

**PRELIMINARY GUIDE TO THE IDENTIFICATION
OF ADULT AND LARVAL DYTISCIDAE
AND ADULT AQUATIC HYDROPHILIDAE
(INSECTA : COLEOPTERA)**

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Identification Guide No. 19**

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|--------------|---------------|---------------------------------|-----------------|
| Front cover: | Upper left: | <i>Helochares tristis</i> | (Hydrochidae)* |
| | Upper right: | <i>Berosus majusculus</i> | (Hydrophilidae) |
| Back cover: | Lower left: | <i>Necterosoma regulare</i> | (Dytiscidae) |
| | Lower right: | <i>Sternopriscus maedfooti</i> | (Dytiscidae) |
| | Upper left: | <i>Hydrochus</i> sp. | (Hydrophilidae) |
| | Upper right: | <i>Lancetes lanceolatus</i> | (Dytiscidae) |
| | Middle left: | <i>Rhantus suturalis</i> | (Dytiscidae) |
| | Middle right: | <i>Onychohydrus scutellaris</i> | (Dytiscidae) |
| | Lower left: | <i>Chostonectes gigas</i> | (Dytiscidae) |
| | Lower right: | <i>Onychohydrus scutellaris</i> | (Dytiscidae) |

Photographs by John H. Hawking, MDFRC/CRCFE

*some authors regard Hydrochidae as a subfamily of Hydrophilidae

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I would like to thank Ms J Forest OAM for taking the photomicrographs and, Ms S. Mettner, Ms C. Horne, Ms F. Smith, Ms D. Crowther and J. Hawking for helping in preparing the manuscript.

Family DYTISCIDAE

Part I. ADULTS

INTRODUCTION

The aim of this guide is to enable the identification of Australian Dytiscidae to generic level as easily and quickly as possible. In the key I have not used a strictly systematic approach but have used what, I think, are the easiest characters, be they size, locality or whatever. In doing this the systematic groupings are often shattered. Thus I have traded ease, and I hope accuracy, of identification off against imparting systematic knowledge. To some extent at least this can be recovered from the checklist.

To help go beyond the generic level I have given a reference to the most recent keys to the species in the brief generic accounts. If no reference is given there has been no further revision since my (1978) paper which should be referred to.

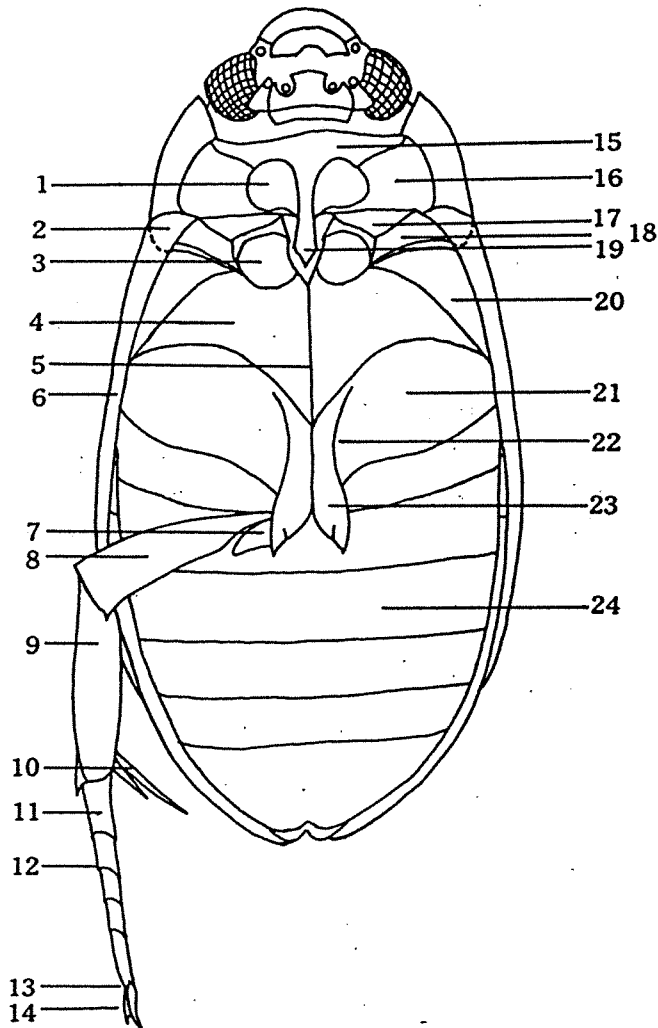
The generic accounts are brief and generalised. They are meant as a guide only. They also include a lot of the rather rough shorthand. Thus 'north' means anything north of say the tropic of Capricorn, 'south' anything south of say Geraldton-Sydney. I am sure there will be many exceptions as knowledge increases, but it is unlikely that a 'northern' genus will turn up in Victoria (the converse is less true since several 'southern' species reappear in the Atherton Tableland region). Still, flowing, running, pond, river, etc are equally vague terms and in most cases refer to the habitat the genus is most often found in based on my perception of that habitat, but adults of most genera are occasionally found in most fresh water habitats. When known I have indicated the season when I have found larvae. Again this is very preliminary and is of very uneven quality. One I am reasonably sure about which surprised me is *Barrethydrus* restricting its breeding to winter when the rivers in its alpine environment are very cold. Cases where I am almost certain I know the larvae but have not yet reared them or associated them with adults I have indicated with a question mark (?).

Finally, I would be grateful if problems with the key or mistakes in the text were pointed out.

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MORPHOLOGY

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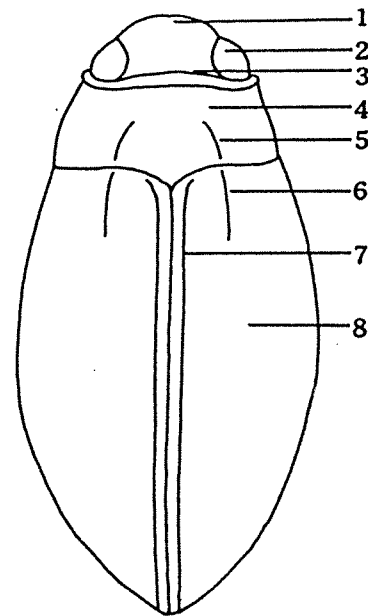
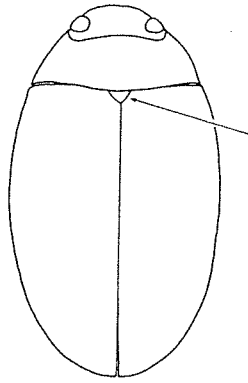


Figure A. Diagram of underside of adult dytiscid. 1, Procoxal cavity. 2, Epipleural pit (if present). 3, Mesocoxal cavity. 4, Metasternum. 5, Midline of metasternum. 6, Elytral epipleuron. 7, Metatrochanter. 8, Metafemur. 9, Metatibia. 10, Metatibial spines. 11, Basal segment of metatarsus. 12, Notch on posterior edge of segments of metatarsus. 13, Uniguclar cleft (if present). 14, Metatarsal claws. 15, Prosternum. 16, Empimeron of prosternum. 17, Mesoepisternum. 18, Mesoepimeron. 19, Prosternal process. 20, Metepisternum. 21, Metacoxal plate. 22, Metacoxal line. 23, Metacoxal process. 24, Abdominal sterite (3rd visible; 4th structural).

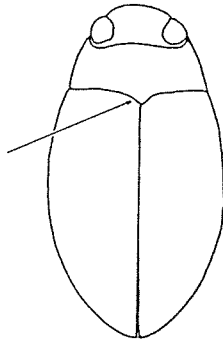
Figure B. Diagram of upper surface of a bidessine dytiscid. 1, Clypeus. 2, Eye. 3, Cervical stria. 4, Pronotum. 5, Pronotal stria. 6, Elytral stria. 7, Sutural stria on elytron. 8, Elytron. The striae may not be present on all specimens.

KEY TO AUSTRALIAN GENERA OF DYTISCIDAE.

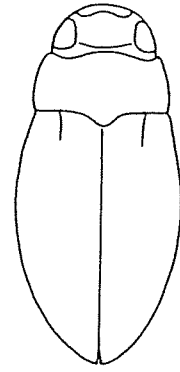
- 1 Scutellum visible, length > 5mm (Fig. 1)..... 25
- 1 Scutellum invisible, length < 8mm (Fig. 2)..... 2
- 2 Small (1mm), eyeless, terrestrial, mountain tops of North Queensland.....*Terradessus*
- 2 Not as above 3
- 3 Each elytron with two or more longitudinal grooves (Figs. 5 & 6) 4
- 3 Elytra without grooves except for short elytral plicae in some (Fig. 3 & 4)..... 5
- 4 Base of pronotum constricted, each elytron with two grooves (Fig. 5)..... *Carabhydrus*
- 4 Base of pronotum not constricted, each elytron with four to five grooves (Fig. 6)
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- 5 Two pronotal grooves usually continued onto elytra (Fig. 4) 6
- 5 No grooves on either pronotum or elytra..... 13
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- 6 Not as above 7
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- 7 Without such a cervical stria 10
- 8 Front edge of head narrowly flanged, epipleuron with basal cavity (Fig. 8).....
..... *Clypeodytes*
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- 10 Each elytron with a stria just inward from inner edge (Fig. 13).....*Hydroglyphus*
- 10 Elytron without such a sutural stria 11



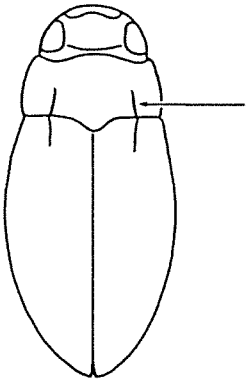
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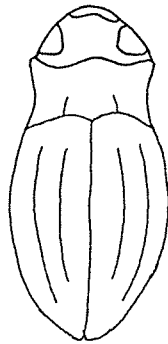
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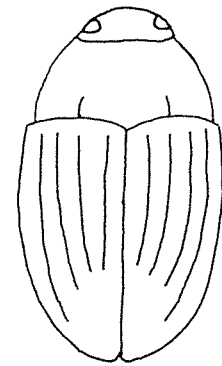
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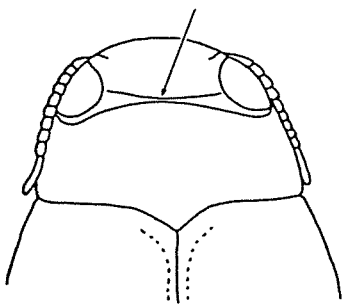
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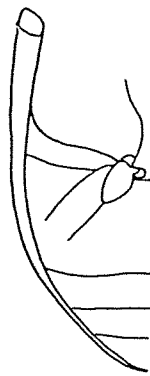
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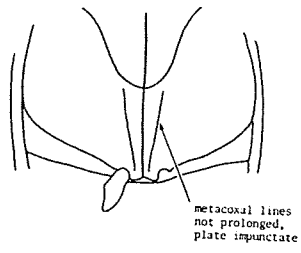


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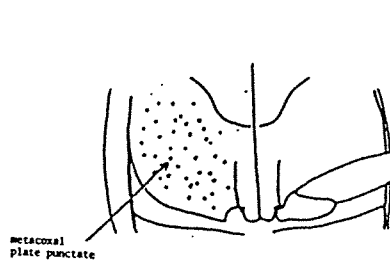


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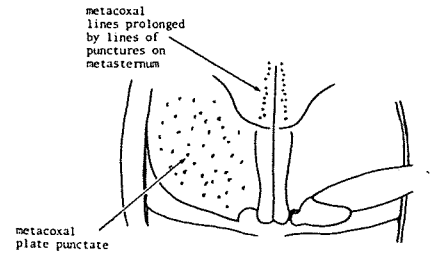
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|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
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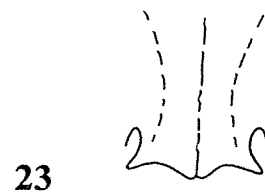
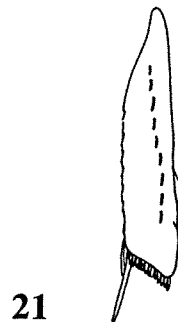
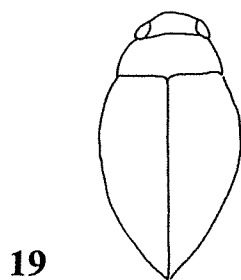
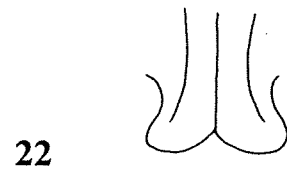
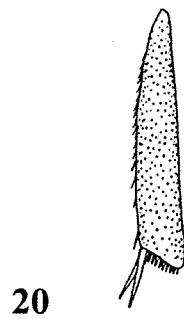
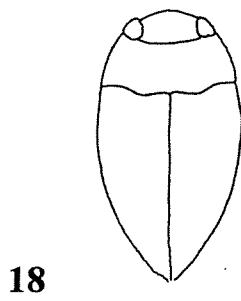
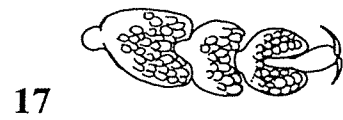
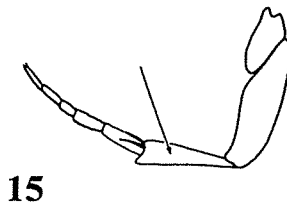
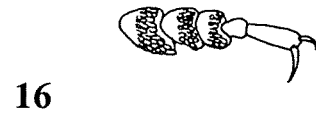
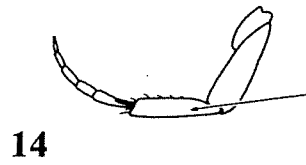
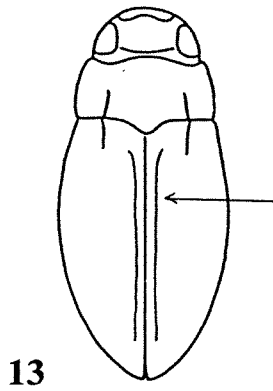
10 Liodessus



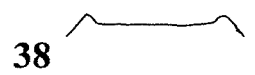
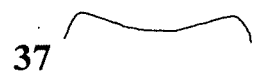
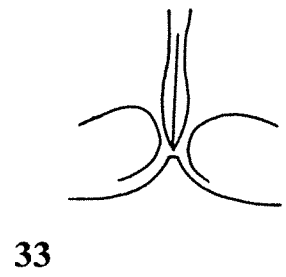
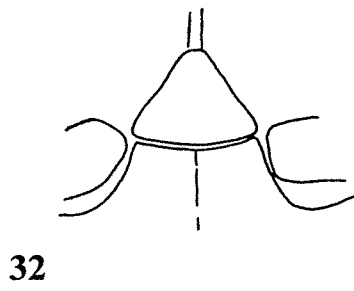
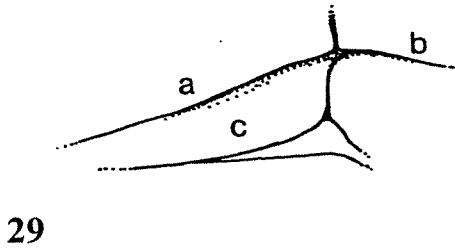
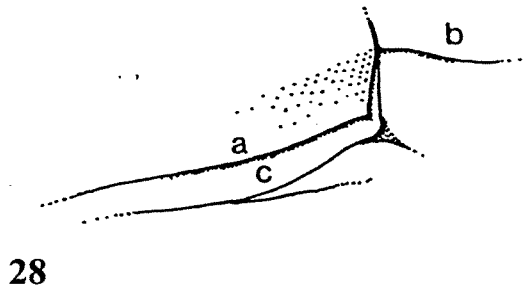
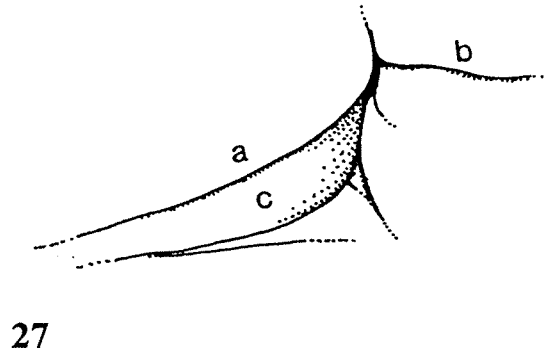
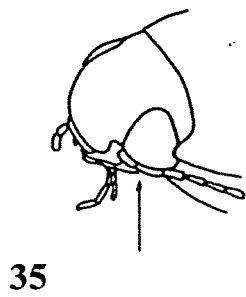
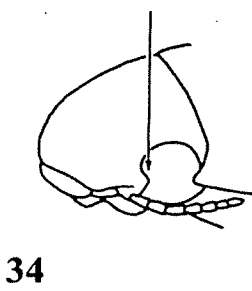
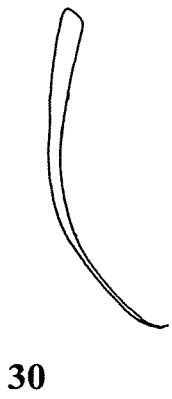
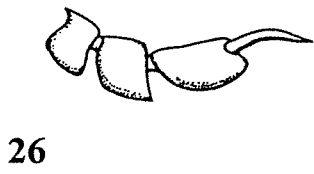
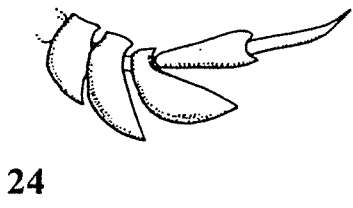
11 Gibbidessus



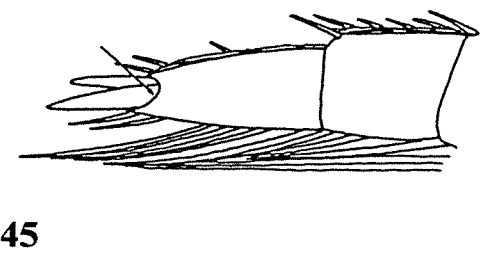
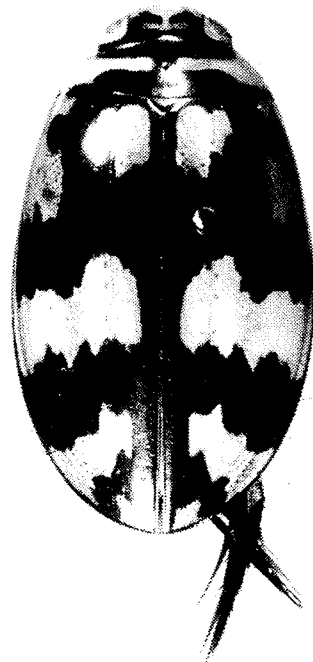
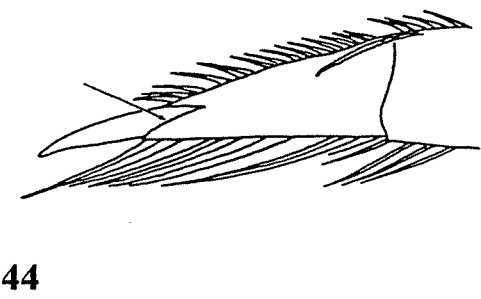
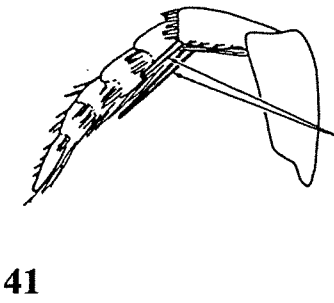
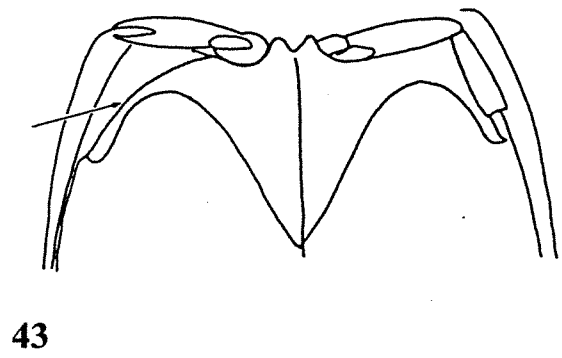
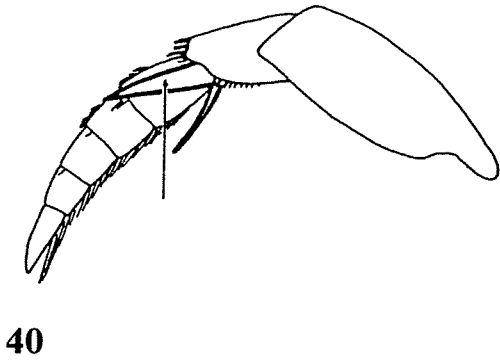
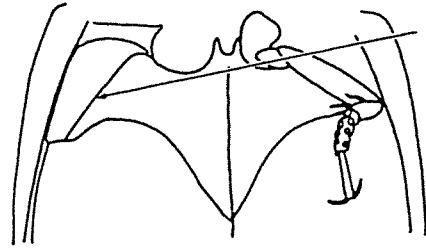
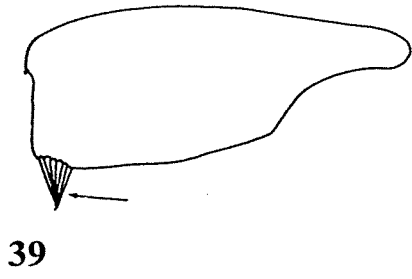
12 Allodessus



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| 21 | Elytral epipleura gradually narrowing (Fig. 30)..... | 22 |
| 21 | Elytral epipleura narrowing abruptly and becoming very narrow in hind half of elytra (Fig. 31)..... | 23 |
| 22 | 5-7mm long | <i>Megaporus</i> |
| 22 | 2.6-6.0mm long. If > 5mm then pronotum black with narrow yellow margins contrasting with yellow markings at base of elytra (<i>C. gigas</i>) (Some <i>C. gigas</i> lack markings at base of elytra)..... | <i>Chostonectes</i> |
| 23 | Elongate, pronotum and elytra covered with fine silky, setae, usually with well marked yellowish colour pattern on elytra | <i>Bidessodes</i> (in part) |
| 23 | Dorsal surface with few setae, if with colour pattern small (<2 mm) and round | 24 |
| 24 | Usually round and deep bodied, prothoracic process ending in very broad, flat, triangular 'plate' (Fig. 32)..... | <i>Hydrovatus</i> |
| 24 | Elongate oval, prothoracic process narrow, carinate, sharply pointed (Fig. 33). Southern..... | <i>Paroster</i> |
| 25 | Front of eye partly covered by backward extension of side of head (Fig. 34) | 26 |
| 25 | Front of eye not so covered (Fig. 35) | 31 |
| 26 | Brownish beetle, elytra with light and dark stripes, 10-12mm (Colour photograph, back cover - upper right). Southern..... | <i>Lancetes</i> |
| 26 | Elytra usually not striped, if striped smaller and predominately black | 27 |
| 27 | 12-14mm, brownish, pronotum red brown with central dark spot | <i>Rhantus</i> |
| 27 | < 11mm. black, or black with some yellowish spots and stripes | 28 |
| 28 | Prosternal process carinate or rounded in cross-section (Fig. 36)..... | 29 |
| 28 | Prosternal process grooved in cross-section (Fig. 37)..... | 30 |
| 29 | A group of stout setae on outer angle of hind femur (Fig. 39). Never have elytra with sharp longitudinal striae or with areas of short deep striae | <i>Platynectes</i> |
| 29 | Lacking such setae. May have sharply incised longitudinal striae or areas of dense fine striae on elytra | <i>Copelatus</i> |
| 30 | Elytra with dense minute punctures | <i>Batrachomatus</i> |
| 30 | Elytra with a fine reticulation, without punctures | <i>Allomatus</i> |



| | | |
|----|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| 31 | Yellowish, elytra strongly and evenly punctured in strong contrast to minute punctures on pronotum..... | <i>Eretes</i> |
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| 34 | Prosternal process flat, < 15mm | 35 |
| 35 | Outer margin of metasternal wing straight (Fig. 42)..... | <i>Hydaticus</i> |
| 35 | Outer margin of metasternal wing curved (Fig. 43) | 36 |
| 36 | > 14mm long (Fig. 46, this is one of two colour forms) | <i>Sandracottus</i> |
| 36 | < 10mm long | <i>Rhantaticus</i> |
| 37 | > 20mm long | 38 |
| 37 | < 20mm long | 39 |
| 38 | Ventral surface red/yellow. Southern | <i>Onychohydrus scutellaris</i> |
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| 40 | Hind leg with one claw (Fig. 44), hind coxal lines present but not well developed, lateral band of yellow > width of eye. Coastal NT..... | undescribed Genus |
| 40 | Hind leg with two claws (Fig. 45), lacking coxal lines, lateral band of yellow < width of eye | <i>Onychohydrus atratus</i> |



NOTES ON GENERA (in alphabetical order)

Allodessus Guignot

Small (2.9-3.5mm), oval, grey-yellow. Very common and wide spread, more common in inland areas than wet coastal, in still water. One described species, *A. bistrigatus*, and possibly one undescribed (Larson 1993). Larvae known; spring and summer. Endemic

Allomatus Mouchamps

Medium sized (8.5-10.0mm), elongate, streamlined, black. Found along banks of small to large rivers. Rare, although can be locally abundant. Two described species *A. nannup* in the southwest, *A. wilsoni* in the south-east. Larson (1993) records a third species from north Queensland. Larvae unknown. Endemic.

Antiporus Sharp

Small (3.5-6.8mm), oval, reddish-yellow to black species. One species, *A. gilberti*, with distinct dark lines on elytra. Males of all but one species with expansions to the hind tibiae. Common, generally in still water. Eleven species. Larvae known; spring. Endemic to Australia and New Zealand. Watts (1997b).

Austrodytes Watts

Large (17-19mm), oval, wider behind middle, greenish-black with narrow yellow border. Found in small streams in the north. One species, *A. insularis*. Larvae unknown. Endemic.

Australphilus Watts

Small (2.3-3.0mm), shiny, streamlined, narrowing toward rear with strong yellow/dark pattern on top surface. Relatively rare, found in running water, occurs in south-eastern Australia and Tasmania. Two species. Larvae ? known; late summer. Endemic

Barrethydrus Lea

Small (4.0-4.8mm), black with well marked reddish spots on elytra, elytra grooved. Found in mountain streams in south-eastern Australia as far north as the New England region. Often abundant in local area. Three species. Larvae ? known; winter. Endemic.

Batrachomatus Clark

Medium sized (8.5-10.0mm), elongate oval, shiny, black. Elytron often with reddish basal spots or lateral pale stripe. Still to running water. Two species, one, *B. wingi*, has a distinctive yellow stripe on side of elytron and is restricted to the north, the other, *B. daemeli*, found in eastern Australia from north Queensland to Victoria, lacks these stripes. Larvae ? known. Endemic.

Bidessodes Regimbart

Small (2.3-4.2mm), elongate, oval. Found in still water and small streams in wetter areas of northern and eastern Australia as far south as Victoria. Relatively common. Five described species and possibly an undescribed one. Larvae unknown.

Boongarrus Larson

Very small (1.8-2.2mm), elongate, flattened, parallel sided. Found amongst gravel in shallow headwaters of streams in the Atherton tableland. Rare. One species, *B. rivulus*. Larvae unknown. Endemic. Larson, 1994.

Carabhydrus Watts

Small (2.0-3.5mm), with distinctly wasted look at junction of pronotum and elytra and grooved elytra. Found sparingly in fast running mountain streams in eastern Australia and Tasmania. Five described and several undescribed species. Larvae ? known; spring. Endemic. Larson & Storey, 1994.

Chostonectes Sharp

Small to medium sized (3.8-6.5mm), round, deep bodied, strongly punctured, with colour pattern on elytra. Common in south, rare in north where restricted to central Australia and Atherton tableland. Still to fast running water. Specimens from fast streams in alpine areas tend to be more strongly coloured than those from lowland regions. Five species. Larvae known; spring in south, wet season in north. Endemic. Wewalka (1994).

Clypeodytes Regimbart

Small (1.2-2.7mm), round, often with colour pattern on elytra. Found in still water in northern Australia as far south as northern New South Wales. Often common. Larvae unknown. Three described species and several undescribed ones. Larson, 1994.

Copelatus Erichson

Medium sized (4.0-10.0mm), elongate oval or even parallel sided, black to reddish occasionally with weak dorsal colour pattern, often with long striae, or numerous short striae on elytra. Common over whole of Australia in ponds and streams. Twenty described species and at least one undescribed. Larvae known; spring in south, wet in north.

Cybister Curtis

Large to very large (22-34mm), oval, widening behind middle, greenish to black with narrow yellow border. Still waters in centre and north. One species, *C. tripunctatus*, is common and widespread and is only species from outside coastal north south to Townsville. Four species. Larvae known; wet season.

Eretes Castelnau

Medium sized (12.5-16.0mm), broadly oval, slightly triangular, rather flat, yellowish. Often extremely abundant in still, temporary water in arid areas, absent or very rare from wet coastal areas. One species, *E. australis*. Larvae known; summer in south, opportunistic inland and north.

Gibbidessus Watts

Small (1.8-2.1mm), oval. Restricted to south-eastern Australia. Rare. Found in ponds or slow moving streams in open country. One species, *G. chipi*. Larvae unknown. Endemic.

Hydaticus Leach

Medium sized (9.0-16.0mm), oval, often with colour pattern on elytra. Found in still and slow water in north, one species as far south as New South Wales/Victorian border. Common. Eleven species. Larvae ? known; wet season. Daussin, 1980.

Hyderodes Hope

Large (18.0-21.0mm), oval, deep bodied, black. Found in still temporary water in south. Two species, *H. schuckhardi* in southeast and *H. crassus* in the southwest. Larvae known; spring. Endemic.

Hydroglyphus Motschulsky

Small (2.0-4.0mm), elongate oval, often with colour pattern on elytra. Found predominately in still water. Common throughout Australia. Nine described and some undescribed species. Larvae known; wet season in north, unknown in south. Previously known as *Guignotus* Houlbelt. Bistrom, 1988.

Hydrovatus Motschulsky

Small (2.0-4.0mm), broadly oval, deep bodied, reddish to black, lacking colour pattern on elytra. Found in still water. Very common in north, much rarer in south. Seven species. Larvae ? known. Main breeding season unknown.

Hyphydrus Illiger

Small (4.0-5.0mm), oval, deep bodied, often with well marked black/yellow pattern on elytra. Common in still to moderately flowing water over much of Australia, more abundant in north. Five species. Larvae known; spring/summer. Bistrom, 1982.

Laccophilus Leach

Small (3.0-4.5mm), shiny, streamlined narrowing towards rear end, often with clear colour pattern on elytra. Very common in north, coming as far south as northern South Australia and central New South Wales in still to moderately running water. Nine species. Larvae known; one of first to start breeding in wet season. Brancucci, 1983.

Limbodessus Guignot

Small (2.2-2.6mm), narrowly oval, endemic. Wide spread and relatively common in still water in wetter areas of north and eastern Australia. One species, *L. compactus*. Larvae ? known; spring (in south).

Liodesus Guignot

Small (2.0-3.1mm), oval, elongate. Found predominately in still water. Common throughout Australia. Six described species and possibly some undescribed. Larvae known; spring and summer.

Lancetes Sharp

Medium sized (10.5-12.0mm), elongate. Readily recognised by its size and the dark lines on elytra. Common. Widespread in small creeks and ponds in southern Australia but seemingly in relatively low density in any one locality. One species, *L. lanceolatus*. Larvae known; winter/spring. (Colour photograph of *Lancetes lanceolatus*, back cover - upper right).

Megaporus Brinck

Medium sized (5.8-7.2mm), oval, reddish or sometimes with yellow and black colour pattern on elytra. Widespread and common in still to slowly running water. Eight species. Larvae known; spring in south, wet season in north. Endemic.

Necterosoma Sharp

Small (4.0-5.2mm), oval, with distinct colour pattern on elytra, raised elytral carinae in two species. Males have front tibiae notched, often strongly. Very common and widespread in still to running water. Eight species. Larvae known; spring/summer. Endemic. Zwick, 1984. (Colour photograph of *Necterosoma regulare*, front cover - lower left).

Onychohydrus Schaum & White

Medium to large (16-28mm), oval, dorsal surface greenish-black narrowly yellow at sides. Relatively rare in still water. Two species, the smaller, *O. attratus* in the north and larger, *O. scutellaris*, in south; late spring in south, wet in north. Larvae known. Previously known as *Homeoedytes* Régimbart. Nilsson *et al*, 1989. (Colour photograph of *Onychohydrus scutellaris*, back cover - middle right).

Paroster Sharp

Small (2.5-4.5mm), elongate, oval, dorsal surface quite strongly reticulate and evenly punctured. Southern, relatively common in the southwest, rare in the southeast. In shallow, temporary, pools and small creeks, in winter and spring. Seven species. Larvae known; winter and early spring. Endemic.

Platynectes Sharp

Medium sized (5.8-7.2mm), oval, rather flat, shiny black usually with a few yellowish spots at side of elytra. Found in running water throughout Australia. Common. Twelve described species but taxonomy poor and probably several undescribed species present. Larvae known; spring in south, wet season in north. Gueorguiev, 1972.

Rhantus Lacordaire

Medium sized (11.5-14.0mm), brownish. Found in ponds and slow creeks, even backyard swimming pools. Two species, one, *R. suturalis*, is very common throughout Australia (and outside Australia as far as Europe) the other, *R. simulans*, is known only from a couple of specimens collected in the southwest. Larvae known; throughout the year in south, wet

season in north. Balke, 1993. (Colour photograph of *Rhantus suturalis*, back cover - middle left).

Sekaliporus Watts

Small (3-4mm), oval, black with reddish/yellow spots on elytra. Rare. Known only from coastal Northern Territory. Habitat unknown. One species, *S. kriegi*. Larvae unknown. Endemic. Watts, 1997a.

Sternopriscus Sharp

Small (2.2-4.8mm), elongate, rather hump-backed, usually with colour pattern on elytra. The males of many species have antennae with greatly and oddly enlarged segments. Common and widespread, particularly in south in still to fast running water. Fourteen described species and several undescribed. Larvae known; spring-summer. Endemic. (Colour photograph of *Sternopriscus maedfooti*, front cover - lower right)

Spencerhydrus Sharp

Large (15.5-18mm), oval, widening behind, greenish with rather wide yellow border. Found in still temporary water in south. Two species, *S. pulchellus* in southwest, *S. latecinctus* in southeast. Larvae ? known; early spring. Endemic.

Terradessus Watts

Minute, flatish, eyeless. Found in moist litter in mountain forests of north Queensland. Two species. Larvae unknown. Endemic. Brancucci & Monteith, 1997.

Tiporus Watts (replacement name for *Hypodes* Watts)

Small (3.8-5mm) oval, often rather chunky, a few species with colour pattern on elytra. Found in ponds and streams in the north. The males have a three jointed front tarsi which is unique in Australian Dytiscidae. Eight described species and several undescribed. Larvae? known; wet season. Endemic. Watts, 1985.

Undescribed genus

Large (17mm), oval, widening behind, greenish with broad yellow border. This distinctive genus is known from one female from Kakadu National Park collected from still water in 1983. Larvae unknown. Endemic. (Specimen in SA Museum).

Uvarus Guignot

Very small (1.8-2.2mm), broadly oval. Restricted to the southwest. Rare. Probably a still water species. One species, *U. pictipes*. Larvae unknown.

CHECK LIST OF AUSTRALIAN DYTISCIDAE

Subfamily Laccophilinae

Laccophilus Leach

L. cingulatus Sharp

L. clarki Sharp

L. quadrimaculatus Sharp
Browne

L. religatus Sharp

L. seminiger Fauvel

L. sharpi Regimbart

L. transversalis Regimbart

L. univittatus Regimbart

L. walkeri J. Balfour-

Australphilus Watts

A. saltus Watts

A. montanus Watts

Subfamily Hydroporinae

Tribe Hydrovatini Sharp

Hydrovatus Motschoulsky

H. armstrongi Watts

H. fasciatus Sharp

H. nigrita Sharp

H. opacus Sharp

H. ovalis Sharp

H. parallelus Sharp

H. rufoniger (Clark)

Tribe Hyphyrini

Hyphyrus Illiger

H. contiguus Wehncke

H. decemmaculatus Wehncke

H. effeminatus Watts

H. elegans (Montrouzier)

H. lyratus Swartz

Tribe Carabhydrini Watts (status uncertain. Larson & Storey, 1994)

Carabhydrus Watts

C. andreas Zwick

C. monteithi Watts

C. mubboonus Larson & Storey

C. niger Watts

C. plicatus Watts

Tribe Bidessini Sharp

Bidessodes Regimbart

B. biliti Watts

B. denticulatus (Sharp)

B. flavosignatus (Zimmerman)

B. grossus (Zimmerman)

B. mjobergi (Zimmerman)

Uvarus Guignot

U. pictipes (Lea)

Clypeodytes Regimbart

C. bifasciatus (Zimmerman)

C. darlingtoni Watts

C. migrator (Sharp)

Hydroglyphus Motschulsky

H. basalis (MacLeay)

H. deameli (Sharp)

H. godeffroyi (Sharp)

H. grammopterus (Zimmerman)

H. leai (Guignot)

H. mastersi (Macleay)

H. orthogrammus (Sharp)

H. signatus (Sharp)

H. trifasciatus (Watts)

Limbodessus Guignot

L. compactus (Clark)

Allodessus Guignot

A. bistrigatus (Clark)

Liodes

L. amabilis (Clark)

L. dispar (Sharp)
(Clark)

L. gemellus (Clark)

L. inornatus (Sharp)

L. praelargus (Lea)

L. schuckhardi

Gibbidessus Watts

G. chipi Watts

Boongarrus Larson

B. rivulus Larson

Terradessus Watts (systematic position uncertain, Brancucci & Monteith, 1996)

T. anophthalmus Brancucci & Monteith

T. caecus Watts

Tribe Hydroporini

Paroster Sharp

P. couragei Watts

P. gibbi Watts

P. insculptis (Clark)

P. michaelseni Regimbart

P. niger Watts

P. nigroadumbratus (Clark)

P. pallescens Sharp

P. sharpi Watts

Chostonectes Sharp

C. gigas (Boheman)

C. johnsoni (Clark)

C. nebulosus (Macleay)

C. sharpi Sharp

Antiporus Sharp

A. bakewelli (Clark)

A. blakei (Clark)

A. femoralis (Boheman)

A. gilberti (Clark)

A. hollingsworthi Watts

A. jenniferae Watts

A. pembertoni Watts

A. simplex Watts

A. willyamsi Watts

A. wilsoni Watts

A. interrogationis (Clark)

Tiporus Watts

T. alastairi (Watts)

T. centralis (Watts)

T. collaris (Hope)

T. denticulatus (Watts)

T. giuliani (Watts)

T. josepheni (Watts)

T. tambreyi (Watts)

T. undecimaculatus (Clark)

Sekaliporus Watts

S. kriegi Watts

Sternopriscus Sharp

S. browni Sharp

S. cervus Watts

S. hansardi (Clark)

S. maedfooti (Clark)

S. marginatus Watts

S. montanus Watts

S. minimus Lea

S. multimaculatus (Sharp)

S. mundanus Watts

S. obscurus Sharp

S. signatus Sharp

S. tasmanicus Sharp

S. tarsalis Sharp

S. wehnckei Sharp

Barretthydrus Lea

B. geminatus Lea

B. stepheni Watts

B. tibialis Lea

Necterosoma Sharp

N. aphrodite Watts

N. penicillatum (Clark)

N. susanna Zwick

N. darwini (Babington)

N. regulare Sharp

N. undecimlineatus (Babington)

N. dispar (Germar)

N. schmelzi Sharp

N. wollastoni (Clark)

Megaporus Brinck

M. gardeneri (Clark)

M. ruficeps (Sharp)

M. solidus (Sharp)

*M. hammatu*s (Clark)

M. nativigi Mouchamps

M. fischeri

Mouchamps

M. howitti (Clark)

M. wilsoni Mouchamps

Subfamily Colymbetinae

Tribe Agabini Sharp

Platynectes Sharp

P. aenescens (Sharp)

P. darlingtoni Gueorguieu

P. monostigma (Hope)

P. australicus Gueorguieu

P. decempunctatus (Fabricius)

P. octodecimmaculatus (Maclea)

P. bakewell (Clark)

P. lauriana Watts

P. reticulosus (Clark)

P. brownei Gueorguieu

P. magellanicus (Babington)

P. tasmaniae (Clark)

Tribe Colymbetini Regimbart

Rhantus Lacordaire

R. simulans Regimbart

R. suturalis (W. S. MacLeay)

Lancetes Sharp

L. lanceolatus (Clark)

Allomatus Mouchamps

A. wilsoni Mouchamps

A. nannup Watts

Batrachomatus Clark

B. daemeli (Sharp)

B. wingi Clark

Tribe Copelatini Regimbart

Copelatus Erichson

C. ater Sharp

C. divisus J. Balfour-Browne

C. marginatus Sharp

C. australiae Clark

C. elongatulus MacLeay

C. melanarius Sharp

C. australis (Clark)

C. ferrugineus Sharp

C. nigrolineatus Sharp

C. bakewelli J. Balfour-Browne

C. gapa Watts

C. punctipennis Lea

C. boulevardi Watts

C. glyptus Guignot

C. rasilis Lea

C. clarki Sharp

C. gracilis Sharp

C. simplex Clark

C. daemeli Sharp

C. irregularis MacLeay

C. tenebrosus Regimbart

Subfamily Dytiscinae Sharp

Tribe Dytiscini Sharp

Hyderodes Hope

H. crassus Sharp

H. schuckardi Hope

Tribe Eretini Crotch

Eretes Castelnau

E. australis (Erichson)

Tribe Hydaticini Sharp

Hydaticus Leach

H. bihamatus Aubé

H. consanguineus Aubé

H. daemeli Sharp

H. fabrici W. S. Macleay

H. finus Watts

H. microdaemeli Watts

H. parallelus Clark

H. pulcher Clark

H. variegatus Watts

H. vittatus (Fabricius)

H. watti Daussin

Tribe Thermonectini Sharp

Sandrocottus Sharp

S. bakewelli (Clark)

Rhantaticus Sharp

R. congestus (Klug)

Tribe Cybistrini Sharp

Spencerhydrus Sharp

S. latecinctus Sharp

S. pulchellus Sharp

Onychohyrus Schaum & White

O. atratus (Fabricius)

O. scutellaris (Germar)

Austrodytes Watts

A. insularis (Hope)

Cybister Curtis

C. godeffroyi Wehncke

C. loxidiscus Wilke

C. tripunctatus (Olivier)

C. yulensis Guignot

Family DYTISCIDAE

Part II LARVAE

INTRODUCTION

At the generic level larval Dytiscidae in Australia are well defined and relatively easily identified but our knowledge of them at the species level is still a too little for more than a few to be identified to species. Outside of the Bidessini, all but four genera are now known (*Austradytes*, *Allomatus*, *Sekaliporus* and *Sandracottus*). In contrast, within the Bidessini the larvae of only a few are known and our knowledge of them is as yet too poor to delineate genera at this stage.

Dytiscidae have three larval instars which take place in water (other than, presumably, the terrestrial Bidessini *Terradessus*) followed by pupation in damp earthen cells on land. As far as I am aware no work on their lifecycle has been done on Australian species. From my limited observations and from breeding them in the laboratory, the larval stage takes about a month and the pupal stage about a week in spring and summer. Some genera, eg *Barrethydrus* are winter breeders and must take longer. Others may well aestivate over summer. Most seem to have a relatively well defined breeding season of two to three months, most frequently in late winter and spring in the south and during the wet season in the north.

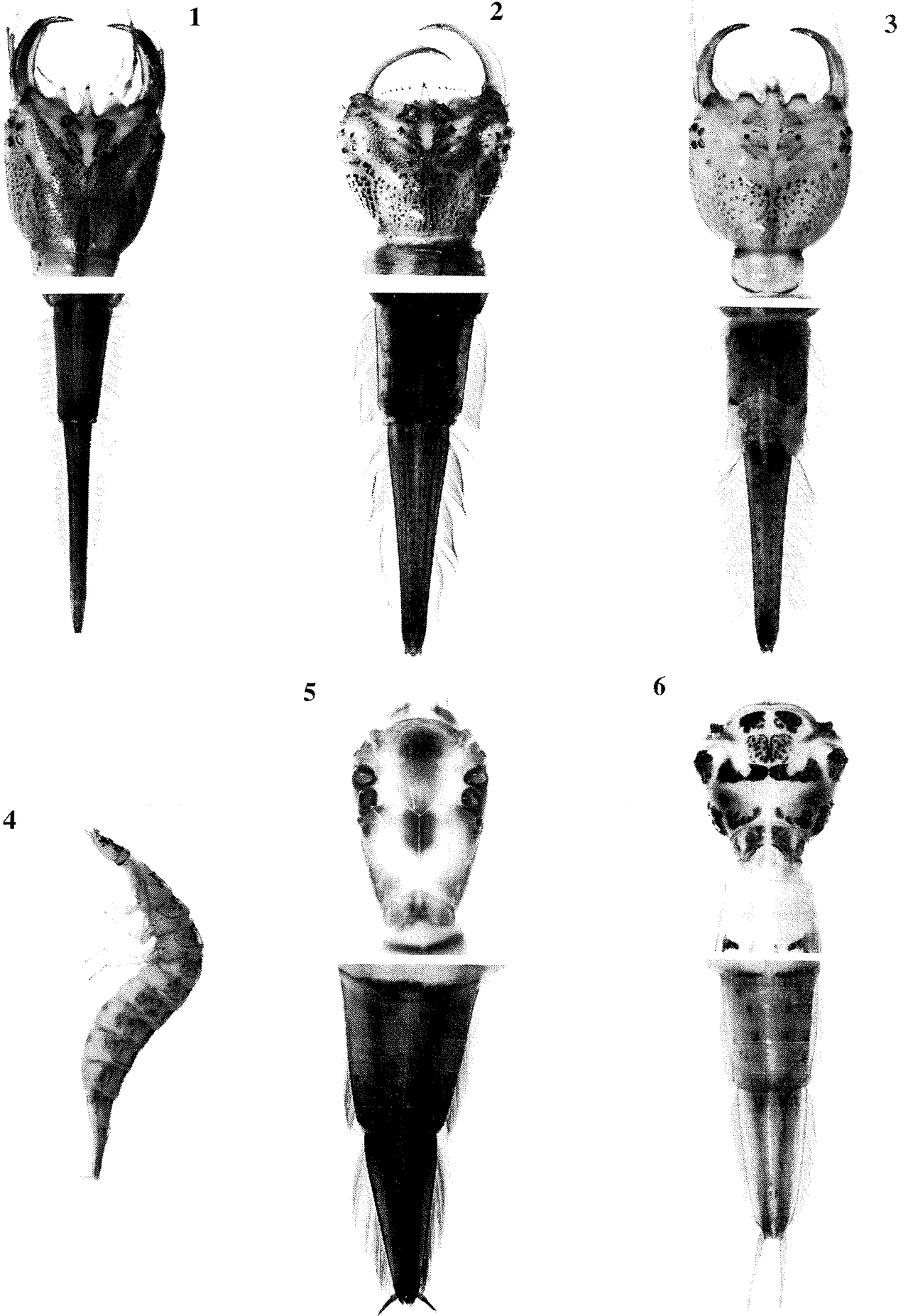
Characters used in the key are, I think, self evident. All are clearly visible in spirit preserved specimens of all three instars.

Not all the genera have yet been bred or associated with an adult biochemically. Those that have not are starred (★). These have been identified by association with adults and by elimination of possibilities. I would be most surprised if any turned out to be wrongly attributed!

All the specimens used in this study are from the South Australian Museum collection.

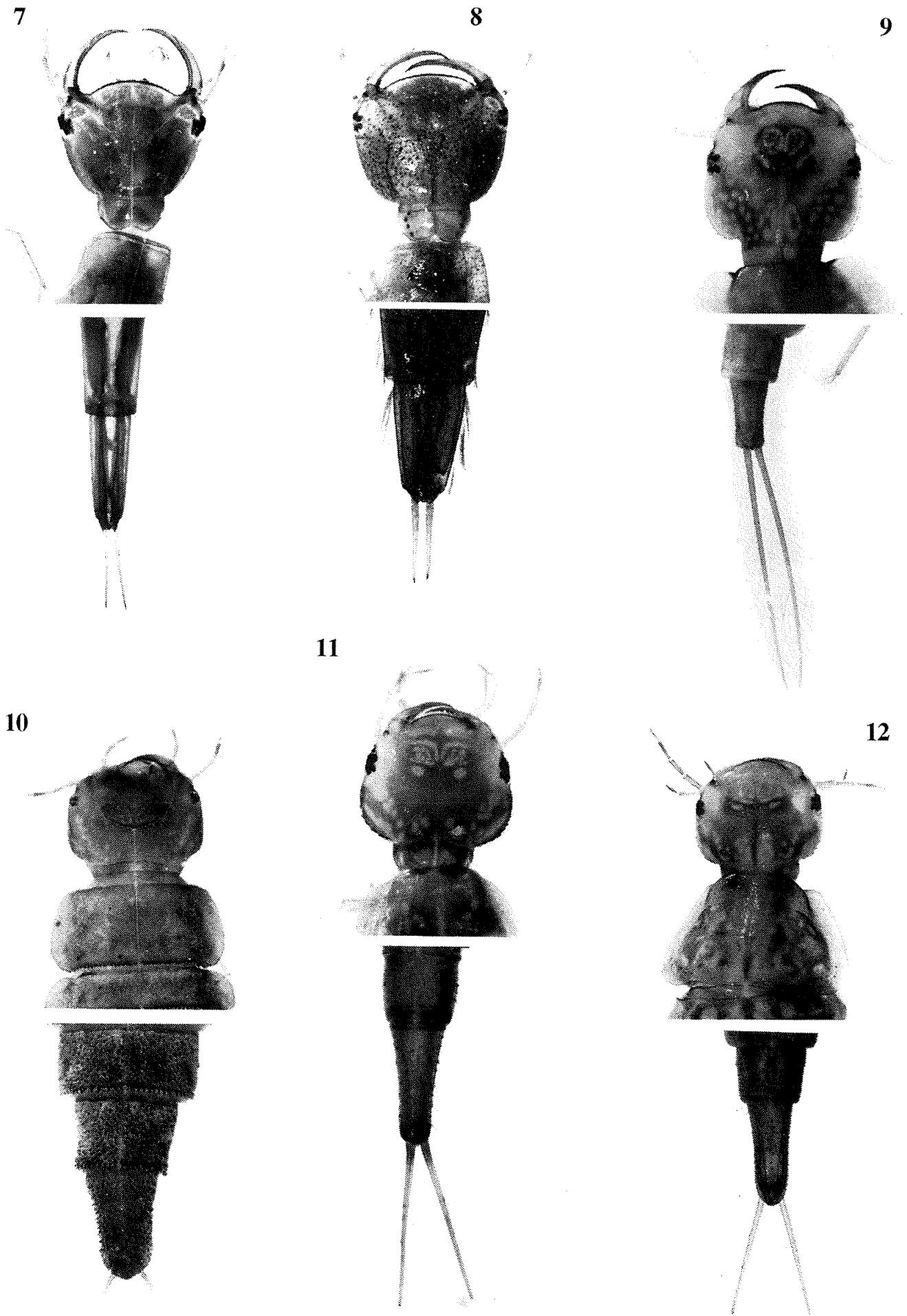
PRELIMINARY KEY TO LARVAE OF AUSTRALIAN DYTISCIDAE GENERA
(other than *Allomatus*, *Austradytes*, *Sandracottus*, *Sekaliporis* and *Bidessini*)

| | | |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 1 | Head without frontal projection (Fig. 1), 2mm-80mm long | 2 |
| 1 | Head with frontal projection (Fig. 16) < 12mm long | 14 |
| 2 | Last two abdominal segments with dense fringe of long setae (swimming-hairs) (Figs 1-8)..... | 3 |
| 2 | Last two abdominal segments without swimming-hairs (Figs 9-15)..... | 8 |
| 3 | Cerci on last abdominal segment vestigial (Figs 1-3)..... | 4 |
| 3 | Last abdominal segment with cerci (Figs 5-15)..... | 5 |
| 4 | <i>Onychohydrus</i> , <i>Spencerhydrus</i> and <i>Cybister</i> separated on shape of front edge of head (see Figs 1,2,3, Colour photograph, back cover - lower right) | |
| 5 | Body jack-knifed in middle (Fig. 4.) | 6 |
| 5 | Body normally shaped. | 7 |
| 6 | Very elongate head, front two ocelli very large (Fig. 5)..... | <i>Rhantaticus</i> |
| 6 | Less elongate head, front two ocelli not much larger than hind two (Fig. 6) | <i>Eretes</i> * |
| 7 | Cerci without swimming-hairs (Fig. 7)..... | <i>Hydaticus</i> |
| 7 | Cerci with swimming-hairs (Fig. 8)..... | <i>Hyderodes</i> |
| 8 | Tip of last abdominal segment elongated into short siphon, reaching well beyond bases of cerci, < 6mm long (Figs 14,15) | 13 |
| 8 | Tip of last abdominal segment truncated reaching not far past bases of cerci, up to 20mm long (Figs 9-13) | 9 |
| 9 | Cerci > twice length of last abdominal segment, with numerous setae (Fig. 9)..... | <i>Lancetes</i> |
| 9 | Cerci < twice length of last abdominal segment with only a few sparse setae (Figs 10-13) | 10 |



Figs: 1, 2, 5-6 Head and last two abdominal segments of: 1, *Cybister tripunctatus*; 2, *Onychohydrus scutellaris*; 3, *Spencerhydrus pulchellus*. Fig 4. Side view of *Eretes australis*. 5, *Eretes australis*; 6, *Rhantaticus congestus*.

| | | |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| 10 | Cerci about half length of last abdominal segment, which is relatively broad. (Fig. 10) | <i>Copelatus</i> |
| 10 | Cerci about length of last abdominal segment which is relatively narrow (Figs 11-13). | 11 |
| 11 | Body with pale spots (Figs 11,12), cerci arise from beneath last abdominal segment (Figs 11,12)..... | 12 |
| 11 | Body yellowish often with numerous small black spots (Fig. 13), without pale spots, cerci arise from end of last abdominal segment (Fig. 13)..... | <i>Batracomatus*</i> |
| 12 | Apical joint of antenna < half length of penultimate joint (Fig. 11)..... | <i>Platynectes</i> |
| 12 | Apical joint of antenna > two thirds length of penultimate joint (Fig. 12)..... | <i>Rhantus</i> |
| 13 | Head, first five abdominal segments and tip of last abdominal segment yellow, rest dark, (Fig. 14) southern..... | <i>Australphilus</i> |
| 13 | Body more uniformly coloured (Fig. 15), northern | <i>Laccophilus</i> |
| 14 | Frontal projection with lateral notches (Figs 17,18,22,27)..... | 17 |
| 14 | Frontal projection without lateral notches (Fig. 19) | 15 |
| 15 | Last abdominal segment produced into long siphon (Fig. 21), distinct yellow/dark colour pattern | <i>Hyphidrus</i> |
| 15 | Last abdominal segment produced into relatively short siphon (Figs 20,23)..... | 16 |
| 16 | Body spindle-shaped, cerci about half length of last abdominal segment (Fig 26) | <i>Hydrovatus</i> |
| 16 | Body normally shaped, cerci > length of last abdominal segment (Fig. 25) | Bidessini |
| 17 | Siphon on last abdominal segment > 2x rest of segment (Fig. 21) | <i>Megaporus</i> |
| 17 | Siphon on last abdominal segment < 2x rest of segment (Figs 20,23,24) | 18 |
| 18 | Notch on side of frontal projection large, at least equal to the width of rest of projection at base of notch (Figs 22,27)..... | 19 |
| 18 | Notch < width of rest of frontal projection at base of notch (Figs 17,18) | 21 |



Figs 7-12. Head and last two abdominal segments of: 7, *Hydaticus* sp.; 8, *Hyderodes* sp.; 9, *Lancetes lanceolatus*; 10, *Copelatus* sp.; 11, *Platynectes* sp.; 12, *Rhantus suturalis*.

| | | |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| 19 | Apical abdominal segment with obvious siphon (Fig. 20) | <i>Chostonectes</i> |
| 19 | Apical abdominal segment virtually without siphon (Fig. 24) | 20 |
| 20 | Small pair of spines on underside of frontal projection well behind notch, lateral projections angled outwards and without small spines (Fig. 22)..... | <i>Antiporus</i> * |
| 20 | Small pair of spines on underside of frontal projection about level with notch, lateral projections long and subparallel with small spines (Fig. 27) | <i>Tiporus</i> * |
| 21 | Last abdominal segment without siphon (Fig. 24) | 22 |
| 21 | Last abdominal segment with small siphon (Fig. 23)..... | 23 |
| 22 | Middle abdominal segments noticeably wider than thoracic segments, cerci about 3x length of last abdominal segment | <i>Carabhydrus</i> * |
| 22 | Thoracic segments widest, cerci > 5x length of last abdominal segment..... | <i>Sternopriscus</i> |
| 23 | Body with 2-3 distinct bands of dark and yellow | <i>Barrethydrus</i> * |
| 23 | Body not as above..... | 24 |
| 24 | Lateral projections on frontal projection moderate (Fig. 17)..... | <i>Necterosoma</i> |
| 24 | Lateral projections on frontal projection weak (Fig. 18) | <i>Paroster</i> |

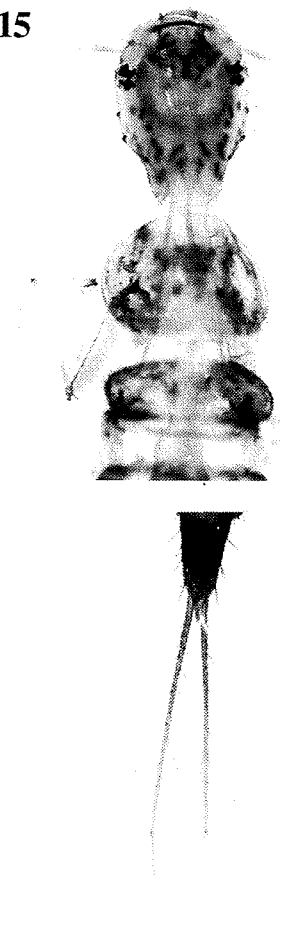
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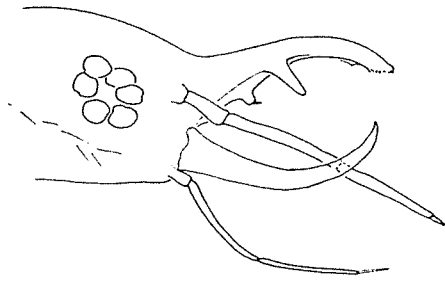
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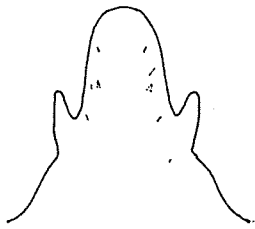
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Figs 13-15. Head and last abdominal segment of: 13, *Batrachomatus daemeli*; 14, *Australphilus saltus*; 15, *Laccophilus* sp.



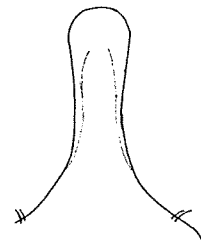
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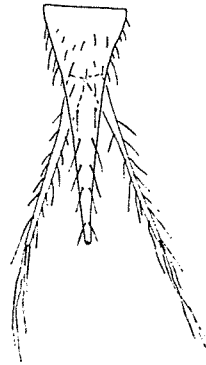
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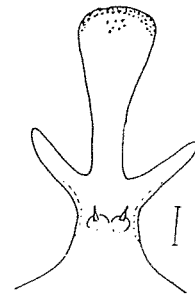
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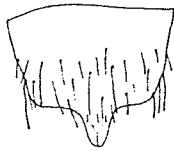
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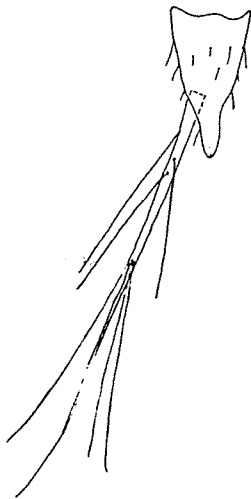
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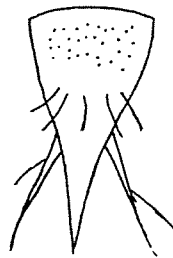
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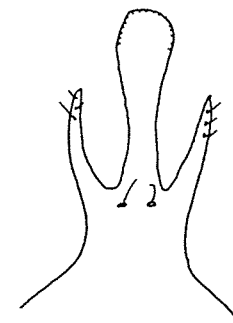
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Family DYTISCIDAE

Part III

REFERENCES

- Bistrom, O. 1982. A revision of the genus *Hyphydrus* Illiger (Coleoptera; Dytiscidae). Acta Zoologica Fennica. **165**: 1-121.
- Bistrom, O. 1988. Generic review of the Bidessini (Coleoptera, Dytiscidae). Acta Zoologica Fennica. **184**: 1-41.
- Balke, M. 1993. Taxonomische Revision der pazifischen, australischen und indonesischen Arten der Gattung *Rhantus* Deyean, 1833 (Coleoptera: Dytiscidae). Koleopterologische Rundschau. **63**: 39-84.
- Brancucci, M. 1983. Revision des especes est-palearctiques, orientales et australiennes du genera *Laccophilus*. Entomologische Arbeiten aus dem Museum G Frey **31/32**: 241-426.
- Brancucci, M & Monteith, GB. 1996. A second *Terradessus* species from Australia (Coleoptera, Dytiscidae). Entomologica Basiliensia. **19**: 585-591.
- Daussin, GL. 1980. A new name for *Hydaticus modestus* Watts, an Australian water beetle (Coleoptera: Dytiscidae). Coleopterists Bulletin. **34**:351.
- Gueorguiev, VB. 1972. Notes sur les Agabini (Coleoptera, Dytiscidae). II. Revision des genres *Platynectes* Reg. et *Colymbinectes* Falk. Izvestiya Zoologicheskaya Institut Sofia. **34**: 33-62.
- Larson, DJ. 1993. Ecology of Tropical Australian Hydradephaga (Insecta: Coleoptera). Part 1. Natural history and distribution of northern Queensland species. Proceeding Royal Society Queensland. **103**: 47-63.
- Larson, DJ. 1994. *Boongurrus rivulus*, a new genus and species of water beetle (Coleoptera: Dytiscidae: Bidessini) from northern Queensland, Australia. Journal of the Australian Entomological Society. **33**: 217-221.
- Larson, DJ & Storey, RI. 1994. *Carabhydrus mubboonus*, a new species of rheophilic water beetle (Coleoptera: Dytiscidae) from Queensland, Australia. The Canadian Entomologist. **126**: 895-906
- Matthews, E.G. 1980. A guide to the Genera of Beetles of South Australia Part 1 Archostemata and Adephaga. 68pp. South Australian Museum, Adelaide, Australia.
- Nilsson, AN, Roughley, RE & Brancucci, M. 1989. A review of the genus and family-group names of the family Dytiscidae Leach (Coleoptera). Entomologica Scandinavica. **20**: 287-316.
- Watts, CHS. 1963. The larvae of Australian Dytiscidae (Coleoptera). Transactions of the Royal Society of South Australia. **87**: 23-40.

- Watts, CHS. 1964. The larvae of Australian *Cybister* spp. Curt., *Homoeodytes* spp. Reg. And *Hyderodes skuckhardi* Hope (Coleoptera; Dytiscidae). Transactions of the Royal Society of South Australia. **88**: 145-156.
- Watts, CHS. 1978. A revision of the Australian Dytiscidae (Coleoptera). Australian Journal of Zoology. Supplementary Series No 57. 166pp.
- Watts, CHS. 1985. A faunal assessment of Australian Hydradehaga. Proceedings of the Acaemy of Natural Sciences Philadelphia. **137**: 22-28.
- Watts, CHS. 1997a. A new genus and species of Australian Dytiscidae (Coleoptera). Records of the South Australian Museum. **29**: 121-123.
- Watts, CHS. 1997b. Four new species of *Antiporus* Sharp (Coleoptera, Dytiscidae) from Australia, with notes on *A. femoralis* (Boh) and *A. interrogationis* (Clark). Records of the South Australian Museum. **30**:35-42.
- Wewalka, VG. 1994. A new species of *Chostonectes* from Australia (Coleoptera: Dytiscidae). Zeitschrift der Arbeits gemeinschaft Osterreichischer Entomologen. **46**: 140-142.
- Zwick, P. 1979. Notes on the genus *Necterosoma* (Col. Dytiscidae), with description of *N. susanna* sp. n. from Australia, Aquatic Insects. **1**: 179-184.

Family HYDROPHILIDAE

INTRODUCTION

Australian Hydrophilid beetles, or at least the adults, are becoming relatively well known thanks to the work of Hansen (1991) at the generic level and above, Gentili (1980, 92, 93), and Watts (1985, 88a, 88b, 89, 95, 97, 98a, 98b). All these authors provide keys and descriptions to genera and species altogether covering possibly 90% of the fauna. However, they are scattered, are technical and not easy for a non-specialist to use.

This is an attempt to summarise this available material to provide a guide aimed at identifying Australian genera as easily and accurately as possible. I have added a few notes on each genus that will enable users to go further if they wish. And I hope they do, since studies that stop at genera may be misleading, particularly at this early stage of our knowledge of aquatic ecosystems in Australia. And you can go further in many cases with a little extra effort. Accordingly I have indicated in the generic accounts where a non-specialist could be excused from progressing further and where it should be relatively easy to do so.

Often how a specimen is initially prepared has a great bearing on how easy it is to identify later. I prefer to work with pinned or card mounted material since it is easier to handle and in most cases characters such as the degree of pubescence are easier to see.

In a number of genera, characters of both the ventral and dorsal surface are required for identification in which case specimens should be mounted on their side or, if confident that they belong to the same species (dangerous in some cases), two specimens, one dorsal one ventral, can be mounted on the same card.

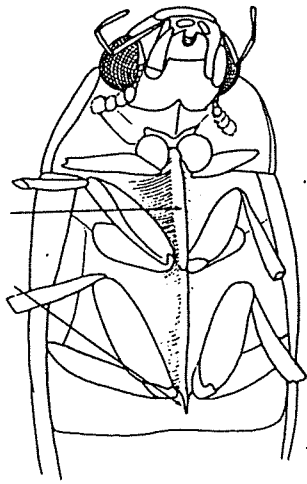
In most genera the male genitalia provide important characters and in some they are essential for identification. Dissection is best done before the specimen is mounted since removal from a card, rehydrating, dissecting, remounting and labelling is a nuisance and frustrating if it turns out to be female. Luckily for many species the aedeagus can be quite easily extruded when wet with a small pin; even if only the tip of the aedeagus is made visible this is all that is needed in many cases

Alternatively specimens can be left in spirit which I don't much like but seems to be a widespread practice in the survey world!

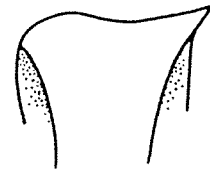
In a summary work like this I must acknowledge the excellent work of M. Hansen and E. Gentili on which I have largely based the key.

**KEY TO THE GENERA OF AUSTRALIAN AQUATIC
HYDROPHILIDAE AND RELATED FAMILIES**

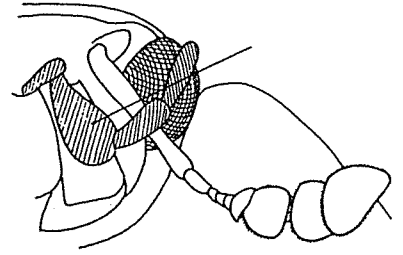
- 1 Greater than 10mm, meso- and meta-sternae with a continuous median longitudinal keel which is prolonged posteriorly into a spine between hind coxa (Fig. 1) 2
- 1 Less than 10mm, meso- and meta-sternae without a continuous common keel 4
- 2 Larger (>18mm), prosternum with deep cavity behind to receive anterior part of sternal keel, keel not notched on lower edge anteriorly *Hydrophilus* Muller
- 2 Smaller (<18mm), prosternum without cavity, sternal keel notched 3
- 3 Prosternal carinae usually produced backwards in a spine (Fig. 2); only front femurs with basal portions densely punctate and pubescent. Northern *Hydrobiomorpha* Blackburn
- 3 Prosternal carinae without spine; basal portions of all femurs densely punctate and pubescent *Sternolophus* Solier
- 4 Second segment of maxillary palpi thick (Fig. 3), basal segment of hind tarsi longer than second, 4-6mm (Fig. 4) *Coelosoma* Brullé
- 4 Second segment of maxillary palpi slender (Fig. 7), basal segment of hind tarsi shorter than second (Fig. 5) 5
- 5 Elytra carinate and/or heavily sculptured (Figs 6, 8, 9, 10) 6
- 5 Elytra not carinate, usually smooth 8
- 6 Body broad, convex (Figs 9, 10) 7
- 6 Body narrow, (Fig. 8, Colour photograph, back cover - upper left) **Hydrochidae** *Hydrochus* Leach
- 7 Less than 2mm, black (Fig. 10). **Georissidae** *Georissus* Latreille
- 7 Greater than 3mm, grey-testaceous (Figs 6, 9). **Spercheidae** *Spercheus* Kugelann
- 8 Eyes divided into upper and lower portions by extensions of side of head (Fig 13), almost spherical *Amphiops* Erichson
- 8 Eyes not so divided (Fig 15) 9



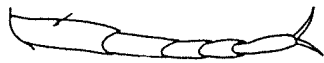
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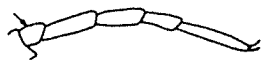
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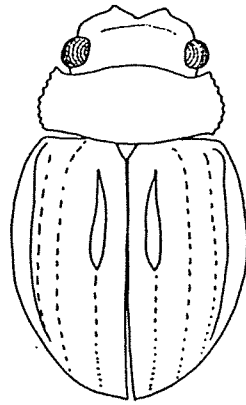
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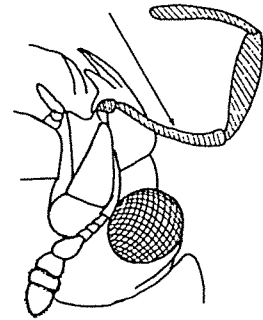
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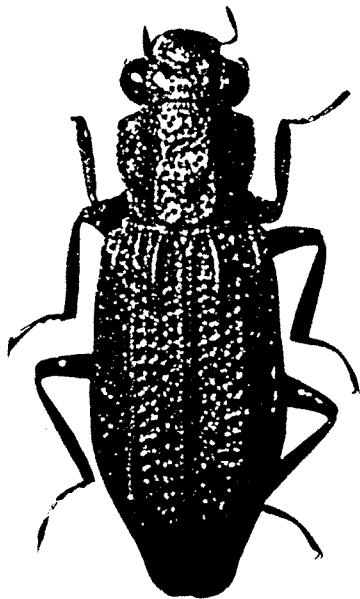
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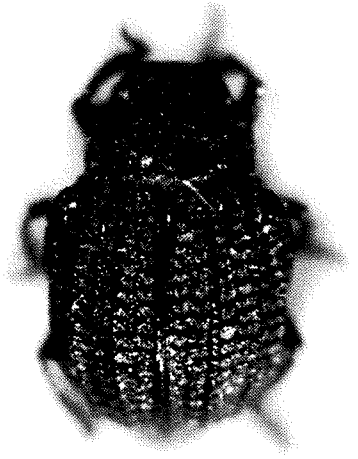
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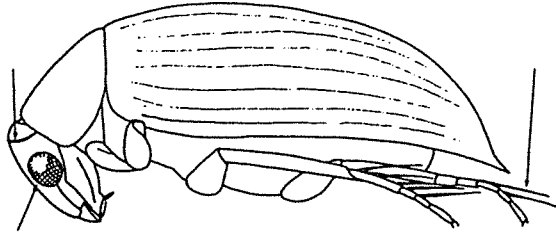


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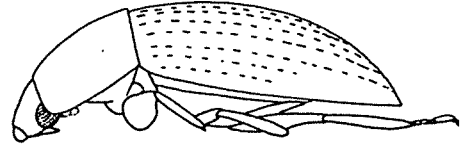


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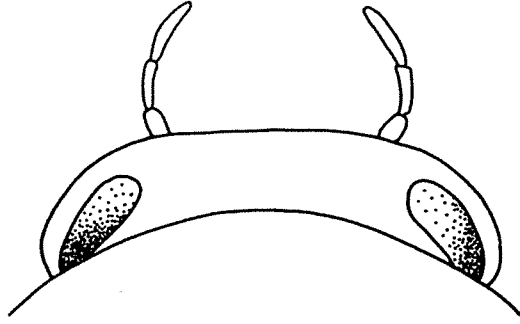
| | | |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| 9 | Head markedly deflexed (Fig. 11), often with deep transverse grooves delimiting a post occipital region; scutellum a long triangle (Fig 16), middle and hind legs with dense row of long setae (swimming-hairs) (Fig. 11) | 10 |
| 9 | Head not strongly deflexed (Fig. 12); scutellum not or not much longer than its basal width; legs with or without swimming-hairs (Fig. 12) | 12 |
| 10 | Dorsally black | 11 |
| 10 | Dorsally yellow/brown (Colour photograph, front cover - upper right) | <i>Berosus</i> Leach |
| 11 | Body almost spherical, elytra as high as long (Fig. 14), virtually without striae | <i>Allocotocerus</i> Kraatz |
| 11 | Body elongate, elytra about 2.8 x longer than high (Fig. 16), with distinct striae..... | <i>Regimbartia</i> Zaitzev |
| 12 | Maxillary palpi robust and short, shorter or not much longer than antennae, ultimate segment as long as or longer than penultimate (Fig. 17) | 13 |
| 12 | Maxillary palpi more slender, longer than antennae with ultimate segment usually shorter than penultimate (Fig. 18)..... | 21 |
| 13 | Larger, length more than 5mm..... | 14 |
| 13 | Smaller, length less than 5mm..... | 16 |
| 14 | Meso- and meta-tarsi without long swimming-hairs. | 15 |
| 14 | Meso- and meta-tarsi with long swimming-hairs (Fig 11) | <i>Limnoxenus</i> Motschulsky |
| 15 | Elytra with 10 punctate striae | <i>Hybograhius</i> d'Orchymont |
| 15 | Elytra without striae..... | <i>Enochrus</i> Thomson (in part, <i>E. mastersi</i>) |
| 16 | First abdominal segment with a large concavity on each side, normally filled with a hyaline mass, and a fringe of long setae on basal margin of segment. Northern..... | <i>Chaetarthria</i> Stephens |
| 16 | Not as above..... | 17 |
| 17 | Hind trochanters with an elongate apex and separated from the femora at their tip (Fig. 19). Elytron without a striae close to suture. Six abdominal segments, the sixth somewhat retractile into the fifth (Fig. 19)..... | <i>Laccobius</i> Erichson |
| 17 | Hind trochanters not elongate (Fig. 20). Elytron with a sutural striae (Fig 21). Five abdominal segments (Fig. 20)..... | 18 |



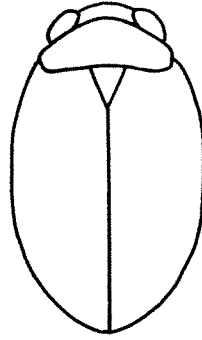
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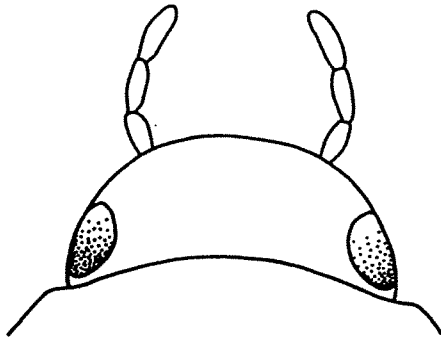
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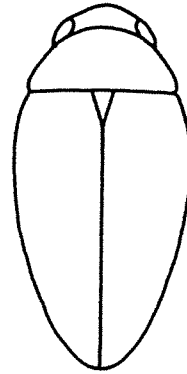
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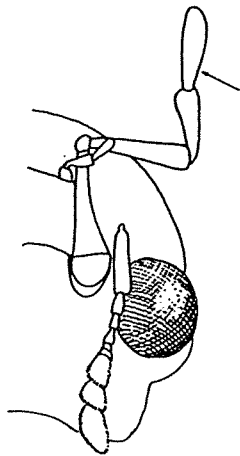
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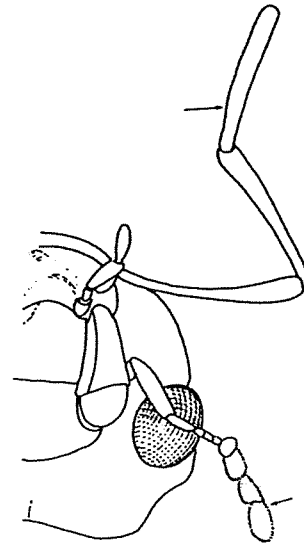
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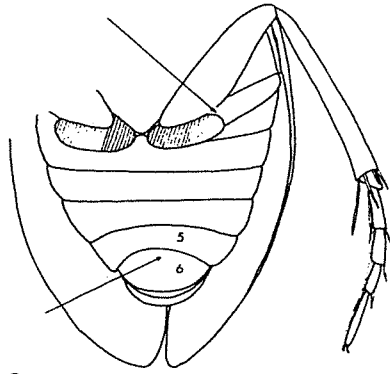


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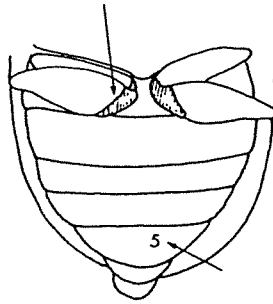


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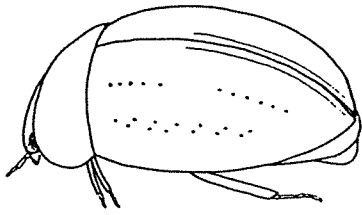
- 18 Sutural striae diverging noticeably towards front.....
..... *Enochrus* Thomson (in part, *E. peregrinus*)
- 18 Sutural striae parallel (Fig. 21) 19
- 19 Prosternum keel-shaped in the middle (Fig. 22). Hind femurs without dense hydrofugal hairs (Fig 22), never with rows of punctures on elytra *Paracymus* Thomson
- 19 Prosternum without a longitudinal keel (Fig. 23). Hind femurs, at least anteriorly, with dense hydrofugal hairs (Fig. 23), may have rows of punctures on elytra 20
- 20 Maxillary palpi a little more than four fifths times width of head (Fig. 24), labium deeply excavated. Alpine areas.....*Notohydrus* Balfour-Browne
- 20 Maxillary palpi equal to or less than half width of head (Fig. 25).....
..... *Paranacaena* Blackburn
- 21 Curved pseudobasal segment of maxillary palpi bent outwards (Fig. 26), elytra randomly punctate.....*Enochrus* Thomson (in part)
- 21 Curved pseudobasal segment of maxillary palpi bent inwards (Fig. 27), elytral punctures often in rows 22
- 22 Small (<3mm), head predominately black, pronotum and elytra yellow-brown, elytra sparsely punctured, punctures not in rows.....*Agraphhydrus* Regimbart
- 22 Not as above..... 23
- 23 Black, with sutural striae strongly marked in at least apical half, otherwise without elytral striae.....*Chasmogenus* Sharp
- 23 Black or brown, without sutural striae, with elytral striae (in all but one species, *H foveicollis*) (Colour photograph, front cover - upper left.....*Helochares* Mulsant



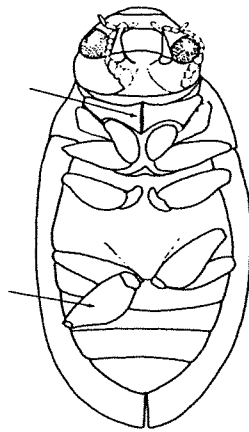
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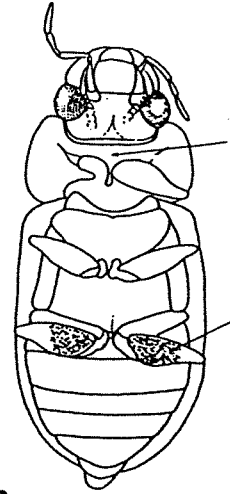
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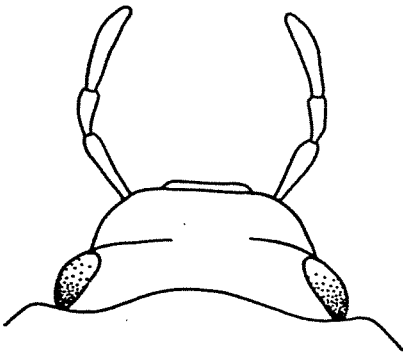
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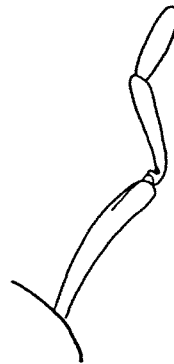
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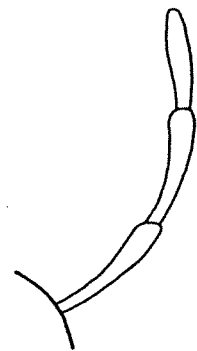
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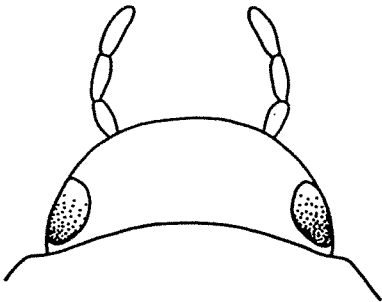
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NOTES ON GENERA

Agraphhydrus Regimbart

A widespread genus of small (<3mm) yellow/grey species with predominantly black head and greatly elongate maxillary palpi with the apical segment shorter than penultimate. The only Australian species is *A. coomani* d'Orchymont found in wetter northern areas.

Can be confused with:

Enochrus, (particularly *E. esuriens*) which has the basal segment of maxillary palpi bent outwards.

Paracymus and *Paranacaena*, which have normal sized maxillary palpi.

Allocotocerus Kraatz

A genus restricted to Australia and New Guinea with three Australian species. All are relatively small (3.5mm-4.5mm), almost spherical, black with swimming-hairs on hind legs. Found in still water or shallow creeks in tropical areas as far south as south Queensland. Only one species, *A. punctatus*, is found in eastern Australia.

Identification to species requires characters of underside so should be mounted on side. Extraction of male genitalia useful to confirm identification.

Moderately easy to identify to species (especially *A. punctatus*) using key in Watts (1998a).

Can be confused with:

Amphiops, which lacks swimming-hairs and has "divided" eyes.

Amphiops Erickson

A worldwide genus of small (<5 mm), almost spherical, red-brown to black beetles. Readily recognised by the unique division of the eye into an upper and lower portion by extension of the side of the head. The five Australian species are restricted to wetter areas of the north and east coasts as far south as northern NSW. Found in ponds and in small shallow rivers.

Identification is difficult and requires characters of at least the apical half of the male genitalia. A key is given in Watts (1998a).

Can be confused with:

Allocotocerus, which has a row of long swimming-hairs on the hind legs and lacks the extension of the side of the head which divides the eye in two in *Amphiops*.

Berosus Leach

A worldwide genus, of small to moderate sized (3.0mm-10mm), usually straw coloured beetles, with well developed swimming-hairs on the back legs. Common and widespread in Australia. Predominantly in ponds and slow moving water but a few species are found in fast cool-water rivers and streams in eastern Australia. There are 35 described Australian species.

Identification to species requires characters of the underside and often the male genitalia.

Specimens from southern Australia are reasonably easily identified to species using key in Watts, 1987, but those from northern Australia hard to key. A revision of at least the northern

species is required. Watts (1997) described additional species from inland and northern Australia.

Can be confused with:

- Laccobius*, which lack swimming-hairs on hind legs;
- Notohydrus*, which lack swimming-hairs on hind legs.

Chaetarthria Stephens

Small (<3mm), globular, shiny. Two named Australian species. Rare in still water in north. Resembles very small *Amphiops* but without divided eyes.

Cannot be confused with any other genus.

Chasmogenus Sharp

A tropical genus. The one Australian species, *C. nitescens* Fauvel, is relatively small (2.5mm to 5mm), elongate oval, rather flat, black with well marked sutural striae. It occurs in the wetter areas of northern and eastern Australia as far south as northern NSW but does not appear common. Seemingly a still water species.

C. nitescens was until recently included within *Helochares* (Hansen, 1991).

Can be confused with:

- Enochrus*, which has yellow areas in front of the eyes in all species in the size range of *Chasmogenus*, and has the basal segment of the maxillary palpi bent outwards
- Helochares*, in which all but one species are reddish brown with strongly punctate and striate elytra. The exception, *H. foveicollis*, can be separated by its lack of sutural striae;
- Paracymus* and *Paranacaena*, which have normal sized maxillary palpi, lack sutural striae and most species have some yellowish colouring.

Coelosoma Brulle

A member of the subfamily Sphaeridiinae most members of which are terrestrial but at least one species of the genus *Coelosma* is thoroughly aquatic in Australia. This species, identified in most collections as *C. fabricii*, is 4-6mm, broadly oval and black.

Can be confused with:

- Helochares* (*H. foveicollis*), *Enochrus*, and *Hybognathis* but can be separated from all these (and all other aquatic Australian Hydrophilids) by the broad squat basal segment of the maxillary palpi.

Enochrus Thomson

A worldwide genus. Australian species are small to moderately sized (1.5-9.5mm), oval, with elytral striae, most have yellow areas in front of the eyes and are otherwise yellowish to black. All but two species have greatly elongate maxillary palpi. A number of species are distinctly dimorphic in colour either having the upper surface black, apart from patches in front of the eyes, or yellowish. Fourteen Australian species which are widespread and common in still water.

Identification to species requires the apical portion of the male genitalia to be visible. This can relatively easily be extruded before mounting. They can be identified to species relatively easily using characters of the male genitalia using key in Watts (1998b). In a few closely related species female specimens cannot be identified to species.

Can be confused with:

Chasmogenus, which lacks yellow areas in front of eyes present in all similar sized (2.5-5mm) *Enochrus*.

Agraphydrus, which has the convex portion of the basal segment of the maxillary palpi bent inwards rather than outwards.

Helochares, particularly *H. foveicollis*, which has the basal segment of the maxillary palpi bent inwards rather than outwards;

Notohydrus, which lacks elongate maxillary palpi;

Hybograllus, which has rows of punctures on elytra;

Limnoxenus, which has swimming-hairs on the hind legs and distinct rows of punctures on the elytra;

Paracymus, which is deeper and rounder shaped, has normal sized maxillary palpi and lacks sutural stiae;

Paranacaena, which is deeper and rounder shaped, has distinct rows of punctures on the elytra and lacks sutural stiae.

Georissus Latreille

Very small (<2mm), highly sculptured, very compact, round, black beetles. Most Australian specimens have been taken at light in northern Australia, but the genus extends to both the south west and Victoria. The only specimens I have collected, or have good habitat data for, are from clean gravel at edges of relatively large rivers.

Three described species from Australia.

Requires revision. No key to species.

Can be confused with:

Octhebius (family Hydraenidae), which has a membraneous area at the hind corners of the pronotum.

Some Elmidae eg *Kingolus* which have long, thin antennae and much smoother surface

Helochares Mulsant

Relatively small (3-9mm), yellowish brown, rather flat and often broad, strongly punctate, elytral punctures in ten rows. An exception is *H. foveicollis*, which is shiny black with relatively smooth elytra with few, if any, puncture lines on elytra. Common and widespread in still water. Eleven Australian species.

Identification is made easier if the male genitalia are visible. Can be identified with some difficulty from the key given in Watts (1995).

Can be confused with:

Enochrus, (particularly *H. foveicollis*), which has the basal segment of the maxillary palpi bent outwards and, other than *H. foveicollis*, by the 10 rows of elytral punctures in *Helochares* which are lacking in *Enochrus*;

Chasmogenus, which has a well marked stria alongside the inner sutural edge of each elytron, and is shiny black which will separate it from all *Helochares* except *H. foveicollis*;

Notohydrus, which has normal sized maxillary palpi.

Hybograhius d'Orchymont

Relatively small, black, without swimming-hairs on hind legs and with normal sized maxillary palpi (ie not greatly elongated). One species, *H. hartmeyer*. Known from only a very few specimens from the south-west.

Could be confused with:

Enochrus, which has elongate maxillary palpi except in *E. peregrinus*, which is much smaller (<4mm), and *E. mastersi* which lacks elytral striae.

Chasmogenus, different locality and has elongate maxillary palpi;

Coelostoma, which has a thick basal segment to maxillary palpi;

Helochares, which has greatly elongate maxillary palpi;

Limnoxenus, which has swimming-hairs on hind legs.

Hydrobiomorpha Blackburn

A genus of moderate sized (10-18mm) black beetles, except for *H. helenae* which is green-black with an indistinct striping, found in shallow, still water in the tropics. There are five Australian species.

Reasonably identifiable to species using key in Watts, 1990. Characters of the underside required for identification.

Can be confused with:

Sternolophus, which has the basal portions of mid and hind femurs densely punctate/pubescent unlike *Hydrobiomorpha*;

Limnoxenus, which is smaller (<10mm) with well marked rows of punctures on the elytra.

Hydrochus Leach

A worldwide genus with 15 described (valid) Australian species and about 12 undescribed ones. Small (0.5mm to 7mm) elongate, very strongly punctate beetles, mostly testaceous to black but a number of species can be brightly iridescent gold or green. Common and widespread wherever there is permanent water in the area, with a wide range of habitats from stagnant pools to the gravel edges of major rivers.

Identification to species, or species groups, requires characters of underside and in many cases characters of the male genitalia. Since a number of superficially very similar species can be found in the same water body a good percentage of the specimens from one locality should be mounted singly, on their sides, preferably with the genitalia extracted and mounted on the same card. Because of large intraspecies variation and the likelihood of closely related

species being involved an effort should be made to collect reasonable numbers from each locality.

Cannot be identified to species using existing literature. (I am working on a revision of the genus and expect to complete it this year [1998].)

Can be confused with:

Hydreana (family Hydreanidae), which has very long maxillary palpi (>2 x length of head) compared with those of *Hydrochus* (<1 x length of head);

Octhebius (family Hydraenidae), which has a membranous area at the hind corners of the pronotum which is lacking in *Hydrochus*.

Hydrophilus Muller

A worldwide genus of large to very large black beetles with eight Australian species found throughout the country in ponds, dams and other still water. These are often temporary.

Readily identifiable to species using key in Watts (1988).

Too large (20mm to 42mm) to be confused with any other Hydrophilid.

Laccobius Erichson

Small (<4mm), rather flat, dull grey/yellow, long legged beetles with worldwide distribution. Widespread in Australia where there are eight species, but more common in northern regions, absent from Tasmania. Most often found in stones/gravel at the edge of moderate to large rivers.

Identification to species made easier if male genitalia extracted. With some difficulty can be identified to species using key in Gentili (1980).

Can be confused with:

Berosus, which has swimming-hairs on hind legs which are absent in *Laccobius*;

Enochrus, which has an elongate maxillary palpi, except in *E. mastersi* which is much larger than any *Laccobius* and black and *E. peregrinus* which has sutural striae;

Helochaeres, which has elongate maxillary palpi;

Notohydrus, which has sutural striae and is restricted to mountain streams in Australian Alps;

Agraphydrus, which has elongate maxillary palpi;

Paracymus and *Paranacaena* which have much stouter legs and lack epipleura.

Limnoxenus Motschulsky

Small-medium sized (4.5-10mm), black, hind legs with swimming-hairs, elytra with well marked rows of punctures. One Australian species (*L. zealandicus*). Common and widespread in still to moderately flowing waters.

Can be confused with:

Enochrus, particularly *E. mastersi*, but differs in having rows of elytral punctures, swimming-hairs on back legs and normal sized maxillary palpi;

Hybograllus, which lacks swimming-hairs on hind legs;

Sternolophus, which has a continuous longitudinal keel on the meso- and meta- sternae;
Hydrobiomorpha, which is larger (>10 mm) and has a continuous longitudinal keel on the meso- and meta- sternae.

Notohyrus Balfour-Browne

Small (<5 mm), rather broad and flat, yellowish to dark red-brown beetles. Restricted to mountain streams in Victoria and southern NSW. Five species.

Identification is easier using characters of the male genitalia.

Can be identified to species with some difficulty using key in Gentili (1992).

Can be confused with:

Laccobius, which lack sutural striae, locality;

Berosus, which has swimming-hairs on hind legs;

Enochrus, which has greatly elongated maxillary palpi in all species that are likely to be confused with *Notohyrus*;

Paranacaena, which has shorter maxillary palpi (see key).

Paracymus Thomson

Small (<3 mm) round to oval, relatively deep bodied, yellowish to black. Worldwide distribution. Widespread in Australia in still water to the edges of fast flowing water. Often abundant. Four described species.

Identification to genus requires characters of the underside.

Can be identified to species relatively easily using key in Wooldbridge (1976).

Can be confused with:

Paranacaena, which has the base of the hind femurs covered with dense hydrofugal hairs and often has rows of punctures on elytra which are absent in Australian *Paracymus*;

Enochrus, which has greatly elongate maxillary palpi, except *E. mastersi* which is much larger (>4mm) and *E. peregrinus* which has sutural striae;

Agraphydrus, which has greatly elongate maxillary palpi;

Chasmogenus, which is larger (>2.5mm), flatter, has much more elongate maxillary palpi and sutural striae;

Laccobius, which has much longer legs and well developed epipleura in front half of elytra.

Paranacaena Blackburn

An Australian endemic genus, separated from *Anacaena* by Gentili (1993). Small (<5 mm), deep bodied, round to oval, yellowish to black beetles which are relatively common in ponds and streams in areas where there is permanent water throughout Australia. Seven described species.

Can be identified to species, with some difficulty, using the key in Gentili (1993).

Can be confused with:

Paracymus, which does not have the base of the hind femurs covered with hydrofugal hairs and lacks rows of punctures on the elytra;

Agraphydrus, which has greatly elongate maxillary palpi;

Enochrus, which has greatly elongate maxillary palpi except *E. mastersi* (much larger) and *E. peregrinus* which has sutural striae which diverge in front.

Regimbartia Zaitzev

The only Australian species, *R. attenuata*, is 3.5mm-5mm long, shiny black, deep bodied and boat shaped with swimming-hairs on the hind legs. A still water species found in wetter tropical areas as far south as northern NSW (Watts, 1998a).

Cannot be confused with any other genus.

Spercheus Kugelann

A widespread genus, the Australian species are relatively small (<5mm), rounded and dull brown, with distinct raised areas on elytra. Predominantly northern but extends down east coast to Victoria. A still water species. Two described (*S. platycephalus* Macleay and *S. stangi* Schwartz & Barber) and one undescribed Australian species (Hebauer 1990).

No recent revision.

Cannot be confused with any other genus.

Sternolophus Solier

Moderate sized (10mm to 15mm) shiny black beetles with three widespread Australian species. Rare in the south, very common in ponds and other still water in the north, particularly in drying river beds.

Reasonably easily identified to species using key in Watts, 1989. Characters of the underside are needed for identification.

Can be confused with:

Hydrobiomorpha, which lacks punctate/pubescent areas on the base of the mid and hind femurs found in *Sternolophus*;

Limnoxenus, elytra with well marked rows of punctures.

CHECK LIST OF AUSTRALIAN AQUATIC HYDROPHILIDAE

Subfamily **Hydrophilinae**

Tribe **Berosini**

Berosus Leach

- | | | |
|------------------------------------|----------------------------------|------------------------------------|
| <i>B. amoenus</i> Watts | <i>B. josephenae</i> Watts | <i>B. queenslandicus</i> Blackburn |
| <i>B. approximans</i> Fairmaire | <i>B. juxtadiscolor</i> Watts | <i>B. ralphi</i> Watts |
| <i>B. aquilo</i> Watts | <i>B. macropunctatus</i> Watts | <i>B. reardoni</i> Watts |
| <i>B. arcus</i> Watts | <i>B. macumbensis</i> Blackburn | <i>B. sadieae</i> Watts |
| <i>B. australiae</i> Mulsant | <i>B. majusculus</i> Blackburn | <i>B. sarahae</i> Watts |
| <i>B. dallasae</i> Watts | <i>B. munitipennis</i> Blackburn | <i>B. sonjae</i> Watts |
| <i>B. debilipennis</i> Blackburn | <i>B. nicholasi</i> Watts | <i>B. subovatus</i> Knisch |
| <i>B. decipiens</i> Blackburn | <i>B. niger</i> Watts | <i>B. timmsi</i> Watts |
| <i>B. discolor</i> Blackburn | <i>B. niger</i> Watts | <i>B. trishae</i> Watts |
| <i>B. duplopunctatus</i> Blackburn | <i>B. nutans</i> (W. MacLeay) | <i>B. veronicae</i> Watts |
| <i>B. gibbae</i> Watts | <i>B. pulchellus</i> W. MacLeay | <i>B. vijaë</i> Watts |
| <i>B. involutus</i> (W. MacLeay) | <i>B. quadrapunctatus</i> Watts | <i>B. wadeae</i> Watts |

Regimbartia Zaitzeu

R. attenuata (Fabricius)

Allocotocerus Kraatz

A. punctatus (Blackburn)

A. tibiale (Balfour-Browne)

A. yalumbothbyi Watts

Tribe **Chaetarthriini**

Amphiops Erichson

A. australicus Blackburn
A. austrinus Watts

A. micropunctatus Watts
A. duplopunctatus Blackburn

A. queenslandicus Balfour-Browne

Chaetarthria Stephens

C. australis Knisch
C. sjostedti Knisch

Tribe **Anacaenini**

Notohydrus Balfour-Browne

N. australis (Blackburn)
N. kosciuskoi Gentili

N. margaretae Gentili
N. montanus (Blackburn)

N. newtoni Gentili

Paracymus Thomson

P. desolatus Wooldridge

P. pygmaeus (W. MacLeay)

P. spenceri (Blackburn)

Paranacaena Blackburn

P. eremita (Blackburn)
P. horni (Blackburn)
P. lindi (Blackburn)

P. littoralis (d'Orchymont)
P. nitens Gentili
P. sublineata (Blackburn)

P. wattsi Gentili

Tribe **Oocyclini**

Laccobius Erichson

L. bicaudatus Gentili

L. brittoni Gentili

L. clarus Gentili

Tribe **Hydrophilini**

Subtribe **Acidocerina**

Agraphydrus Regimbart

A. coomani (d'Orchymont)

Helochaeres Mulsant

H. anthonyae Watts

H. clypeatus (Blackburn)

H. dalhuntii Watts

H. foveicollis (Montrouzier)

L. collium Gentili

L. decipiens Gentili

L. marmoratus (W. MacLeay)

L. matthewsi Gentili

L. zietzi Blackburn

H. loweryae Watts

H. luridus (W. MacLeay)

H. marreenis Watts

H. percyi Watts

H. tatei (Blackburn)

H. tenuistriatus Regimbart

H. thurmerae Watts

H. tristis W. MacLeay

Chasmogenus Sharp

C. nitescens (Fauval)

Enochrus Thomson

E. aliciae Watts

E. deserticola (Blackburn)

E. eubangeei Watts

E. elongatus (W. MacLeay)

E. esuriens (Walker)

E. eyrensis (Blackburn)

E. isabellae Watts

E. maculiceps (W. MacLeay)

E. malabarensis Regimbart

E. mastersi (W. MacLeay)

E. peregrinus Knisch

E. pseudoweiri Watts

E. samae Watts

E. weiri Watts

Subtribe **Hydrobiina**

Hybograhius Orchymort

H. hartmeyeri (Regimbart)

Limnoxenus Motschulsky

L. zealandicus (Broun)

Subtribe **Hydrophilina**

Sternolophus Solier

S. australis Watts

S. immarginatus d'Orchymont

S. marginicollis (Hope)

Hydrobiomorpha Blackburn

H. bovilli (Blackburn)

H. debbae (Watts)

H. helenae (Blackburn)

H. microspina (Watts)

H. troxi (Watts)

Hydrophilus Muller

H. albipes Castelnau

H. brevispina Fairmaire

H. infrequens Watts

H. latipalpus Castelnau

H. macronyx (Regimbart)

H. pedipalpus (Bedel)

H. picicornis Chevrolat

H. viridis Watts

Subfamily **Sphaeridiinae**

Tribe **Coelostomatini**

Coelosoma Brullé

C. fabricii (Montrouzier)

REFERENCES

- Gentili E. 1980. The genera *Laccobius* and *Notohydrus* (Coleoptera, Hydrophilidae) in Australia and New Zealand. Records of the South Australian Museum **18**:143-154
- Gentili E. 1992. The *Notohydrus* of Australia (Coleoptera Hydrophilidae). Boll. Society Entomology Italian Genova **124**:21-26.
- Gentili E. 1993. *Paranacaena* Blackburn, 1889: a valid genus (Coleoptera, Hydrophilidae). Gioruale italiano di entomologia **6**:285-296.
- Hansen M. 1991. The Hydrophiloid Beetles. Phylogeny, Classification and a revision of the genera (Coleoptera, Hydrophiloidea) Biogiske Skrifter 40. The Royal Danish Academy of Science and Letters. Copenhagen 367pp.
- Hebauer, von F. 1990. Drei neue Arten der Gattung *Spercheus* Kugelann aus der Orientalschen Region (Coleoptera: Spercheidae). Acta Coleopterologica **4**: 1-8.
- Matthews E.G. 1982. A guide to the Genera of Beetles of South Australia Part 2 Polyphaga: Staphylinioidea and Hydrophiloidea. 64pp. South Australian Museum Adelaide, Australia.
- Watts C.H.S. 1987. Revision of Australian *Berosus* Leach (Coleoptera: Hydrophilidae). Records of the South Australian Museum **21**:1-28.
- Watts C.H.S. 1988a. Revision of Australasian *Hydrophilus* Muller, 1764 (Coleoptera: Hydrophilidae). Records of the South Australian Museum **22**:117-130.
- Watts C.H.S. 1988b. Revision of Australasian *Sternolophus* Solier (Coleoptera: Hydrophilidae). Records of the South Australian Museum **23**:89-95.
- Watts C.H.S. 1989. Revision of Australian *Hydrobiomorpha* Blackburn (Coleoptera: Hydrophilidae). Records of the South Australian Museum **24**:35-42.
- Watts C.H.S. 1995. Revision of the Australasian genera *Agraphydrus* Regimbart, *Chasmogenus* Sharp and *Helochares* Mulsant (Coleoptera: Hydrophilidae). Records of the South Australian Museum **28**:113-130.
- Watts C.H.S. 1997. Three new *Berosus* Leach (Coleoptera: Hydrophilidae) from Australia. Records of the South Australian Museum **29**:147-152.
- Watts C.H.S. 1998a. Revision of Australian *Amphiops* Erichson, *Allocotocerus* Kraatz and *Regimbartia* Zaitzeu (Coleoptera: Hydrophiloidea). Records of the South Australian Museum. In press.
- Watts C.H.S. 1998b. Revision of Australian *Enochrus* (Coleoptera: Hydrophilidae). Records of the South Australian Museum. In press.
- Wooldridge D.P. 1976. *Paracymus* of the Australian Faunal Region. Journal of the Kansas Entomological Society **49**:453-462.