat pointed in profile. Abdomen curved downward, with distinct waist in dorsal view. Gap between bases of *itf* and *pft* wide and rounded ..... ***Platyleura stridula***
- Clypeus rounded, bulbous in profile. Abdomen at most slightly curved, without waist in dorsal view. Gap between bases of *itf* and *pft* narrow and pointed..... ***Platyleura capensis***

## CONCLUSION

This study of *P. semiclara* represents the first comprehensive description of an Afrotropical cicada nymph's exuvium. To date, the exuviae of only three species occurring in Southern African have been described, so caution should be used when identifying species, particularly if they have not been collected within the known range of the described species. Future descriptions of Afrotropical cicada species should include details of all legs to allow detailed comparisons; and when intact mature larvae are available, the shape of the head should be taken into account (Motta 2003; Maccagnan & Martinelli 2011).

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