

Linzer biol. Beitr.	32/1	235-240	31.5.2000
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## The *Acanthaeschna* Story (Odonata: Aeshnoidea)

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**Abstract:** Significant details of the history of discovery and rediscovery of *Acanthaeschna victoria* MARTIN are presented, together with the description of its supposed larva and a discussion of its possible systematic position, ecology and distribution.

**Key words:** *Acanthaeschna victoria*, rediscovery, larva (description), ecology.

### Introduction

*Acanthaeschna victoria* was the first Australian telephlebiid (sensu BECHLY 1996) known to science (SELYS 1883) even though its formal description is credited by ALLBROOK & WATSON (1979) to MARTIN (1901). It is the only telephlebiid species of which more than one specimen were available in the major European collections (Brussels, Paris, possibly London) before 1900. After that, however, *A. victoria* seemed to be lost for more than half a century. Neither Tillyard nor Tony Watson, Tony O'Farrell, Roderick Dobson or any other specialised dragonfly collector have ever collected or even seen live *A. victoria*. In spite of that, however, ALLBROOK & WATSON (1979) were able to dig out, from the University of Queensland collection, a female of the species collected by a non-odonatologist student (labelled "Brisbane, 14.X.1958, B.W. Cull"). My own continuous search in museum collections produced a male that again was collected by a non-odonatologist student (labelled "Herston, 3.X.1966, E. Phipps, above water").

The apparent occurrence of *A. victoria* in Brisbane and its peculiar appearance including morphology and colouration (see photo 1), made L. Müller and I look for it in all sorts of habitats from large rivers to mangrove situations and in habitats known for semi-terrestrial or terrestrial dragonflies. However, the species was not found.

The fact that a large dragonfly species apparently not uncommon last century seemed impossible to find a hundred years later, concerned me, and by about 1985 I started to doubt that it was still out there.

The surprise trapping of 2 rather old *A. victoria* females (labelled "New South Wales, Lorien Ref., 3 km N Lansdowne near Taree, rainforest margin, malaise, 13 to 21 Dec. 1987, G. Williams") gave reason for some hope again. Efforts to find the species were shifted to various rainforest habitats including tree holes and caves but as in the other biotypes, *A. victoria* remained lost to dragonfly collectors.

In spite of the failure of all dragonfly collectors to find *A. victoria*, L. Müller and I did not

stop trying. After more than a decade of frustrating attempts we made another collecting trip in October 1999 but dedicated it mainly to south-eastern *Petalura* LEACH. As it turned out, the trip (October 15-24) was too early in the season for *Petalura*. Thus focusing again on *Acanthaeschna*, we planned to go where experienced dragonfly collectors would go in order not to find dragonflies, particularly specialised ones. Just by accident such a place offered itself next morning near Broadwater. It was an apparently at least summer-dry ditch covered with dry Sphagnum and with some Grass Trees (*Xanthorrhoea* sp.) and Paperbark (*Melaleuca* sp.). The place did, however, surprise us right away when we noticed numerous larvae of *Aeshna brevistyla* (RAMBUR) and *Hemicordulia australiae* (RAMBUR) under logs and bark on completely dry ground. After unsuccessfully searching for other larvae we decided to leave the otherwise not exciting place. On the way out, at about 1015 a.m., however, I noticed a copula of what could only be *A. victoria*, hanging motionless at about 1.2 m height in a Grass Tree. The pair was netted and its identity was confirmed. Subsequent search for more adults and larvae was not successful. After some collecting further north and more inland we went to Brisbane and studied the dragonfly collections of the Queensland Museum and of the University of Queensland. This revealed another female of *A. victoria*, again collected by a non-odonatologist (labelled "Elanda Point, to Kin Kin Ck, 17.11.1985, G. & A. Daniels"). On the way back south we revisited the place near Broadwater where we had found *A. victoria*, and nearby found another possibly temporal watercourse without noticeable flow and with some *Eucalyptus* spp. and Wallum (*Banksia aemula*) along one edge. In this bushland, at about 1100 a.m., we noticed an aeshnid displaying a behaviour we had never seen from any other dragonfly. In fluttering flight it kind of "jumped up and down" the trunks of Wallum trees without paying much attention to anything else. It was caught and turned out to be a male of *A. victoria*. During the next 30 minutes or so, four more males, all *A. victoria*, were observed behaving almost exactly the same way. As we did not see that food was taken from the tree trunks and as the strange behaviour involved only males we concluded that they tried to locate or chase up females from the shade of tree trunks in this very hot and dry habitat. As long as we observed the males, they did not find any females nor did we; we also did not get exuviae or larvae along the watercourse so we decided to return in September 2000.

However, after it had taken us nearly 35 years to find adults of *Acanthaeschna victoria* (still probably the first and only odonatologists to do so), things got moving a bit faster. Only one month later, on November 22nd, I identified aquatic macroinvertebrates collected from Wooli Wooli River during an MRHI (monitoring river health initiative) survey. Amongst lots of other stuff, including several larvae of *Episynlestes albicauda* (TILLYARD), there was a well preserved male aeshnoid larva, which would have emerged probably the next day or so. It was an apparently undescribed larva but considering its size and what is known of ecology, phenology and distribution of Australian aeshnoids, it is most probably *Acanthaeschna victoria* and will be described as this species below. There are also indications that this identification is correct, in the proportions of head and anal pyramid. Other considerations in favour are that if we do not associate the above larva with *A. victoria*, we are in the possession of apparently geographically and ecologically coexisting aeshnoid adults with larvae unknown, and of aeshnoid larvae with adults unknown in an odonatologically reasonably well explored area.

So far, so good. However, only another two weeks later when the work on *Petalura* was continued with some success (first record of *P. litorea* THEISCHINGER for New South Wales (S of Brooms Head)), we visited the only recent collecting spot of *Acanthaeschna* again. It

was as incredible as it was devastating to find that within only 6 weeks large areas immediately adjacent to the "historic site" had been cleared, with all major vegetation bulldozed down and accumulated in a few places, and that road-like fragmentation of even larger areas had taken place. There was of course no sign of *Acanthaeschna*, and it is very doubtful if there will even be access to the area when we shall try to search for larvae in 2000.

### Description

#### *Acanthaeschna victoria* MARTIN

*Acanthaeschna victoria* SELYS 1883: 732 (nomen nudum); MARTIN 1901: 233; LIEFTINCK 1951: 28; ALLBROOK & WATSON 1979: 323; WATSON et al. 1991: 178; HAWKING & THEISCHINGER 1999: 100.

*Austroaeschna victoria* MARTIN 1909: 89; MARTIN 1911:16; FRASER 1960: 35.

Larva (Figs 1-7)

Dimensions: Total length approximately 35 mm; width of head across eyes 7.2 mm; length of prementum 5.5 mm, width at distal end 4.1 mm, width at base 1.6 mm; length of metafemur 5.7 mm; length of abdomen approximately 23.5 mm; greatest width 6.5 mm.

Colouration: Largely yellowish brown; densely punctate almost all over.



Photo 1. *Acanthaeschna victoria* MARTIN, male (Photo: L. Müller)

**M o r p h o l o g y :** Labium elongate; prementum about 1.35 times as long as its greatest width, distally about 2.5 times as wide as basally, with only one clearly visible tooth on each side of the ligula some distance from well developed median cleft. Labial palps with lobe subrectangular, truncate, inner margin with about 22 more or less clearly defined teeth including small end-hook; several very small and short palpal setae and around 6 minute setae along movable hook. Antennae 7-segmented. Eyes laterally strongly protruding; postocular lobes unarmed, their lateral margin longer than eye radius. Angle between subtriangular prothoracic processes about 60°; notal lobes small, close to right-angled. Synthorax armed slightly at base of mesopraecoxa; metathorax and legs unarmed. Lateral spines on abdominal segments 6-9 only, spines on 6 minute, on 7-9 quite substantial, and on 9 also rather wide; mid-dorsal spines absent; all abdominal terga well arched, tergum 10 without mid-dorsal cone. Anal pyramid short, with epiproct stout, trapezoid and very slightly bifid, markedly shorter than very deep paraprocts; male projection wide, subtriangular, apically rounded, markedly longer than cerci which are less than 1/4 length of paraprocts.

**M a t e r i a l e x a m i n e d :** 1 final instar male larva, NSW EPA survey – MRHI, New South Wales, Woolli Woolli River, 29.878°S/153.168°E, edge sample, 6.10.99, Brian Hughes (in Collection G. Theischinger).

### Discussion

The larva we believe to be *Acanthaeschna victoria* seems telephlebiid in structure, particularly eyes, labium and anal pyramid in general, but also shows characters (epiproct, setation of labial palps) characteristic of Aeshnidae.

If we accept the long-standing synonymy of *Acanthaeschna* with *Austroaeschna* (MARTIN 1909, FRASER 1960), the paper of ALLBROOK & WATSON (1979) and the systematic treatment of BECHLY (1996) as indication of the affinities of *Acanthaeschna*, the genus is telephlebiid (subfamily Austroaeshninae). The aeshnid characters of the larva would then have to be interpreted as convergent in context with the more aeshnid life-style. There is, however, also the possibility that *Acanthaeschna* is much more primitive and the sister group of one or several higher aeshnoid taxa. Hopefully competent future cladistic and molecular analyses will give a clearer and more secure picture of its systematic position.

At this stage it appears that *A. victoria* is ecologically not highly specialised. It seems that temporary low altitude swamps, slow streams and rivers near the coastline are its habitats. Its distribution is now known to reach from Elanda Point (ca 26°15' S) in Queensland to near Taree (ca 32°S) in New South Wales, and it seems to be a diurnal rather than crepuscular spring species appearing early in October. It is obvious that land containing habitats as described above, has been extensively transformed this century by human activities. It is now settlements, pasture and sugar cane country, and as reported above, these and other kinds of development continue into the next century. We can only hope that the chain of coastal National Parks in southern Queensland and northern New South Wales contains other localities where *A. victoria* can continue to exist.

As the publication of a field guide to the Australian Odonata is forthcoming and as it is supposed to include vernacular dragonfly names, this paper is probably as good a place as any to start production. "Thylacine Dragonfly" appears appropriate for a more or less cream-coloured species with prominent black lateral stripes and with a recent history not unlike that of the Tasmanian Tiger but hopefully with a happier ending.

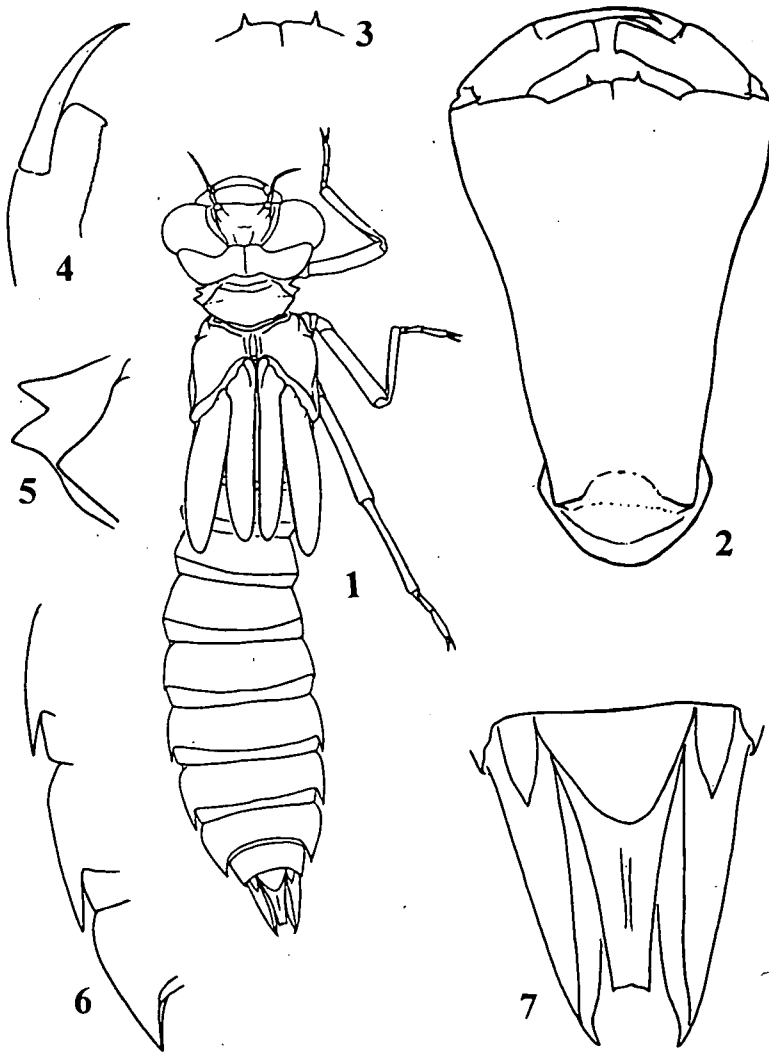
### Acknowledgments

I wish to thank all persons who made contributions to the above story. They are: Dr D. Bickel and L. Müller (Sydney), G. Daniels and M. Schneider (Brisbane), Dr S. Dunkle (USA), Dr G. Williams (Lansdowne). I also wish to acknowledge help in many ways from the MRHI team of EPA (Environment Protection Authority) New South Wales (J. Potts, N. Waddell), under the management of Dr P. Scanes and E. Turak. Special thanks go to B. Hughes (Grafton) who collected the sample including the supposed larva of *Acanthaeschna victoria*.

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Figs 1-7. *Acanthaeschna victoria* MARTIN, final instar male larva (supposition): 1 – dorsal aspect; 2 – labium and labial palps, ventral aspect; 3 – premental ligula, ventral aspect; 4 – right labial palp, ventral aspect; 5 – left pronotal lobe, dorsal aspect; 6 – left edge of segments 7-9, dorsal aspect; 7 – anal pyramid, dorsal aspect.

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Zeitschrift/Journal: [Linzer biologische Beiträge](#)

Jahr/Year: 2000

Band/Volume: [0032\\_1](#)

Autor(en)/Author(s): Theischinger Günther

Artikel/Article: [The Acanthaeschna Story \(Odonata: Aeshnoidea\). 235-240](#)