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THE LAST INSTAR LARVAE OF THE SOUTHERN AFRICAN ENDEMICS *AESHNA MINUSCULA* McLACHLAN, 1896 AND *A. SUBPUPILLATA* McLACHLAN, 1896 (ANISOPTERA: AESHNIDAE)

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In the past, there has been confusion in taxonomy of southern African aeshnids. From this confusion has arisen muddled and unreliable descriptions of the larvae. There are 2 confirmed good *Aeshna* spp., both of which are endemic to southern Africa. Here the larvae are redescribed in detail, having been reared through in the laboratory. A comparison is also made between larvae of *A. subpupillata* and its close relative *A. rileyi*, which occurs further N in Africa.

INTRODUCTION

Aeshna minuscula McLachlan 1896 is southern African with a range extending from Namibia and the Cape across to Natal and the Transvaal. BARNARD (1937) described the larva of the species without illustrating the whole insect. Also, his descriptions of the mask and palpus are poor and confusing. PINHEY (1959) referred to Barnard's paper without adding further information.

A. subpupillata McLachlan 1896 is also southern African, ranging from the Cape through Natal and the Transvaal, but with a distinct preference for montane biotopes (PINHEY, 1985). For many years, this species was regarded as a synonym of *A. rileyi* Calvert 1892, but was separated by PINHEY (1981). BARNARD (1937) considered *A. rileyi*, but included some references to *A. subpupillata* by previous authors. BARNARD (1937) described the larval morphology of *A. rileyi*, but did not report the localities, leading to further confusion.

PINHEY's (1959) description of the larva of *A. rileyi* is certainly not *A.*

subpupillata as the specimens were from Tanzania. This leaves the larva of *A. subpupillata* still to be described.

This paper describes in detail the larva of *A. minuscula*, and provides a fuller description of *A. subpupillata*, comparing it with *A. rileyi*.

MATERIAL AND METHODS

A. minuscula: 11 last instar larvae (4 ♂, 7 ♀, from several pools above 1200 m a.s.l., nr Cathedral Peak, Drakensberg, Natal, I-1990, M.J. Samways leg.)

A. subpupillata: 3 last instar larvae (1 ♂, Ashburton, Pietermaritzburg, Natal, 14-I-1991, T.E. Clark leg., – 1 ♀, Hilton, Natal, 9-I-1989, M.J. Samways leg., – 1 ♀, Umlambonja River, Cathedral Peak area, Natal, 25-I-1991, G. Carchini leg.)

The larvae were reared in the laboratory through to adult emergence, stored in 75% ethyl alcohol, measured and drawn with a stereomicroscope and camera lucida.

CORBET's (1953) terminology for the labium was used.

DESCRIPTIONS

AESHNA MINUSCULA McLACHLAN

Figures 1-4

Body length 40 mm, colour light brown, weakly granulate. Head as typical for the genus, with large, spherical eyes. Antennae 6-segmented, the third segment being the longest. Distance between antennae insertions less than antennae length (Fig. 1).

Prementum relatively short. In some specimens, the prementum had a few small spiniform setae near the lateral margins. All specimens had thin and short setae from the palpus insertions along the lateral margins of the prementum to about almost half its length. Distal margin of prementum with a line of light-coloured, thin setae (Fig. 2).

Palpus with a group of setae and movable hook with a line of four, long setae. Inner and distal margins of palpus feebly crenulated, with an obtuse inner angle (Fig. 3).

Thorax and wing sheaths finely spotted. Prothorax with bifid supracoxal projections. Articulation between prementum and postmentum at the level of the mesocoxae.

Abdomen long, with dorsal dark spots from the 4th to 9th segments. The 7th to 9th segments bear massive and sharp lateral spines. The lateral margins of the 9th and 10th segments and the anal pyramid are setose.

Epiproct is a little shorter than the paraprocts. Cercus length about half that of the paraproct length (Figs 1, 4).

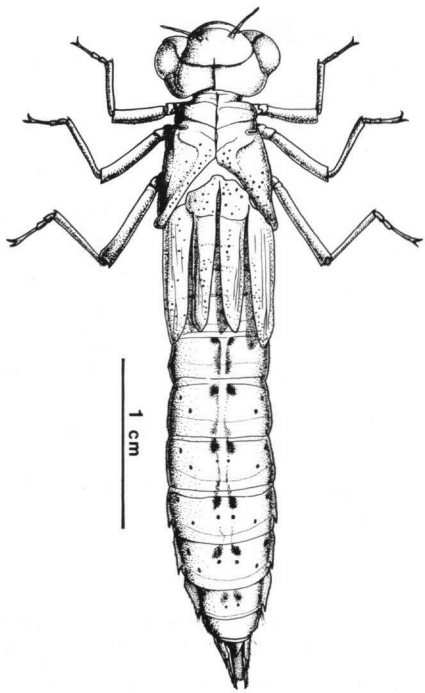


Fig. 1. *Aeshna minuscula* McLachlan, exuviae.

AESHNA SUBPUPILLATA McLACHLAN

Figures 5-10

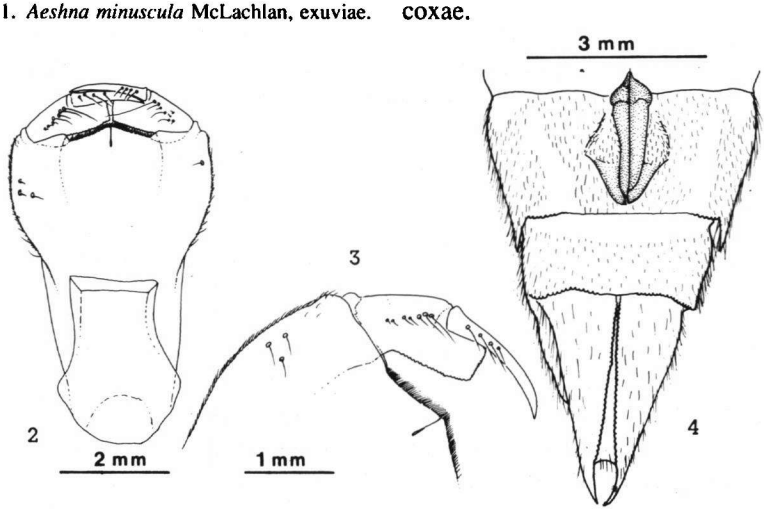
Body length 45 mm, colour brown, granulate and glabrous.

Eyes large and spherical. Antennae 6-segmented, the 3rd segment being the longest. Distance between antennae insertions more than antennae length (Fig. 5).

Prementum with granulation along the lateral margins, and with a line of short, thin setae on the distal margin (Fig. 6).

Palpus without setae, distal and inner margin feebly crenulated with a distinctly right-angled inner corner. Movable hook long, sharp and gently arched, without setae (Fig. 7).

Thorax granulate, except for the wing sheaths. Prothorax with a bifid supracoxal projection (Fig. 8). Articulation between the prementum and postmentum at the level of the mesocoxae.



Figs 2-4. *Aeshna minuscula* McLachlan: (2) last instar larval mask; – (3) last instar larval palpus; – (4) terminal segments of the ♂ abdomen.

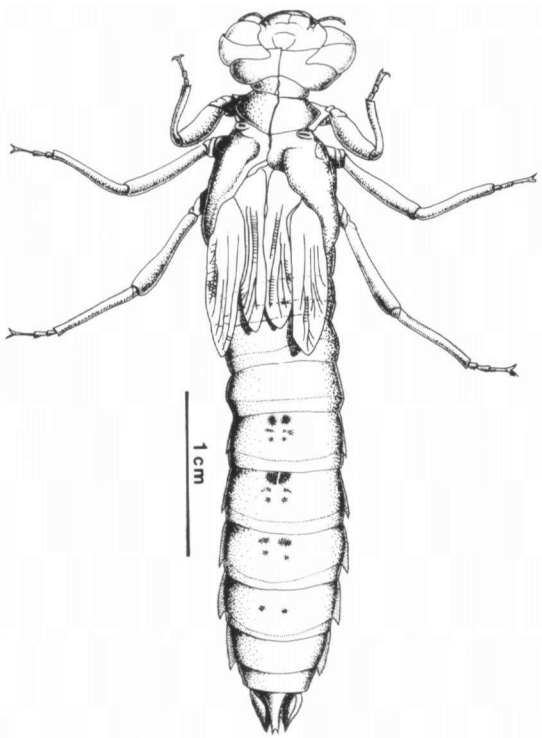


Fig. 5. *Aeshna subpupillata* McLachlan, exuviae.

Abdomen long, strongly granulate, without setae. Epiproct and paraprocts nearly equal in length, and less than the combined lengths of the 9th plus 10th segments. Epiproct with a narrowly cleft apex. Male projection almost triangular in shape, but the posterior angle rounded, about two--thirds the length of the epiproct (Fig. 9). Cerci granulate, nearly as long as the epiproct (Figs 9, 10).

BIOTOPES

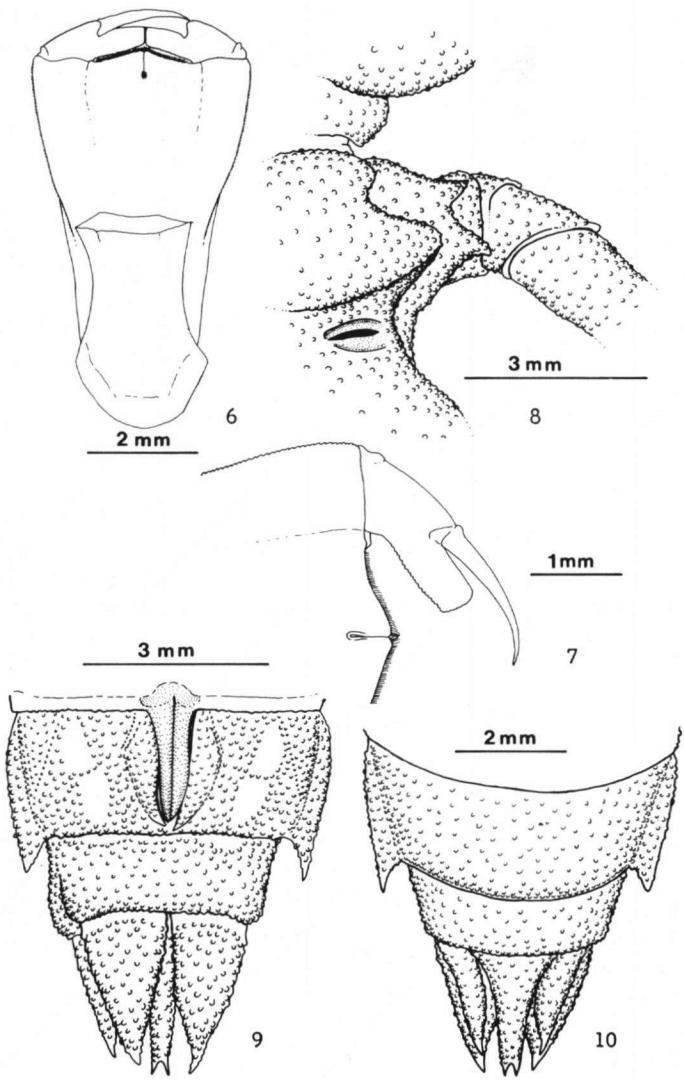
In Natal, *A. minuscula* is a high altitude species. Along a transect at latitude 29°S, it occurs from about 800 m a.s.l. to at least 2200 m a.s.l. *A. minuscula* is associated with permanent montane ponds and slow-moving reaches of dammed streams that have edges densely vegetated with sedges, grasses and forbs. The larvae have only been collected in still water.

At the same latitude, *A. subpupillata* occurs between 600 m a.s.l. and about 1600 m a.s.l. and possibly occasionally at higher altitudes. This species is distinctly riverine, associated with fairly fast moving streams, especially those 2-3 m wide with glides and riffles. Although the adult patrols sunlit streams with well--vegetated banks, they will also pass occasionally under tree canopies. The larvae were collected from sunlit riffles.

DISCUSSION

In southern Africa, the larvae of the two species, *A. minuscula* and *A. subpupillata* have distinct biotope preferences both as adults and as larvae, the first lentic and the second lotic.

The description given here of the larva of *A. minuscula* complements the weak description of BARNARD (1937).



Figs 6-10. *Aeshna subpupillata* McLachlan: (6) last instar larval mask; – (7) last instar larval palpus; – (8) prothorax, showing the bifid supracoxal projection; – (9) terminal segments of the ♂ abdomen, from below; – (10) the same, from above.

The determination here of the larva of *A. subpupillata* differs substantially from those of BARNARD (1937) and PINHEY (1959), which appear to be *A. rileyi*. The differences between these two species are given in Table I. The larval

Table I

Comparison of last-instar larval morphological characters of *Aeshna subpupillata* (this paper) and *A. rileyi* (BARNARD, 1937; PINHEY, 1959)

Character	*subpupillata*	*rileyi*
Body length	45 mm	37-39 mm
Abdominal setae	absent	dense, short
Supracoxal projection	bifid	single
Lateral spines present on:	5S-9S	6S-9S
Anal pyramid/10S + 9S ratio	< 1:1	1:1
Cercus/epiproct ratio	almost 1:1	2:3
Male projection shape	rounded	pointed
Projection/epiproct ratio	2:3	1:2

morphology supports the contention that these are two good species, with *A. subpupillata* having a southern African distribution, being replaced by *A. rileyi* further north on the continent.

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