

***Austroaeschna ingrid* sp. nov.**
from Victoria, Australia (Odonata: Telephlebiidae)

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ABSTRACT

Austroaeschna ingrid, a new telephlebiid from the Grampians in Victoria, Australia, is described (holotype: McKenzie Falls, 21-23 January 2008, to be deposited in Museum of Victoria, Melbourne). This species is most similar to *A. christine*, *A. multipunctata* and *A. obscura* but may be distinguished by the length and slenderness of the male anal appendages, particularly the long and narrow appendix inferior, by the pointed female occiput and by the small yellow pattern elements on the front of the synthorax. The larva of *A. ingrid* stands out by the very slender elements of the anal pyramid.

INTRODUCTION

The bulk of relevant taxonomic and distributional information on adults and larvae of the genus *Austroaeschna* Selys is comprehended in three major papers (Theischinger 1982, 2002; Peters & Theischinger 2007). In the latest of these studies some confidence was expressed that all species of this genus were known. Subsequently, however, we (Günther Peters and GT) found inconsistencies in *A. subapicalis* Theischinger that required a closer look at the Grampians population of this species. As 2005 I had committed myself to do, as an addition to the work for the federal project SRA (Sustainable Rivers Audit), a monograph on the dragonflies of the Murray Darling catchment and as part of the Grampians belongs to this catchment, my wife and I spent part of our 2008 holiday for the necessary investigation. The preliminary result is that the *A. subapicalis* population from the Grampians does not differ sufficiently from other populations of this geographically variable species to be split off. Surprisingly, however, I discovered that what had hitherto been identified as *A. multipunctata* Martin from the Grampians differed significantly from all other populations of this species in the shape of the male appendages and other relevant characters and must be regarded as an undescribed species. It is described below. As a byproduct two more new records of telephlebiid species from the Grampians can be provided.

Austroaeschna ingrid sp. nov.
(Figs 1a-e, 2, Plate III)

Etymology

The species is named for my granddaughter Ingrid, her name being used as a noun in apposition to the generic name.

Specimens studied

Holotype ♂: Australia, Victoria, Grampians, McKenzie Falls (39°06'44"S, 142°24'20"E; 380 m a.s.l.), 21-23 i 2008 leg. GT, to be deposited in the Museum of Victoria. — Paratypes (all from Australia, Victoria, Grampians): 1 ♂, 2 ♀, 3 final stadium exuviae, same data as holotype; 11 ♂, 5 ♀, Rosea Creek Track (37°10'59"S, 142°28'53"E; 670 m), 22-25 i 2008 leg. GT; 2 final stadium exuviae, Scrubby Creek (37°09'41"S, 142°26'39"E; 290 m), 23-26 i 2008 leg. GT; all these paratypes to be deposited in Museum of Victoria, Melbourne; Australian National Insect Collection (ANIC), Canberra; Australian Museum, Sydney; and coll. GT, Sydney. 1 ♂, Dairy Creek, 1 km above Silverband Falls, 20 i 1978, collector unknown (ANIC); 1 ♂, Mt William, 21 i 1978, collector unknown (ANIC); 2 ♂, waterfalls nr Halls Gap, 24 i 1984 leg. GT (ANIC).

Diagnosis

A very dark, yellow-spotted telephlebiid typical of the *multipunctata* complex of the genus *Austroaeschna*. Distinguishable from all species of the genus by the combination of the yellow-spotted front of the synthorax together with the presence of anterodorsal, mediodorsal and posterodorsal yellow spots on S3-8, the great length and slenderness of the appendix inferior of the male, the obtusely pointed occiput of the female and the long, slender and sharply pointed elements of the anal pyramid of final stadium larvae.

Description of holotype male

Head: Labium yellowish to reddish brown; labrum black with well-defined yellow butterfly-shaped median mark, divided by fine black midline; anteclypeus brownish black; postclypeus pale greenish yellow with the lateral lobes and along lateral portions of epistomal suture black; anterior frons black; sides of frons yellow, top of frons black with yellow spot each side; mandibles blackish brown; genae, vertex, antennae, postgenae and occiput black; eyes blue in life, pale in preserved specimen. **Thorax:** Prothorax greyish brown to black with narrow rim of anterior lobe yellow. Spiracular dorsum and mesostigmatic lamina brown to black; dorsal carina largely black, only basal portion narrowly lined with yellow; antearlar ridge and sinus blackish brown; mesanepisternum black with curved inner more ventral and curved outer more dorsal line, dorsal spot immediately in front of antearlar ridge and just dorsal to antearlar sinus yellow; mesokatepisternum with small yellow basal spot; sides of synthorax black, marked with yellow as follows: narrow curved line, narrowly broken into two subequal sections, in dorsal ¼ of mesepimeron, narrow unbroken line in dorsal ¼ of metepisternum, a small spot each anteroventral and posterodorsal to metathoracic spiracle, a small patch each in dorsal and in ventral portion of met-

epimeron; terga black except for yellow mesoscutellum and yellow midline of mesoscutum; poststernum pale brown to, largely, black. — Legs: coxae black; trochanters blackish brown; femora black with basal portion, smallest in fore leg, largest in hind leg, reddish brown; fore tibia black, middle tibia largely black, dark brown on outer face, hind tibia largely brownish red with only base and apex blackened; tarsi black; claws dark reddish brown. — Wings: Humeral plates largely black, yellow spot in anterior corner in Fw larger than in Hw; axillary plates black with very distinct yellow spot, much smaller in Fw than in Hw; intermediary plates black; venation greyish-brown to black, costa of Fw with rather indistinct paler median ray; membrane hyaline; Ax 18-19/14, Px 17-18/16-17; Ax1 and Ax4 thickened in both wings; discoidal triangles made up of 2-3 cells; Pt grey to greyish black, at least four times as long as wide, overlying 3-4 cells; anal loop markedly longer along wing axis than along body axis, 3 cells wide, 2 cells long, made up of 6 cells; anal triangle 3-celled; membranules greyish brown.

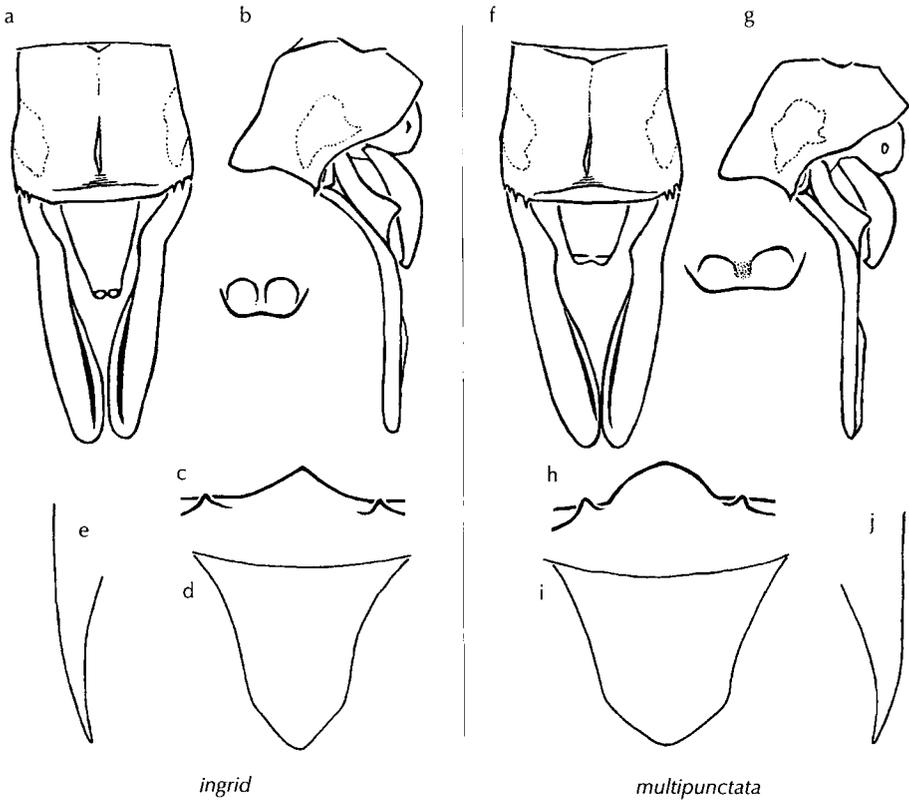


Figure 1: Comparison of *Austroaeschna ingrid* sp. nov. (a-e) and its sister species *A. multipunctata* (f-j) — (a, f) male anal appendages, dorsal, and insert of enlarged tip of appendix inferior, dorsocaudal; (b, g) male anal appendages, lateral; (c, h) female occiput, caudal; (d, i) male exuvia, basal projection of epiproct, dorsal; (e, j) female exuvia, apical portion of paraproct, ventral.

Abdomen: Tergum 1 brown with pair of pale yellow ventrolateral patches; terga 2-9 and S10 black marked with yellow as follows: 2, an anterior and a posterior fine middorsal line, a pair of transverse fine lines, a pair of posterodorsal spots, a pair of antero- and posterolateral spots and of long ventrolateral streaks; 3-8, a pair of narrowly separated antero- and mediodorsal spots, a pair of widely separated posterodorsal spots and antero- and mediolateral spots; tergum 9 and S10 with pair of widely separated posterodorsal patches; mediodorsal spots of tergum 3 may be fused with mediolateral spots; mediodorsal spots of terga 5-7 are subtriangular and appear posterior to supplementary transverse carina only; sterna black. Anal appendages: as seen from dorsal aspect, superiors anal appendages are very slender with slightly less than basal $\frac{1}{3}$ convergent and remaining $\frac{2}{3}$ almost straight, inferior appendage slender and appearing almost half as long as superior anal appendages, its apex very narrow and distinctly bilobed (Fig. 1a); as seen from lateral aspect, all appendages very slender, superiors evenly arched and with strongly developed ventral tooth just before $\frac{1}{3}$ length, inferior appendage only slightly arched (Fig. 1b). **Measurements [mm]:** Total length 62; length of abdomen excl. appendages 44; length of Hw 39.

Description of a paratype female

Head: Much as in male but black in postclypeus more, yellow less extensive; occiput as seen from caudal aspect triangular and obtusely pointed (Fig. 1c), as seen from dorsal aspect with a small tooth each side.

Thorax: Much as in male but: legs with darker areas less, pale areas more extensive; costa of Fw without median ray; Ax 17-18/11-12, Px 15-17/16-17; discoidal triangles made up of 2 cells; Pt pale brownish yellow; anal loop 2-3 cells wide and 2 cells long, made up of 5 cells; no anal triangle.

Abdomen: Coloration much as in male; no auricles; tergum 8 with just an indication of anterodorsal spots, very small anterolateral and mediolateral spots and much larger posterolateral spots; S10 and the very short and obtuse supra-anal plate and anal appendages black; dentigerous plate (with four distinct teeth each side), valves and styli black; terebra reaching to end of S10.

Measurements [mm]: Total length 58; length of abdomen 43.5; length of Hw 42.

Variability

Both sexes: yellow butterfly-shaped median mark of labrum divided or not divided by black midline; narrow curved yellow line in dorsal $\frac{1}{4}$ of mesepimeron broken or unbroken; discoidal triangles made up of 2-4 cells; measurements [mm]: length of Pt 2.5-2.9 in Fw, 2.5-3.1 in Hw.

Male: Ax 16-19/11-14, Px 15-19/14-18; generally Ax1 and Ax4 thickened in both wings, rarely Ax1 and Ax3 or Ax1 and Ax5; anal loop 3-4 cells wide, made up of 6-7 cells; measurements [mm]: total length 59-64; length of abdomen 42-46; length of Hw 39-42.5.

Female: Ax 16-19/11-13, Px 13-17/13-17; anal loop 2-3 cells wide and long, made up of 5 cells; coloration of abdominal terga 4-7 may be paler (brown instead of black); ventral portions of antero- and mediolateral spots of terga 4-7 may be connected; anterodorsal spots on tergum 8 may be more distinct; dentigerous plate with 4-5 distinct teeth each side; measurements [mm]: total length 55-60; length of abdomen 42-46; length of Hw 40.5-42.

Description of the larva (given from final stadium exuviae)

A typical larva of the *A. multipunctata* complex with prementum moderately elongate, eyes not much larger than postocular lobes, pronotal lobes rounded and slightly forward directed, meso- and metathorax without distinct lateral spines, all abdominal terga well arched and ventral edges of epiproct not denticulate but very hairy. Length:greatest width ratio of prementum ca 1.25; ligula with median cleft rather poorly developed and only the outer of the ligula teeth (paraglossae) well developed; labial palps generally with 14-15 teeth including strongly developed end hook. Anterior prothoracic process markedly more slender than posterior process. Abdomen with small, moderately slim lateral spines on S6-9, hardly an indication of a spine on S5; female gonapophyses reaching to middle of S10 or slightly beyond; elements of anal pyramid, particularly paraprocts, long, evenly curved and drawn out into slim tips (Fig. 1e); male projection of epiproct at least twice as long as its width at the subapical kink; base more than twice as wide as its width at subapical kink (Fig. 1d). **Measurements [mm]:** Total length 33.0-36.0; length of metafemur 6.4-6.9; width of head including the eyes 7.4-8.5; greatest width of abdomen 6.8-7.2; length of prementum 5.2-5.6, greatest width 4.2-4.5, width at base 2.4-2.7.

Ecological data

A main habitat of *A. ingrid* appeared to be the headwaters of Rosea Creek, actually kind of a boggy swamp, where several adults were observed. More individuals, however, were observed and collected along the track along this habitat. Mountain-topping there cannot be excluded. Exuviae were found at McKenzie Falls, and adults were collected along the track leading to the base of, and along the creek below, the falls. Exuviae were also collected along Scrubby Creek, a fast flowing rocky stream with rather high, steep and densely vegetated banks. Emergence occurred on logs and on rocks. At McKenzie Falls *A. subapicalis* was found to coexist with *A. ingrid*, which was the only telephlebiid observed at Rosea Creek. At Scrubby Creek *A. ingrid*, *A. parvistigma*, *A. subapicalis* and *Telephlebia brevicauda* were present. *A. parvistigma* and *T. brevicauda* were recorded from the Grampians for the first time.

DISCUSSION

The lack of pale mandibular spots, the tiny postocular lobes (teeth) of the female, the generally reduced median row of cells in the IR2 fork, the reduced number of spines on the fossa genitalis and the completely dark anterior frons identify *Austroaeschna ingrid* as a member of the *A. multipunctata* complex of Peters & Theischinger (2007), which now includes *A. christine* Theischinger, *A. ingrid* sp. nov., *A. multipunctata*, *A. obscura* Theischinger, and *A. sigma* Theischinger (for distributions see Fig. 2). The agreement in the characters previously considered as autapomorphic for *A. multipunctata* (Figs 1f-j), namely the size reduction of the pale ventral abdominal spots in the male and the rather stout larval prementum (Peters & Theischinger 2007), strongly indicate that *A. ingrid* and *A. multipunctata* from Victoria and south-eastern New South Wales are each others sister species. The outstanding length and slenderness of the male appendix inferior (Figs 1a, b) is the prominent autapomorphic character of *A. ingrid*, the strong subbasal mesal angulation of the appen-

dices superiores of the male (Fig. 1f) is now considered the most prominent apomorphic character of *A. multipunctata*. It is quite interesting that structural differences of this magnitude should exist in allopatric species where they appear more or less unnecessary. There may, however, have been geographical contacts or overlaps between *A. ingrid* and *A. multipunctata* over time periods in the past, and it cannot be excluded that such zones still exist and that e.g. *A. ingrid* extends into the montane country near Ararat (Mount Langi Ghiran, Mount Buangor, and the nearby Pyrenees). Coexistence or overlap of *A. ingrid* and *A. multipunctata* there is considered quite possible. There is a zoogeographical parallel case in the plecopteran genus *Trinotoperla* with two widely distributed southeast Australian species, *T. minor* Kimmins and *T. nivata* Kimmins, and a quite different species, *T. sinuosa* Theischinger, known from the Grampians, Mount Buangor, and Mount Langi Ghiran only (Theischinger 1982b). At this stage *A. ingrid* is known from headwaters of McKenzie River (part of the Murray-Darling catchment) and from tributaries of Glenelg River. It appears that the ecological range of the species is not very narrow.

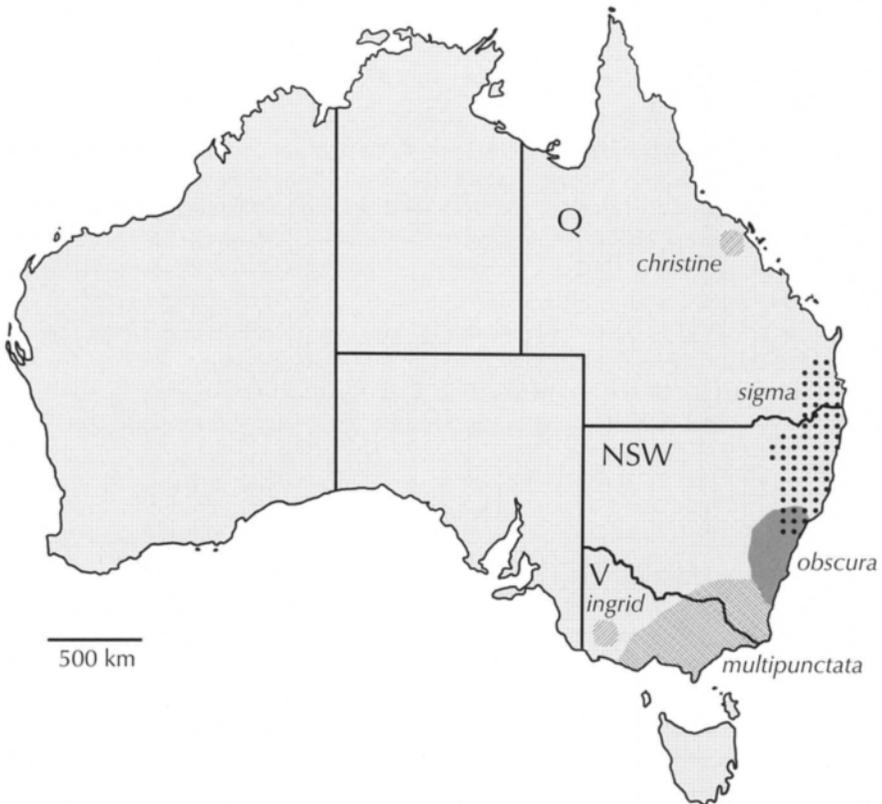


Figure 2: Distribution of the species of the *Austroaeschna multipunctata* complex in the E Australian territories of Queensland (Q), New South Wales (NSW) and Victoria (V).

A. christine from the Eungella area in tropical north-eastern Queensland and *A. sigma* from south-eastern Queensland and generally only north-eastern New South Wales, two species more distantly related to *A. ingrid* and *A. multipunctata*, have a slightly narrower apex of the male appendix inferior than *A. multipunctata* and *A. obscura* from southern New South Wales but as a whole the appendix is also markedly shorter and stouter than that of *A. ingrid*.

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REFERENCES

- Peters, G. & G. Theischinger, 2007. Die gondwanischen Aeshniden Australiens (Odonata: Telephlebiidae und Brachytronidae). *Denisia* 20: 517-574.
- Theischinger, G., 1982a. A revision of the Australian genera *Austroaeschna* Selys and *Noto-aeschna* Tillyard (Odonata: Aeshnidae: Brachytroninae). *Australian Journal of Zoology*, Supplement 87: 1-67.
- Theischinger, G., 1982b. New and little known dinotoperline stoneflies from Australia (Insecta: Plecoptera: Gripopterygidae). *Memoirs of the Queensland Museum* 20: 489-525.
- Theischinger, G., 2002. Preliminary keys for the identification of larvae of the Australian Petaluridae, Archipetaliidae, Austropetaliidae, Telephlebiidae and Aeshnidae (Odonata). Cooperative Research Centre for Freshwater Ecology, Thurgoona.