

## The larva of *Synthemipsis gomphomacromioides* TILLYARD (Odonata: Synthemistidae)

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**Abstract:** The larva of *Synthemipsis gomphomacromioides* TILLYARD is described, illustrated and compared with the larvae of the other Tasmanian synthemistid species and with all other Australian synthemistid genera.

**Key words:** *Synthemipsis gomphomacromioides*, larva (description).

### Introduction

TILLYARD (1917) described adult *Synthemipsis gomphomacromioides* and commented on the morphology of the larva based on a larval skin found close to a freshly emerged individual and another larval skin of an individual found transforming.

ALLBROOK (1979) used TILLYARD's (1917) brief description for keying out the three synthemistid species known from Tasmania, mentioning that since TILLYARD (1917) no nymphs of *S. gomphomacromioides* had been positively identified.

Studying Australian Gomphomacromiinae (THEISCHINGER & WATSON 1978) and their larvae (THEISCHINGER & WATSON 1982) I became quite interested in the larva of *Synthemipsis* but found that TILLYARD's larval material was no longer available (T. WATSON, pers. comm.; D. GOODGER, recent confirmation).

CARLE (1995) erected the tribe Synthemipsini, and did not mention and apparently also did not have the larva of *Synthemipsis*.

In 1994 I decided to spend a holiday in Tasmania and to search for the larva of *Synthemipsis*. Right at the start these attempts lead to a heavy fall in a rocky and slippery situation resulting in fractured ribs. However, with my wife's help I continued the search in an area where I had observed a freshly emerged female of *Synthemipsis gomphomacromioides* and in another place where adults of the species were not uncommon. Finally a female synthemistid exuviae and several larvae were collected. The excitement, however, only lasted until at home - using the then available literature - this material was identified as *Synthemis* (now *Archaeosynthemis*) *macrostigma orientalis* TILLYARD.

Analysing the *Eusynthemis guttata* group of species (THEISCHINGER 1995, 1998) I discovered that larvae of *Eusynthemis guttata* SELYS and what we still call *Archaeosynthemis macrostigma orientalis* (TILLYARD) had been mixed up by most previous workers (including HAWKING 1986) and I found characters to clearly separate *Eusynthemis* and *Archaeosynthemis* larvae (presented in HAWKING & THEISCHINGER 1999).

Early in 1999, L. Müller and I had another go at the "Tasmanian holiday synthemistid larvae" and compared them with "*Archaeosynthemis macrostigma orientalis*" from the mainland. That day we ended up no longer sure that my initial identification was correct. Subsequent detailed study in October 1999 finally convinced me that the "Tasmanian holiday synthemistid larvae" are in fact of the genus *Synthemiosis* and that ribs were not broken in vain. It also became rather obvious that TILLYARD's (1917) description of the *Synthemiosis* larvae results from a confusion, possibly with *Synthemis tasmanica* TILLYARD, and that accordingly ALLBROOK's (1979) key cannot work for the separation of *Synthemiosis* and *Synthemis tasmanica* larvae. This and the fact that the larvae of *Synthemiosis* will be of significance in future phylogenetic studies triggered the present paper.

## Description

### *Synthemiosis gomphomacromioides* TILLYARD

*Synthemiosis gomphomacromioides* TILLYARD 1917: 464; FRASER 1960: 42; WATSON et al. 1991: 228.

#### Larva (Figs 1-7)

**D i m e n s i o n s :** Total length approximately 22 mm; width of head across eyes 4.9-5.1 mm; length of prementum 3.7-4.0 mm, width at distal end 4.0-4.2 mm, width at base 1.1 mm; length of metafemur 4.7-4.9 mm; length of abdomen approximately 14.3 mm; greatest width 5.9-6.2 mm.

**C o l o u r a t i o n :** brown.

**M o r p h o l o g y :** Prementum not widening abruptly from base; ligula with median lobe very large but not clearly defined; generally 5 primary premental setae and 4-5 secondary setae; labial palps with 4/5 dentations including a very small one next to the movable hook and generally 5 larger palpal setae; frontal plate not strongly developed, reaching to end of pedicels, with rather sparse setae or long hairs along margins; eyes strongly protruding laterally and dorsally; no fringes of hair along posterior eye margins; postocular lobes simply rounded, not differentiated. Pronotal lobes well rounded, with long prominent setae. Abdominal terga with sparse setae and rather sparse long thin hairs along posterior margins; no dorsal or lateral processes; epiproct with base wide and apex sharply pointed,  $\frac{3}{4}$  length of rather stout but acutely pointed paraprocts; cerci approximately  $\frac{1}{3}$  length of paraprocts.

**M a t e r i a l e x a m i n e d :** 1 final instar female exuviae, Tasmania, near Mt Darwin, West Coast Range, 12-23.2.1994, G. and C. Theischinger; 2 final instar female larvae and 2 smaller larvae, Tasmania, Mt Field, 21.2.1994, G. and C. Theischinger (all in Collection G. Theischinger).

## Discussion

It should be stressed that the identification of the *Synthemiosis* larvae described in this paper has not been confirmed by breeding out. The finding of a female exuviae close to the place where a freshly emerged female had been collected and the collecting of larvae at a

locality where adults were abundant is not more convincing than TILLYARD's (1917) association of *Synthemopsis* adults and exuviae. However, TILLYARD who had done a magnificent job with larval diagnoses in his *Synthemis* monograph earlier (TILLYARD 1910) described the exuviae of *Synthemopsis* as closely similar to those of *Synthemis tasmanica* but of more slender build, with more prominent eyes and a more projecting frontal shelf. TILLYARD also stated that the whole larva strongly resembles that of a *Cordulegaster* and that the teeth of the lateral lobes of the labium are of about the same size and number as in *Synthemis eustalacta*. All this could indicate that TILLYARD had only exuviae of *Synthemis tasmanica* that look more slender than the larvae described above as *Synthemopsis* and which would more resemble *Cordulegaster*.

The arguments for the correct identification of the *Synthemopsis* material described in this paper, besides local association are: Only three synthemistid species, *Archaeosynthemis macrostigma orientalis* (TILLYARD), *Synthemopsis gomphomacromioides* TILLYARD and *Synthemis tasmanica* TILLYARD, are known from Tasmania (ALLBROOK 1979, WATSON et al. 1991). The adults of both *A. macrostigma orientalis* and *S. tasmanica* have long, slender anal appendages which is reflected by their final instar larvae having long cerci and a slender epiproct. The adults of *Synthemopsis gomphomacromioides* on the other hand have short, stouter anal appendages which is reflected in the larval material (final instar) described above by short cerci and a stout epiproct. On top of that, the larvae I consider as *S. gomphomacromioides* can be readily distinguished from all other Australian synthemistid genera. They have setae or long hairs along the margins of the frontal plate as opposed to scale like setal structures in *Austrosynthemis* CARLE, *Choristhemis* TILLYARD, *Eusynthemis* FÖRSTER and *Tonyosynthemis* THEISCHINGER. They lack fringes of hair along the posterior eye margin and have short cerci as opposed to the strong "eye brows" and long cerci of *Archaeosynthemis* CARLE, *Parasynthemis* CARLE and *Synthemis* SELYS.

As the frontal lobe of the premental ligula and the palpal dentations of *Synthemopsis* larvae are distinctly larger than in any other Australian synthemistid genus (as known before 2000), I consider it quite possible that ALLBROOK (1979) illustrated a labial palp of and keyed out *Synthemopsis* as *Synthemis macrostigma orientalis*.

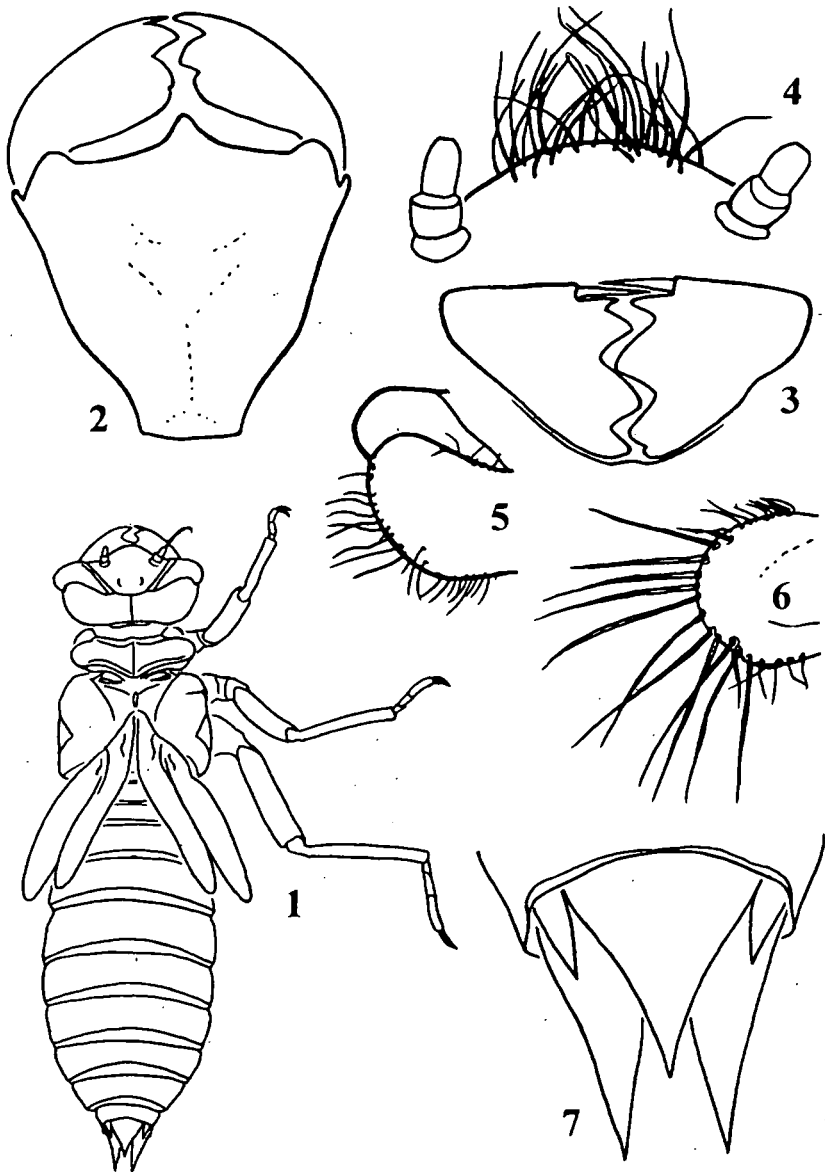
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### References

- ALLBROOK P. (1979): Tasmanian Odonata. — Fauna of Tasmania Handbook No. 1. (University of Tasmania, Fauna of Tasmania Committee: Hobart).
- CARLE F. (1995): Evolution, taxonomy, and biogeography of ancient Gondwanian libelluloidea, with comments on anisopteroid evolution and phylogenetic systematics (Anisoptera: Libelluloidea). — *Odonatologica* 24: 383-424.
- FRASER F.C. (1960): A handbook of the dragonflies of Australasia. With keys for the identification of all species. — Royal Zoological Society of New South Wales, Sydney.





Figs 1-7. *Synthemopsis gomphomacromioides* TILLYARD, final instar larva (supposition): 1 – dorsal aspect; 2 – prementum and labial palps, ventral aspect; 3 – labial palps, frontal aspect; 4 – frontal plate, dorsal aspect; 5 – left eye and postocular lobe, dorsal aspect; 6 – left pronotal lobe, dorsal aspect; 7 – anal pyramid, dorsal aspect.