Pictorial Guide to the Diving Beetles (Dytiscidae) of South Australia

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**Introduction**

Among the most important insects in fresh water in South Australia are the diving beetles (Family Dytiscidae). This is particularly true of still water – ponds, dams, slow flowing creeks and swamps. Adults range in size from 30mm. down to 1.0mm. Their larvae are voracious insectivores, eating mainly other insects and crustaceans but the larger species also include fish and tadpoles in their diet. The adults are more scavengers on dead and dying prey but the larger species will also attack small fish and tadpoles. Adults disperse by flying and are often found around lights on warm nights.

Biogeographically the South Australian diving beetle fauna is typical of the southern temperate fauna of Australia with only a few tropical species occasionally recorded such as the two records of tropical *Hydrovatus* species. The large *Cybister tripunctatus* which is abundant in the north of the State is an exception. This seems to be a particularly adaptable species as it, or a closely related species, is found in Asia and Africa.

Being a typical Mediterranean type climate an important and rather specialized habitat are the seasonally dry creeks in the Mount Lofty Ranges with their own specialized suite of species, notably species of *Paroster, Necterosoma* and *Exocelina*. Also important are the acidic swamps of the lower Fleurieu Peninsula and the lower South East and adjacent areas of Victoria which are home to several rare species. *Paroster nigroadumbratus, Necterosoma dispar* and the subterranean *Paroster extraordinarius* are the only endemic South Australian species with the first two restricted to seasonal creeks in the Mount Lofty Ranges.

Unlike Western Australia with around 100 subterranean species (Watts & Humphreys 2009) there is only one subterranean species in South Australia, *Paroster extraordinarius*, know from two specimens from a well in the Flinders Ranges. Sampling subterranean habitats is difficult so perhaps more await discovery in the State.

The aim of this guide is to enable all the 50 species known from South Australia to be identified from photographs of adult beetles. We feel that this is feasible except in a handful of case were dissection to expose the male genitalia is required or where only male specimens are identifiable to species. For the larger species identification should be possible with the naked eye, for the smaller this may also be possible in many cases but the use of a magnifying glass or binocular microscope would help.

It is hoped that the ability to relatively easily identify species will be a help to those interested in the biodiversity of their local fresh water, such as schools, environmental groups and water-care groups to better talk about, conserve and enjoy their local aquatic environment.
Life history and Biology

The larvae of all the species are aquatic, feeding on prey smaller than themselves. They have been given the common name, 'water tigers', which is particularly appropriate for the larger ones – up to 8 centimetres long. They feed by injecting digestive juices into the body of their prey and sucking up the digested contents of their prey through their tubular mandibles. (An exception is the genus *Exocelina* which swallow their prey – usually midge larvae – whole.) After three moults, when they shed their skin and expand whilst the new skin is soft, the larvae leave the water and dig or build a cell in the bank in which to pupate. After usually 1-2 weeks the adults emerge and head back to the water.

All species, both adult and larvae, breath air and must, except for the very small larvae, come to the water surface periodically to breath. Fresh air is taken into breathing tubes or trachea when the hind end of the beetle is pushed through the surface of the water, the beetles staying suspended using the surface tension of the water. How often they need to do this depends on their size, activity and water temperature, most usually once every 10 to 30 minutes.

What is not known is how they over-winter or over-summer when the water is too cold or absent. When do the adults appear/disappear, larvae appear/disappear? Simple basic facts such as these are unknown for Australian species. Nor such things as the seasonal composition of species present in a water body. Fertile fields for keen observers.

A prerequisite to understanding a species’ life cycle is the ability to identify its lava. The larvae of all the South Australian genera are known (Watts 2002) and also a number of species (Yves & Watts 2004) but the larva of a number of species are not known or at least not yet described. Larvae and adults can be associated by matching their DNA or by rearing the larvae. Rearing can be done using a simple aquarium made of a small petri dish bottom inside a large petri dish and the space between them filled with damp sand. The larvae are placed with some water in the small central dish and fed small invertebrates such as mosquito larvae. When ready to pupate they leave the water and build a cell in the sand in which they pupate.

Taxonomy

The taxonomy – working out how many different kinds of water beetles there are in South Australia – is relatively well known although new species and new distributions are still being discovered. In two genera, *Exocelina* and *Platynectes*, the taxonomy is unsettled or in need of a revision. We have used the taxonomy currently being used by the Australian Biological Resources Survey, Australian Department of the Environment, Canberra and the South Australian Museum.
Using the guide

In using the guide it is, of course, important to be sure that the specimen that you are dealing with is in fact a diving beetle as they are several other families of beetles living in still or slow flowing fresh water in South Australia the members of which can be confused with diving beetles.

*Screech beetles* (Family Hygrobiidae) with one species in South Australia;

*Scavenger beetles* (Family Hydrophilidae) with almost as many species as the diving beetles;

*Whirligig beetles* (Family Gyrinidae) with 19 species


*Crawling water beetles* (Family Haliplidae) with three species in South Australia;


*Diving beetles* (Family Dytiscidae) with 50 species in South Australia.

Plate 1 illustrates how these can be told apart from diving beetles— the subjects of the guide.

These families are also illustrated in various guide books on aquatic macroinvertebrates. These are particularly useful in identifying aquatic beetle larva and separating adult beetles, of all families, from aquatic Hemiptera (water boatman etc.) which can be confused with them. Remember, bugs have beaks and suck, beetles have jaws and chew. A good start is ‘The Waterbug Book” by John Gooderham and Edward Tsyrlin. CSIRO Publishing 2002.
Identifying species in this guide

To facilitate their identification we have divided the 57 species known to be present in South Australia into eight groups based on their size and colour, irrespective of their scientific classification (Plate 2 opposite). Each group of species is then presented on one page to aid identification by direct comparison. In many cases an arrow points to features useful in identification. In some cases specific structures useful for identification are enlarged. This grouping works for most specimens but inevitably there will be specimens that are unusually large or small or more strongly or less strongly coloured than usual. So if the specimen does not clearly fit into a group other plates should be perused. If still unsure bring or send a specimen (in a preservative such as methylated spirits), to the South Australian Museum Information Section. Alternatively often a photograph is sufficient for an identification (information@samuseum.sa.gov.au). The sections on ‘Further Reading’ and ‘References’ are extensive and will enable users to access further details on the species.

The illustrations are numbered and short notes on the habitat, distribution and identification of each species are given later under that number (pp18-27).

**NB. The guide is only relevant to South Australia. It may be of some, but necessarily limited, use outside the State.**
Plate 3  Very large,
(length greater than 20mm.)

Plate 4  Large
(length 12 - 15 mm.)

Plate 5  Moderate size
(length 6.0 - 9.0mm.) black or nearly so.

Plate 6  Moderate size
(length 4.0 - 7.0mm.) with distinct linear dorsal colour pattern.

Plate 7  Moderate size
(length 4.0 - 7.0mm.) with non-linear dorsal colour pattern.

Plate 8  Moderate size
(length 4.0 - 7.0mm.) uniformly coloured or nearly so.

Plates 9 & 10  Small
(length 2.0 - 3.5mm) without a clear dorsal colour pattern.

Plate 11  Small
(length 1.0 - 3.5mm), with a variegated dorsal colour pattern.
Figs 15 – 20. Medium sized black species. 15 &15a, Male and female Exocelina simplex. 16, Exocelina australis. 17, Platynectes reticulosus. 18, Platynectes decempunctatus. 19, Platynectes bakewelli. 20, Platynectes aenesens. Enlarged area shows hind angle of the pronotum.
Figs 21 – 24. Medium sized species with linear markings. NB, only males of *Necterosoma* shown, females which lack notch on front leg are not easily identified. 21, *Necterosoma dispar*, 21a, detail of front leg. 22, *Necterosoma penicillatum*, 22a, detail of front leg. 23, *Necterosoma undecimlineatum*, 23a, detail of front leg. 24, *Antiporus gilbertii*. 
Figs 30 – 36. Medium sized species without a clear dorsal colour pattern. 30, Megaporus wilsoni. 31, Megaporus gardeneri. 32, Antiporus blakei. 33, Antiporus femoralis. 34, Chostonectes nebulosus. 35, Exocelina ferruginea. 36, Exocelina australis.
Figs 46-49. Small species without a clear dorsal colour pattern. 46 a,b &c, *Allodessus bistrigatus*, a) dorsal view, b) ventral view of female, c) ventral view of male. 47, *Limbodessus shuckardii*. 48, *Limbodessus gemellus*. 49, *Limbodessus amabilis* or *Limbodessus praelargus* (only separable by male genitalia). Blow ups are of pronotal and elytral grooves. Also incuded are diagrams of the strong ventral punctures in *Allodessus bistrigatus* and the weaker ones in *Limbodessus* species.
Figs 50-55. Small species with a variegated dorsal colour pattern. 50-55, Species of Sternopriscus. Mostly only separable by shape of male antenna. Males can be recognized by a small indentation on the front leg (54b). 50 & 50a, Sternopriscus meadfootii. 51 & 51a, Sternopriscus tasmanicus. 52 & 52a, Sternopriscus multimaculatus. 53 & 53a, Sternopriscus tarsalis. 54, 54a & 54b, Sternopriscus wehnckei. 55 & 55a, Sternopriscus clavatus.
Notes on the species.  (Numbers refer to the illustrations.)

Plate 1.  Families of water beetle found in South Australia that may be mistaken for diving beetles.

1  Screech beetles (Family Hygrobidae). The family is recognized by its protruding eyes, thin antennae and lack of swimming hind legs. When handled they may produce a screeching sound hence the common name for the family. The illustrated species is *Hygrobia australis* (the common Australian screech beetle) a rarely collected beetle living in ponds and dams in the lower South-east of South Australia. Also found in coastal regions of the East Coast. Three other species are known from Australia, none of which are found in South Australia.

2  Scavenger water-beetles (Family Hydrophilidae). A family with numerous species in South Australia recognized by; club-like antennae (often with long thin maxillary palpi which can be mistaken for antennae) and crawling legs. The illustrated species is *Limnoxenus zelandicus*, a common, uniformly black, beetle found in ponds, dams and slow-moving creeks. Found throughout Australia.

3  Whirligig beetles (Family Gyrinidae). The family is recognized by; the split eyes (upper and lower) and short, paddle-like hind legs. The illustrated species is *Macrogyrus reichei* (Reich’s whirligig beetle) which is relatively commonly seen on the surface of still pools in forest creeks. Several other species occur in South Australia. (See ‘Pictorial guide to the Australian Whirligig beetles’.)

4 and 5 Crawling water-beetles (Family Haliplidae). The family is recognised by their thin antennae and crawling legs. There are three species in South Australia, two of which, *Haliplus fuscatus* and *H. gibbus* (4), cannot be told apart other than by examination of the male genitalia. The other is *Haliplus australis* (5) which differs from the other two species by its larger size and lack of groves on the pronotum. All the species are found in ponds and still pools in creeks in the Mt Lofty Ranges and lower South-east.

6  Diving beetles (Family Dytiscidae). The family is recognized by the thin antenna and swimming hind legs. Over 300 named Australian species, 57 of which are known from South Australia, ranging in size from 1 to 30mm. and found in all fresh water habitats. An unusual feature of the Australian fauna is the presence of over 100 small species which live in underground water, mostly in calcrete aquifers in the Yilgarn region of Western Australia. Only one such species (*Paroster ordinarius* (49) has so far been found in South Australia.
Plate 3. Group 1. Very large, body length greater than 20mm.

7  **Cybister tripunctatus.** Together with *Onychohydrus scutellaris* (8) the largest diving beetle in South Australia. Common, sometimes very common, in pools and dams north of Port Augusta but has also been collected as far south as Adelaide and the lower lakes. Also common in northern Australia. The species (or closely related ones) are found across southern Asia and into Africa and southern Europe.

Superficially very similar to *Onychohydrus scutellaris* (8) but easily separated by its black underside, which is reddish-yellow in *Onychohydrus scutellaris*.

8  **Onychohydrus scutellaris.** Widespread south of about Adelaide, more common in the lower South-east. Found in ponds, dams, swamps and temporarily flooded areas. Also occurs in southern Western Australia, Victoria and Tasmania. Separated from the otherwise very similar *Cybister tripunctatus* (7) by the light coloured underside.

9  **Hyderodes shuckardii.** A very distinctive species found in ponds and temporarily flooded areas in the South-east as well as Victoria, southern New South Wales and Tasmania. *Hyderodes crassus*, a closely related species, occurs in southern Western Australia. Unmistakable by its large size, black colour with a bit of red on the pronotal margins. The females are dimorphic; one form being shiny like the male the other strongly granulated on the upper surface (illustrated). Occurred in the Adelaide Hills in the 1950’s but has not been collected there recently.

10 **Spencerhydrus latecinctus.** Smaller and narrower than the similarly coloured *Cybister tripunctatus* (7) and *Onychohydrus scutellaris* (8). The yellow boarders are broader than in *Onychohydrus scutellaris* which is found in the same areas. *Spencerhydrus latecinctus* is restricted to spring-flooded areas in the lower South-east and adjacent areas of Victoria. *Spencerhydrus pulchellus*, a related species, is known from South-west Western Australia.

11 **Rhantus suturalis.** One of the commonest diving beetles in southern Australia. Found in dams, ponds and at the sides of rivers and creeks throughout the State. *Rhantus suturalis* is a very widespread beetle ranging from Australia through southern Asia to the British Isles. Easily recognized in South Australia by its size and the numerous small dark spots on the dorsal surface. The species (and the genus) is superficially similar to several species in the genus *Hydaticus* in eastern and northern Australia. A slightly larger species is known from south-western Western Australia and numerous species are known from areas to the north of Australia.

12 **Lancetes lanceolatus.** A relatively common species in dams, ponds and creeks in southern Australia. Recognised by its size and strongly striped colour pattern. Only one species of *Lancetes* is
known from Australia and New Zealand with other species in South America and the Falklands Islands – an example of a Gondwanan distribution.

13 **Hydaticus chrisi.** The only member of the large genus *Hydaticus* in South Australia. *Hydaticus chrisi* is easily recognized by its size and dorsal colour pattern. It has an unusually restricted distribution, found only in the southern Lake Eyre basin and the Paroo basin in New South Wales. It is rarely collected.

14 **Eretes australis.** One of Australia’s commonest water beetles *Eretes australis* occurs throughout the State but is much commoner in inland areas frequently occurring in high numbers in dams. It flies readily so is often seen around lights. A specimen of a South-east Asian species is known from Darwin but otherwise *Eretes australis* is the only Australian representative of the genus which occurs across Asia to Europe. A distinctive species, unusual in having the surface punctuation on the prothorax much smaller than on the wing cases.

**Plate 4. Group 2. Medium size (6.0 – 9.0mm. long) predominately black.**

15 **Exocelina simplex.** Relatively common in spring in pools and flooded ditches. Recognized by its size, colour and narrow shape. Often found together with the larger *Exocelina australis* (16). The dorsal surface of females is rugose to varying degrees giving the surface a mat finish. (NB The genus *Exocelina* is at present being revised taxonomically and both species 15 and 16 are each expected to consist of several species within Australia. When resolved this may change their scientific names.)

16 **Exocelina australiae.** Recognized by its size, elongate shape and shiny black surface. *Exocelina australiae* is relatively common in the wetter areas of the State in shallow still water, most frequently among decaying leaves at the edges of shaded forest pools. This, or closely similar species, occur commonly across south-eastern Australia and Tasmania.

17 **Platynectes reticulosus.** Similar in size to *Platynectes decempunctatus* (18) and *Platynectes aenescens* (20), *Platynectes reticulosus* is recognized by its generally chunkier shape and mat dorsal surface. Most examples also have a broad yellowish border. The hind angles of the pronotum are right angles. Found, often together with *Platynectes decempunctatus* (18), in weedy ponds and shallow portions of creeks. It is commonest in the South-east and is also found in New South Wales, Victoria and Tasmania.

18 **Platynectes decempunctatus.** Recognized by its size, shiny surface and, usually, its narrow yellow markings on the wing cases. The only *Platynectes* in South Australia with acute hind angles to the pronotum. The species as currently defined is found in all States and territories. (We have followed
the usage of Watts, 1978 for the name of this species but this is very unlikely to be its correct name once a much needed revision of the genus is done, nor is it likely to have such an extensive distribution.)

19  *Platynectes bakewelli*. The rarest and smallest of the South Australian species of *Platynectes*, found in shallow acidic swamps in the lower Fleurieu Peninsula. The species occurs in similar habitats in Victoria and Tasmania where it is more commonly collected. Recognized by its small size, flattish form, uniform colour and square hind angles to the pronotum.

20  *Platynectes aenescens*. Not commonly collected. Occurring in swamps and at the shallow margins of creeks. Recognized by its weakly iridescent surface colour, small amount of yellow markings on the wing cases – rather similar to those in *Platynectes decempunctatus* – and square hind angles of the pronotum. Confused most readily with *Platynectes reticulosus* but never as mat nor with broadly yellow sides.

**Plate 6. Group 4. Medium size (4.5 – 7.0mm. long) with clear linear colour pattern on wing cases.**

21  *Necterosoma dispar*. One of the few South Australian endemic water beetles this common beetle is restricted to pools, dams and creeks of the Mt Lofty Ranges, Flinders Ranges and Kangaroo Island. Similar in most respects to *Necterosoma penicillatum* (22) and often occurring together. Separated from *Necterosoma penicillatum* by the much larger notch on the front legs of males. Also never has the raised ridges on the wing cases seen in some specimens of *Necterosoma penicillatum*. From *Necterosoma undecimlineatum* (23) it differs in the deeper notch on the front legs of the male and has the linear markings more broken up.

22  *Necterosoma penicillatum*. One of the commonest water beetles in southern Australia including Tasmania. Males are recognised by the weak notch on the front legs. Many specimens have a slight ridge on each wing case, this character being much more obvious in some populations than others, notably in Tasmania and the Victorian Alps.

23  *Necterosoma undecimlineatum*. Not as common as the other South Australian *Necterosoma* (21, 22) but occurs in similar habitats, occasionally all three species living together. A reddish species with more uniform and unbroken linear dark markings than the other species. The notch on the male front legs is relatively strong but not as deeply incised as in *Necterosoma dispar* (21). A widespread species in southern Australia as far north as the Pilbara in Western Australia and Julia Creek in Queensland. Apparently absent from Tasmania.

24  *Antiporus gilberti*. A widespread relatively common species found mainly in ponds and dams across southern Australia and Tasmania including inland areas. Recognized by its larger size and
broken linear colour pattern. Males have a distinctive strong hook on the inner edge of the hind femurs.

Plate 7. Group 5. Medium size (4.5 – 7.0 mm. long), with colour pattern on upper surface.

25 *Megaporus howitti.* A moderately common species over much of Southern Australia. Found in ponds, dams and in the slower flowing portions of creeks. Could be confused with *Hyphydrus elegans* (30) which can occur with it but is larger and differently patterned, notably on the prothorax.

26 *Megaporus hamatus.* A common species in shallow ponds, dams and slowly moving water often together with *Megaporus howitti.* Occurs across much of southeastern Australia including Tasmania. Separated from *Megaporus howitti* (25) by the different colour pattern. Occasional specimens have a reduced or absent lateral pale stripe.

27 *Chostonectes gigas.* Found at the sides of dams and ponds in the Mt Lofty Ranges and the South-east as well as Victoria, New South Wales and Tasmania with isolated populations in the Mac Donnell Ranges and Atherton Tableland. Recognized by its colour pattern, particularly the black pronotum. Some individuals are almost totally black lacking most of the colour on the wing cases

28 *Hyphydrus lyratus.* A common and widespread species in still or slow moving water in northern Australia. A few specimens have been collected from northern South Australia. Also occurs in countries to the north of Australia. The different colour pattern separates it from the rather similar *Hyphydrus elegans* (30), the two species often occurring together. Males are unique in having a strong spine on the abdomen.

29 *Hyphydrus elegans.* A common species over much of northern and inland Australia. Occurring much further south (to southern South Australia and Victoria) than *Hyphydrus lyratus* (29). Found mainly in ponds and dams. Superficially similar to *Megaporus howitti* (25) but considerably smaller and with more dark colour on the pronotum. Males lack the large abdominal spine found in *Hyphydrus lyratus.*

Plate 8. Group 6. Medium size (4.0 – 7.0mm. long), without, or with only a slight colour pattern on the wing cases.

30 *Megaporus wilsoni.* A seldom collected species from ponds and seasonally flooded areas in the lower South-east and adjacent areas of Victoria. Difficult to separate from *Megaporus gardeneri* (32) which occurs in the same area but *Megaporus wilsoni* is more elongate and shinier.
31 **Megaporus gardeneri.** Found sparingly in vegetated ponds, dams and small creeks in the Mt Lofty Ranges and the South-east. A large, robust, strongly punctate species with a relatively mat dorsal surface. Can be confused with the rare *Megaporus wilsoni* (31) which is more elongate and shinier. Occurs with it in ponds and flooded areas in the lower South-east and adjacent areas of Victoria.

32 **Antiporus blakei.** A relatively common species found in ponds and dams in better watered regions of the State and also across southern Australia and Tasmania. Can be confused with the similar sized *Chostonectes nebulosus* (35) which occurs in similar habitats. Both species have indistinct pale markings on the dorsal surface which sometimes, particularly in newly emerged individuals, can be quite well marked. Can be separated from this species by its less oval shape and dark areas on the head and pronotum.

33 **Antiporus femoralis.** Relatively common in still water in southern South Australia and across south-eastern Australia and Tasmania. A very similar species occurs in the southwest of Western Australia. Separated from other species on this plate by the well-marked yellow margin to the pronotum. Some specimens also have quite well marked yellow markings on the front portions of their wing cases. Males have a broadly triangular extension on the inside of their hind legs.

34 **Chostonectes nebulosus.** A relatively common species in ponds and dams across south-eastern Australia often in leafy detritus in shallow areas. Can be confused with *Antiporus blakei* (33) but can be separated by its lighter coloured head and pronotum, more evenly oval shape. Although included in this plate the colour pattern on the wing cases can be quite noticeable in some specimens.

35 **Exocelina ferruginous.** A common and widespread beetle found in shallow water at the edge of pools and creeks in southern and eastern Australia often with *Exocelina simplex* (15) which is similar in size and shape but much darker in colour. The taxonomy of this and related species is being reviewed and it is probable that this widespread species will prove to consist of several different but closely related species.

36 **Exocelina australis.** A seldom collected beetle. In South Australia only known from within coarse gravels just above the waters’ edge in creeks in the Flinders Ranges. Otherwise know from near Canberra from gravel at the edge of a drying pool in a small creek. Easily recognized by its uniform reddish colour and parallel sides.
Plate 9 & 10. Group 8. Small size (2.0 – 3.5mm. long), without or with only an indistinct dorsal colour pattern.

37  **Limbodessus extraordinarius.** The only truly underground water beetle known from South Australia. Recognized by its small size, pale colour and lack of eyes. Known from only two specimens collected from a well on Willow Springs Station in the Flinders Ranges.

38  **Gibbidessus chipi.** The smallest above ground, diving beetle in South Australia, known from shallow ponds and flooded areas in the southern Fleurieu Peninsula and the lower South-east. Also known from adjacent areas of Victoria and from near Canberra. Recognized by its small round shape and groves on the pronotum.

39  **Paroster nigroadumbratus.** One of the earliest water beetles to appear in late winter and early spring, colonizing shallow temporary water in open forest areas. Water in such areas can be surprisingly warm and biologically productive in late winter. The beetles are gone by early November. Separated from **Paroster insculptilis** (52) which is often found in the same water body, by its larger size, deeper body and grey colouration. It is considerably smaller but similar in colour to the very rare **Paroster thapsinus** (51). Endemic to the Mt Lofty Ranges.

40  **Paroster thapsinus.** A very rare species with only two specimens collected in the last 50 years, one from Western Australia and one from South Australia. The South Australia specimen was collected from Tatiara creek at Bordertown in 1995. Separated from the similarly coloured **P. nigroadumbratus** (50) by its large size and black pronotum.

41  **Paroster insculptilis.** A seldom collected species found, often together with **Paroster nigroadumbratus** (50), in very shallow water in late winter or early spring. Known from the Mt Lofty Ranges and southern Victoria. Separated from **Paroster nigroadumbratus** by its smaller size and uniform reddish colour. A little larger and more elongate than **Paroster gibbi** (53).

42  **Paroster gibbi.** A small species found in acidic swamps in the southern Fleurieu Peninsula and lower South-east and also in adjacent areas of Victoria. Like the other species of **Paroster** an inhabitant of shallow, temporary water in spring. Resembles **Paroster insculptilis** (52) but is smaller and rounder with stronger and more regular dorsal punctuation.

43  **Antiporus willyamsi.** A rare species restricted to acidic swamps in the lower South-east of South Australia and adjacent areas of Victoria. Recognized by its two-tone red and black colour and a large tuft of golden hairs at the base of the middle legs (armpits!) particularly in the males.
Hydrovatus opacus. The genus Hydrovatus has many species in tropical areas of the world including northern Australia. One specimen of this small, oval, strongly punctured species has recently been collected from the St Peters Billabong in Adelaide.

Hydrovatus rufoniger. A common species in tropical Australia and Islands further north, two specimens were collected from the Murray River at Tailem Bend in 1961. Recognized by its oval shape, uniform red colour and sparse dorsal punctuation.

Allodessus bistrigatus. A very common beetle over most of Australia west of the Great Dividing Range, found mostly, but not exclusively, in still water. Recognized by its small size and colour pattern which can be indistinct in some specimens. The sexes differ strongly in the colour of the abdominal segments (see Fig. 46). This is diagnostic for the species in the females although in some species of the genus Limbodessus (47-49) the females can also have a somewhat lighter abdomen than the males. Often confused with both Limbodessus shuckardii (47) and Limbodessus gemellus (48), particularly specimens of Allodessus bistrigatus with a poorly developed dorsal colour pattern. Apart from the black ventral surface they can only be separated by having more strongly punctured post coxal plates on the underside (Fig. 46) and by the shape of the male genitalia.

Limbodessus shuckardii. A relatively common species particularly in more arid regions such as the Flinders Ranges. Found at the sides of pools in creeks and rivers including underground among gravels at the edge of the water. Recognized by the curved grooves on the pronotum and, in most specimens, a darker area in the centre of the pronotum. Found in all southern states as well as southern Queensland. Can be confused with Limbodessus gemellus (46) and Allodessus bistrigatus (38) (see notes under those species).

Limbodessus gemellus. Rarer than Limbodessus shuckardii (46) with similar curved grooves on the pronotum. Found mainly in ponds and at the side of creeks. Difficult to separate from Limbodessus shuckardii (45) but lack the darker area in the centre of the pronotum present in most Limbodessus shuckardii. Dissection and examination of the male genitalia is required to confirm an identification. Can also be confused with Allodessus bistrigatus (38) (see notes under that species).

Limbodessus amabilis/L. praelargus. These two common species can only be separated by the form of the male genitalia requiring dissection (see Watts and Remko, 2005). Both species are common across south-eastern Australia in ponds, dams and wetlands. Recognized within group 9 species by the straight grooves on both the pronotum and at the base of the wing cases. May have an indistinct colour pattern.
Plate 11. Group 7. Small size (2.5 – 3.5mm. long), with variegated colour pattern on the dorsal surface.

All the species in this group are in the genus *Sternopriscus* which is characterised by motley coloured wing cases and, in most males, by the antenna having some expanded segments. Males also have a slight notch or indentation on the inside of the front legs (Fig 54b).

NB. Identification of the species of *Sternopriscus* is based on the form of the male antenna and, in one species, the form of the middle leg in the male. Most females cannot be identified to species. Males can be identified by the presence of a small notch on the inside of the front leg. All the illustrations are of males.

50 *Sternopriscus meadfootii*. Relatively common in pools and dams. Identified by having the central segments of the male antenna the largest (other than the apical one). Found in south-eastern Australia and Tasmania.

51 *Sternopriscus tasmanicus*. Perhaps the commonest species of *Sternopriscus* in South Australia occurring in most ponds and dams in the wetter areas of the State. Recognized by the large apical segment of the male antenna which noticeably narrows to a point. Can also be separated from *Sternopriscus wehnckeii*, the other South Australian species with a large apical segment to the male antenna, by the greater area of black on the head. Common in western Victoria and Tasmania.

52 *Sternopriscus multimaculatus*. A common species, particularly in ponds, dams and creeks in more inland areas. The only species which can be confidently identified by its dorsal colour pattern – numerous isolated small black spots. The male antenna is also not greatly different from that of the female. The sides of the pronotum in the female are noticeably sinuate. Found throughout the southern half of Australia including Tasmania.

55 *Sternopriscus clavatus*. Smaller than the other species in this group and not as common. Found mainly at the margins of ponds and dams in the Mt Lofty Ranges. Also occurs in coastal eastern Australia from north Queensland to Tasmania. Recognized by its size, elongate shape, colour pattern and, in the males, expanded antennal segments.

53 *Sternopriscus tarsalis*. Moderately common in ponds and dams in wetter areas of the State. Recognized by its elongate tarsi on the male middle legs when compared with the other species, together with having the apical segments of the antenna being larger than the central ones and a relatively small apical segment. Common in south-eastern Queensland, New South Wales, Victoria and Tasmania.
54 *Sternopriscus wehnckei*. Common in ponds, dams and creeks in wetter areas of the State. Males are recognized by the enlarged apical segment of the antenna which has a smoothly curved outside margin in contrast to that in *S. tasmanicus* (51). The amount of yellow on the head is also much greater in *Sternopriscus wehnckei* than in *S. tasmanicus* (51) but not necessarily more than in other species in the genus. Common in New South Wales and Victoria with records from the Atherton Tablelands.

55 *Sternopriscus clavatus*. Larger than the other species of *Sternopriscus* found in South Australia it is found mainly at the margins of ponds and dams in the Mt Lofty Ranges. Also occurs in coastal eastern Australia from north Queensland to Tasmania. Recognized by its size, elongate shape, colour pattern and, in males, strongly expanded antennal segments (Fig. 55a).

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**Further reading and references**


Checklist of Diving Beetles (Dytiscidae) recorded from South Australia (2014)

Genera in alphabetic order. Species in alphabetic order within genera

**Alloedessus** Guignot
  A. *bistrigatus* (Clark)

**Antiporus** Sharp
  A. *blakei* (Clark)
  A. *femoralis* (Boheman)
  A. *gilberti* (Clark)
  A. *willyamsi* Watts
  A. *wilsoni* Watts

**Chostonectes** Sharp
  C. *gigas* (Boheman)
  C. *nebulosus* (MacLeay)

**Cybister** Curtis
  C. *tripunctatus* (Olivier)

**Exocelina**
  E. *australiae* (Clark)
  E. *australis* (Clark)
  E. *ferruginea* (Sharp)
  E. *simplex* (Clark)

**Gibbidessus** Watts
  G. *chipi* Watts

**Hydrovatus** Motschulsky
  H. *opacus* Sharp
  H. *rufoniger* (Clark)

**Hyphydrus** Illiger
  H. *elegans* (Montrouzier)
  H. *lyratus* Swartz

**Hydaticus** Leach
  H. *chris* Nilsson

**Hydrodentes** Hope
  H. *shuckardii* Hope

**Lancetia** Sharp
  L. *lanceolatus* (Clark)

**Limbodessus** Guignot
  L. *amabilis* (Clark)
  L. *gemellus* (Clark)
  L. *praelargus* (Lea)
  L. *shuckardii* (Clark)

**Megaporus** Brinck
  M. *gardneri* (Clark)
  M. *hamatus* (Clark)
  M. *howitti* (Clark)
  M. *wilsoni* Mouchamps

**Necterosoma** MacLeay
  N. *dispar* (Germar)
  N. *penicillatum* (Clark)
  N. *undecimlineatum* (Babington)

**Onychohydrus** Schaum & White
  O. *scutellaris* (Germar)

**Paroster** Sharp
  P. *extraordinarius* Leys, Roundnew
  P. *gibbi* Watts
  P. *insculpultilis* (Clark)
  P. *nigroadumbratus* (Clark)
  P. *thapsinus* (Guignot)

**Platynectes** Regimbart
  P. *aenesescens* (Sharp)
  P. *bakewelli* (Clark)
  P. *decepmupunctatus* (Fabricius)
  P. *reticulosus* (Clark)

**Rhomatos** Dejean
  R. *suturalis* (W.S.MacLeay)

**Spencerhydus** Sharp
  S. *latecinctus* Sharp

**Sternopriscus** Sharp
  S. *meadfootii* (Clark)
  S. *multimaculatus* (Clark)
  S. *tarsalis* Sharp
  S. *tasmanicus* Sharp
  S. *clavatus* Sharp
  S. *wehnckeii* Sharp