Pictorial Guide to the Australian Whirligig Beetles

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Introduction

Whirligig beetles are a prominent feature of ponds, rivers and streams throughout Australia where swarms of them often attract attention by their rapid gyrations on the surface. The purpose of this guide is to enable the identification of adults of each of the Australian species and many of their larvae by means of a photographic illustration of each species and illustrations of a few important characters that, together with a location, we hope, will be enough to identify each species. We also have illustrated the larvae of three of the four basic Australian groups (Genera). No larva of the sole Australian member of the fourth group (genus Gyrinus) is known to us. For the larva of seven of the species in the genus Macrogyrus, illustrations of the head and first segment of the thorax just behind it are given. The colour pattern plus the location should be enough the enable many larvae to be identified. (Whirligig beetles have several larval instars or growth stage. What we have illustrated is the final stage. In most cases the colour pattern of the younger instars are similar but we have not investigated this well enough to rely on.)

The prime motivation for the guide was to enable interested individuals and water-care groups to identify the species living in their areas. Once named, a species can be talked about, literature sourced and general awareness and interest in our aquatic biology enhanced. Almost nothing is known of the microhabitat or the life histories of any of our species. Hopefully the guide will stimulate local interest and lead to the filling in of the huge gaps in our knowledge of individual species. Simple, systematic observations and recording of sightings and behavior would be a great first step.

This work is a first attempt at an easily assessable guide to the Australian whirligig beetles. It is based on the work of Georg Ochs (1949, 1956), the senior author’s fieldwork and our own study of the extensive collection of the South Australian Museum. Much has been learned about the Australian species since Ochs’ studies but no clearly new species have been discovered and his work remains sound. The guide will have flaws, in particular in distributions. We would be pleased if users could contact us with news of new discoveries, perhaps also with a specimen preserved in 70-80% ethanol or methylated spirits.

Life History and Biology

Adult beetles can be easily recognized by their unusual eyes which are completely divided, top and bottom, into two. When on the surface of the water the upper pair have an undisturbed view above the surface and the lower pair likewise below the water. In addition to their eyes, their streamlined form and stubby, paddle-shaped mid and back legs enable the rapid movement of the insects both on the surface and below.

Whirligig beetles have a life history with three larval stages (instars), a pupal stage and an adult stage. Eggs are laid on the surface of submerged vegetation. The larvae are long and thin and have lateral gills which absorb oxygen from the water. Because of this ability the larvae do not need to rise to the surface for air as do the larvae (and adults) of most other large water beetles. Much of their time is spent hunting among plant roots and debris at the
bottom of the water. In open water they swim strongly using a distinctive dolphin-like swimming motion. In comparison to their size their heads (and mouths) are relatively small suggesting that their prey is also relatively small. The senior author has reared larvae on blood worms (Chironomid larvae) and it is likely that these, or similar, insect larvae are a major food source. Most larvae collected are in their last instar, suggesting that most larval growth and time is spent in this instar as is the case in other aquatic beetles. When mature the larvae leave the water to pupate. The senior author has found pupae of *Macrogyrus australis* in small pupal cells built of mud, a little above the water line, attached to a cement pillar. Nothing more is known about the places where pupation takes place in Australian species.

Wherever there is relative permanent fresh water, whirligig beetles can be found. Mostly they favor still or slowly moving water such as ponds or pools in streams but some species e.g. *M. angustatus* in Western Australia, and *M. oblongus* and *M. striolatus* in eastern Australia can be found in rivers and streams although mainly in areas of slower water.

Whirligig beetles are strong fliers and, particularly the inland species, are often found near lights at night. Strong dispersal ability lets the inland species such as *M. gibbosus*, exploit scattered rock pools and pools in drying creek beds. In the north whirligig beetles are often the first to colonize newly filled swamps after the start of the wet. Most collections in the south are made in the warmer months. This may reflect the preference of collectors and it is not known whether the beetles remain active all year or become inactive in the cooler months or even if they are active at night.

Whirligig beetles by their relatively large size and abundance are an important ecological component of many water bodies, with both the larvae and adults important predators. Adults are insectivorous and feed on insects which they catch on the water surface often after they have fallen or been blown onto the surface. No studies have yet been done to quantify the role played by these beetles in aquatic ecosystems so their relative importance can only be speculated upon. Upwards in the food chain the beetles themselves are used as food by fish and birds, although the adult’s unique eyes and its ability to move erratically and rapidly must limit the extent they are predated upon and allow them the luxury of a very visible life on the water surface.

These beetles are seldom, if ever, found on other than unpolluted water bodies and appear sensitive to pollution, particularly surface pollution. Studies quantifying this are yet to be done but, on first principles, make the beetles seem useful and easily seen predictors of water quality.
Taxonomy/Identification

By world standards the whirligig beetle fauna of Australia is small with only 19 species in four genera: *Gyrinus*, *Dineutus*, *Aulonogyrus* and *Macrogyrus*. The species, *Gyrinus convexiusculus*, *Aulonogyrus strigosus*, *Dineutus australis*, *D. neohollandicus*, and *Macrogyrus australis* or closely related species, are found in much of South East Asia as well as Australia but, apart from *M. paradoxus* which probably occurs in Timor, and Borneo all other Australian species are found only in Australia (Ochs 1949). By far the most Australian species are in the genus *Macrogyrus* which has 15 species in Australia.

We have used the taxonomy of Ochs 1949 and 1956 as the bases of the work but have not followed his use of subspecies. Nor have we followed his subgenera of *Macrogyrus*. Since Ochs’ work many more specimens have become available for study and we feel that the distinctions between the subspecies, and many of the subgenera, identified by Ochs have become impossible to substantiate. A major study may come to a different conclusion but for the purpose of this guide we have ignored subspecies and subgenera. Also the distinction between some species recognized by Ochs has become blurred and would benefit from further study, in particular *M. oblongus* and *M. rivularis* but also *M. australis*, *M. angustatus* and *M. finschi* which are often hard to separate with confidence. We have not attempted to use the anatomy of the male genitalia as we find them both variable within a species and little different between species. Again a more thorough study may well come to a different conclusion: they are certainly differences between species in male genitalia that are likely to be useful in separating certain species.

The four Australian genera are morphologically distinctive and should be possible to recognize by the prompts on page 6. There are 15 Australian species in the genus *Macrogyrus*. Purely for ease of identification in this guide we have grouped them into 5 groups. These may or may not represent natural groupings. Within these groups species are mainly differentiated on size, locality and the strength and number of the longitudinal grooves on the wing cases (elytra).

Using the Guide

We think that it will be possible to identify all of the different Australian whirligig beetles from illustrations. To facilitate this we have grouped the species, firstly by the genus to which they belong (p. 6, ‘Identifying the genera”) and, secondly, for the 15 species in the genus *Macrogyrus*, by a couple of morphological characters and their distribution (p. 10, ‘Identifying groups within the genus Macrogyrus’). For easier comparison we have placed the illustrations of the member species in each group on a separate page. On the opposite page are notes on the species which include distinguishing characters and brief comments on their natural history.
## Identifying the Genera

1. Length less than 5.0 mm .................................................. *Gyrinus* see page 8.
   - Length greater than 6 mm ............................................. Go to couplet 2 below.

2. Without scutellum (see opposite page Fig. 1) .................. *Dineutus,* see page 8
   - With scutellum (see opposite page, Figs 2, 3) ............... Go to couplet 3 below.

3. Inner edges of wing cases with slightly raised border (see opposite page, Fig. 2).
   ................................................................. *Aulonogyrus* see page 8.
   - Inner edges of wing cases without slightly raised border (see opposite page, Fig. 3).
   ........................................................................ *Macrogyrus,* see page 9.
Identification of the genera

*Dineutus* (page 8)

1. Without scutellum

*Aulonogyrus* (page 8)

2. With scutellum
   - With raised margins to wing case

*Macrogyrus* (page 10)

3. With scutellum
   - Without raised margins to wing case
Species of the Genera *Gyrinus*, *Aulonogyrus* and *Dineutus*

*Gyrinus convexiusculus* MacLeay

*Distinguishing characters* At 3.5 – 4.8 mm long *G. convexiusculus* is the smallest of the Australian whirligig beetles, easily recognized within Australia by its small size, totally black colour and the inner edges of the wing cases with slightly raised borders.

*Distribution/habitat.* The beetles are most often seen in small to moderate sized groups in relatively shallow but extensive water bodies. Often these are flooded areas with a lot of emergent vegetation such as rushes and grasses. Most frequently seen up the east coast north of Brisbane, the species is also known from near Darwin, coastal New South Wales and occasionally from Victoria. There is a record of one specimen from Kangaroo Island in South Australia which needs to be confirmed. Outside of Australia it has been recorded from Ceylon, India, China, Sumatra, Java, New Zealand, and New Caledonia. It almost certainly also occurs in New Guinea.

The larva is not known, although there is a poorly preserved specimen in the South Australian Museum from north Queensland that properly is this species.

*Aulonogyrus strigosus* (Fabricius)

*Distinguishing characters* A relatively small beetle which is most easily recognized by the raised inner margins of the wing cases and the yellow margin to the prothorax.

*Distribution/ Habitat.* A common and widespread species found in a wide range of still water habitats – swamps, billabongs, dams and pools in slow flowing rivers and streams. It occurs in all states and territories except Tasmania but including Norfolk Island.

Larva known. See p. 23.

*Dineutus australis* (Fabricius)

*Distinguishing characters within Australian* Dineutus species. Weak spines at the tips of the wing cases; without yellow margins to the pronotum.

*Distribution/habitat.* Perhaps the commonest of Australian whirligig beetles, *D. australis* is found in dams, swamps, and pools in rivers and stream in all States and Territories except Tasmania. It also occurs in China, The Philippines, Indonesia, New Guinea, Vanuatu, New Caledonia, Fiji and other Pacific Islands.

Larva known. See p. 23

*Dineutus neohollandicus* Ochs

*Distinguishing characters within Australian* Dineutus species. Strong spines at the tips of the wing cases; yellow borders to the pronotum.

*Distribution/ Habitat.* A northern species found in dams, swamps and pools in rivers and streams in the Northern Territory, north Queensland and the northwest of Western Australia. There is one record from Victoria (Ochs 1956).

Larva not known.
Genus *Macrogyrus*

There are 15 Australian species within the genus *Macrogyrus*. To make recognition of the different species easier we have divided them into five groups based on easily seen characters. Illustrations of members of each group are placed together on one page. The species are grouped according to the presence or absence of yellow dorsal margins, the number of points on the tips of the wing cases and distribution. Other characters such as the number and strength of the longitudinal groves on the wing cases, body shape and the shape of the side portion of the metaventrite (Figs 9, 10) can be usefully in separating some species. It should be noted that in some species, notably *M. striolatus* and *M. rivularis*, the front legs of the male can be greatly elongate with strong sucker pads on their feet. This character is not specifically diagnostic and occurs in a number of species. The legs of the females are more normal in size. Larger individuals also tend to have disproportionately longer front legs. Thus the shape and size of the front pair of legs should be ignored when attempting an identification except were specifically mentioned (e.g. *M. venator*).

*The number and shape of the points on the tips of the wing cases (elytra)*. These vary from none to three and are consistent within a species (Fig. 8).

*Distribution*. Several species have limited distributions making their identification easier (see distribution maps beside the illustrations).

*Shape of the side portion of the metaventrite*. This structure is found on the underside just in front of the middle legs. It can range from elongate triangular (Fig. 9) to broadly triangular (Fig. 10) and was used by Ochs as one of his major characters to distinguish his groups but we find it difficult to see clearly and unreliable for differentiating most species. It is however useful for separating the species *M. reichei* and *M. howitti* (p.18) which are otherwise hard to separate.

**Identification of the different groups within the genus *Macrogyrus* used in this guide**

1. Body with yellow margins (Figs 11-13) .................................................................
   Group 1 (p. 13) (*M. darlingtoni*, *M. paradoxus*, *M. gouldi*).
   - No yellow margin to body ...................................................................................... go to 2

2. Tip of wing cases smoothly rounded with at most 1 weak point (Fig. 8) .................
   Group 3 (p.17) (*M. howitti*, *M. reichei*, *M. striolatus*).
   - Tip of each wing case sinuate (p. 15) or with three points (Fig.8) ...................... go to 3

3. Tip of each wing case sinuate (p.15)
   Group 2 (p.15)(*M. oblongus*, *M. viridisulcatus*, *M. rivularis*).
   - Tip of each wing case with 3 points (p. 20) ............................................................... go to 4

4. Found on Cape York, Queensland ..........................................................................
   Group 5 (p. 21) (*M. australis*, *M. elongatus*, *M. finschi*).
   - Not found on Cape York, Queensland ..................................................................... Group 4 (p.19) (*M. australis*, *M. gibbosus*, *M. venator*, *M. angustatus*)
**Macrogyrus**

8  0-1 point

Three points per wing case

9  a > b

10  a = b
**Macrogyrus group 1**

*Macrogyrus darlingtoni* Ochs

*Distinguishing characters within group 1 species.* Close to *M. paradoxus* but longer (7 – 8mm long), stouter and usually with a weak middle point at the tip of the wing case.

*Distribution/Habitat.* Ponds and pools in rivers and streams in forested areas of coastal Queensland.

*Macrogyrus paradoxus* Regimbart

*Distinguishing characters within group 1 species.* Smaller (6 – 7 mm long) and narrower than the very similar *M. darlingtoni* with little or any suggestion of a weak middle point at the tip of the wing case as is usually present in *M. darlingtoni*.

*Distribution/Habitat.* Found in pools in rivers from the Pilbara region of Western Australia to coastal regions of the Northern Territory and North Queensland. Also recorded from Timor.

*Macrogyrus gouldi* (Hope)

*Distinguishing characters within group 1 species.* Resembles both *M. darlingtoni* and *M. paradoxus* in size, shape and colour but readily separated by the strong spines on the tips of the wing cases.

*Distribution/Habitat.* Ponds and pools in rivers and streams in coastal Northern Territory.
Macroyrus group 1 species

With yellow margins

13  
M. gouldi

M. darlingtoni

M. paradoxus
**Macrogyrus group 2**

**Macrogyrus oblongus** Boisduval

*Distinguishing characters within group 2 species.* Length 11-13 mm. Generally smaller and more elongate than the closely similar *M. rivularis* and with the inner 2 – 3 striae on the wing cases usually easily traceable. Best separated from the northern *M. viridisulcatus* by distribution. There is considerable variation in the length of the front legs between individuals; larger males tend to have disproportionally longer legs. Compare the illustration of *M. oblongus* (relative small male) with that of *M. viridisulcatus* (large male). *Distribution/Habitat.* A relatively common species in ponds and slower reaches of small rivers and streams in coastal, forested regions of southern Queensland, New South Wales, and Victoria. Also in The Australian Capital Territory. Larva known. (See p. 25.)

**Macrogyrus rivularis** (Clark)

*Distinguishing characters within group 2 species.* Separated from *M. oblongus* by having the inner 3 – 4 striae on the wing cases weakly marked and hard to trace. Possibly a southern form of the more widespread *M. oblongus.*

*Distribution/Habitat.* A relatively rare species in slower reaches of small streams in wetter forested regions of south east Australia.

**Macrogyrus viridisulcatus** Mjobergi

*Distinguishing characters within group 2 species.* Striae on elytra much stronger than in *M. rivularis.* Very similar to the more southern *M. oblongus* and possibly a northern form of that species. Best distinguished by its northern distribution and strong coppery striae.

*Distribution/Habitat.* Found in pools and slower reaches of rivers and streams in forested areas in the Cairns/Atherton region of north Queensland as well as from Groote Eylandt in the Northern Territory.

Larvae known. (See p. 25.) The specimen photographed was kindly lent to us by the late Ross Storey of the Queensland Department of Primary Industries, Mareeba.
Macrogyrus group 2 species

M. oblongus

M. rivularis

M. viridisulcatus
Macrogyrus group 3

Macrogyrus striolatus (Guerin-Meneville)

*Distinguishing characters within group 3 species.* Larger (15 – 18 mm long) and broader than *M. howitti* and virtually lacking any striae on the wing cases.

*Distribution/Habitat.* Pools and slower reaches of rivers and streams in forested areas of New South Wales and southern Queensland. Much less common than the similarly large *M. oblongus* (group 2) which occurs in the same general habitat.

Larva not known.

Macrogyrus howitti (Clark)

*Distinguishing characters within group 3 species.* Smaller (10 – 13 mm long) and more elongate than *M. striolatus* and with 1 – 2 weakly impressed outer striae on each wing case. From *M. reichei* it is best separated by its more equilaterally shaped side portion to the metaventrite. (See Fig. 10.)

*Distribution/Habitat.* Ponds and pools in rivers and creeks in woodland areas of New South Wales, Victoria, South Australia and Tasmania. Much more common in Tasmania than on the mainland where it is rarely collected.

Larva known. (See p. 25.)

Macrogyrus reichei (Aube)

*Distinguishing characters within group 3 species.* Smaller (9 – 12 mm long) and more elongate than *M. striolatus*. From the similarly sized *M. howitti* it is best separated by the more elongate triangular shape to the side portion of the metaventrite (Fig. 9).

*Distribution/Habitat.* Slower parts of rivers and streams in forested areas of South Australia, Victoria and southern New South Wales. Much commoner in South Australia than in Victoria and New South Wales where it appears to be rare.

Larva known. (See p. 25.)
Macrogyrus group 3 species

M. striolatus

M. reichei

M. howitti
**Macrogyrus group 4**

*Macrogyrus gibbosus* Ochs

*Distinguishing characters within group 4 species.* Quite closely resembling the more southerly *M. australis* from which it can be separated by its distinctly domed profile and usually weaker inner striae on the wing cases. It differs from the more northerly *M. venator* by its shorter front legs in both sexes and strongly impressed lateral striae on the wing cases. With a much broader and deeper body shape than *M. angustatus*.

*Distribution/Habitat.* The dominant whirligig beetle in rock pools and pools in riverbeds in central Australia west to the Pilbara in Western Australia.

Larva known. (See p. 25.)

*Macrogyrus australis* (Brulle)

*Distinguishing characters within group 4 species.* Similar to the more westerly *M. gibbosus* except for a flatter profile and more strongly marked inner striae on the wing cases in most specimens, and from *M. venator* by the presence of well marked striae on the wing cases. From *M. angustatus* it can be separated by its more oval shape with the widest point being at or behind the middle and the usually stronger striae on the wing cases.

*Distribution/Habitat.* The most abundant and widespread species of *Macrogyrus* in Australia, found in Queensland, New South Wales, Victoria and South Australia, often in large swarms in ponds and slower water in rivers and streams. Usually in relatively open sclerophyl or savannah woodland. Not often found in heavily shaded areas.

Larva known. (See p. 25.)

*Macrogyrus venator* (Boisduval)

*Distinguishing characters within group 4 species.* Separated from the more southern *M. gibbosus* by its flatter body and longer front legs and from *M. australis* by having the inner 3 – 4 striae on each wing case scarcely traceable as well as longer front legs. Much broader body shape than *M. angustatus*.

*Distribution/Habitat.* Found sparingly across northern Western Australia and the Northern Territory with the most easterly record from the Wellesley Islands in Queensland. Found in rock holes and pools in small creeks.

*Macrogyrus angustatus* Regimbart

*Distinguishing characters within group 4 species.* Very similar to *M. australis* and hard to confidently distinguish in eastern Australia where both species occur. Generally more elongate, with sides more parallel and slightly pinched inwards just behind the base of the wing cases. The striae also tend to be weaker than in *M. australis*. More elongate than the more northern *M. gibbosus* and *M. venator*.

*Distribution/Habitat.* The only *Macrogyrus* in the southwest of Western Australia, *M. angustatus* is also found, less commonly, in New South Wales and Victoria. There is one old record from Tasmania in the South Australian Museum. In Western Australia, at least, it is found in rivers and streams in forested country.

Larva known (See p.25.)
Macrogryrus group 4 species

20. M. gibbosus

21. M. venator

22. M. australis

23. M. angustatus
**Macrogyrus group 5**

**Macrogyrus elongatus** Regimbart

*Distinguishing characters within group 5 species.* Differs from both *M. finschi* and *M. australis* by the micro sculpture on the wing cases being in the form of very fine, elongate, irregular, meshes which can only be seen under strong magnification (Fig. 24). Also differs from *M. australis* by the very weak inner 3 – 4 striae, much stronger apical points on the wing cases and a generally shiner surface. It is a bit broader than *M. finschi* and with stronger elytral points.

*Distribution/Habitat.* A little known species from coastal north Queensland. Found in small closed-forest streams.

**Macrogyrus finschi** Ochs

*Distinguishing characters within group 5 species.* Separated from *M. elongatus* by the micro sculpture on the wing cases being in the form of rounded meshes (Fig. 25) and somewhat weaker points on the wing cases, and from *M. australis* by having only the outer 3 – 4 striae visible, at least in part, on each wing case and the inner 3 – 4 striae completely obliterated. The apical points on the wing cases are somewhat stronger than those on most *M. australis*.

*Distribution/Habitat.* A little known species from the Torres Strait Islands and adjacent mainland. Habitat not known.

**Macrogyrus australis** (Brulle)

*Distinguishing characters within group 5 species.* Separated from *M. elongatus* by the micro sculpture on the wing cases in the form of rounded meshes (Fig. 26) and from *M. finschi* by having all 7 striae on each wing case traceable to at least some degree. The points on the wing cases are somewhat weaker than in the other two species in the group.

*Distribution/Habitat.* The most abundant and widespread species of *Macrogyrus* in Australia, found in Queensland, New South Wales, Victoria and South Australia, often in large swarms in ponds and slower water in rivers and streams. Usually in relatively open sclerophyl or savannah woodland. Not often found in heavily shaded areas.

Larva known. (See Fig. 25.)
Macrogyrus group 5 species

Cape York Peninsula

M. elongatus

M. finschi

M. australis
Larvae

The larvae of not all species are known but enough of them are known to make it worthwhile to include them in this guide. The larvae of the only Australian species of the genus *Gyrinus* is not yet known although a key to its identification is given in Watts (2002) based on overseas specimens. Mature larvae of this genus will be much smaller than other Australian species with a head width not likely to be more than 0.5 mm. Larvae of the remaining three genera can be recognized by the following key.

**Key to genera based on larvae**

1. – Lateral gills short (Fig. 27) .............................................. *Aulonogyrus strigosus*
   – Lateral gills long (Figs 28, 29) ........................................... go to couplet 2 below

2. – Segment behind head (prothorax) short, square (Fig. 28); front margin of head with one tooth (Fig. 28) ................................................................. Species of *Dineutus*
   – Segment behind head (prothorax) longer, rectangular (Fig. 29); front margin of head with four teeth (Fig. 29) ................................................. Species of *Macrogyrus*.

*Aulonogyrus*

The larva of the only species, *A. strigosus*, is known (Fig. 27).

*Dineutus*.

The larva of *D. australis* is known (Fig. 28). The larva of the northern *D. neohollandicus* is not yet known.

*Macrogyrus*

The larvae of seven species of *Macrogyrus* are known. The colour pattern on the head and prothorax of each of these differs and it can be used to help identify the species. Illustrations of individuals in the last of the three larval stages are given on page 25. It should however be noted that not much is known about variation in colour pattern between the three larval stages nor between different populations so identifications need to be made with caution. Usually however the differences are clear enough to distinguish between the limited number of possible species living in a particular locality.

NB. Only last stage larvae are illustrated. The larva of none of the smaller (< 9 mm long) northern species is known. Of the species with adults > 9 mm long the larvae of *M. strigosus*, *M. rivularis* and *M. elongatus* are not known. The first two are relatively common in coastal, forested areas of southeastern Australia (together with *M. oblongus*) so care needs to be taken in assigning larvae with > 1.2 mm head width to species in this area.
Larvae -- Identification of genera

27  Aulongyurus strigosus  28  Dineutus australis  29  Macrogyrus gibbosus
Larvae of *Macrogyrus*

(Elongate pronotum, front of head with four teeth)

*Macrogyrus australis* (Fig. 30). Head width 1.0 – 1.2 mm.; pronotum and head with central dark panel variably shaped. How larva identified. Reared to adult.

*Macrogyrus howitti* (Fig. 32). Head width 1.1 – 1.2 mm.; pronotum with central and lateral darker panels; head with dark area widening towards front. How larva identified. Distribution (p.17), association with adults.

*Macrogyrus gibbosus* (Fig. 33). Head width 1.2 mm.; pronotum with narrow central dark panel; head with dark panel, tending darker behind. How larva identified. Distribution (p.19), association with adults.

*Macrogyrus oblongus* (Fig. 34). Head width 1.5 mm.; pronotum with extensive dark area; head dark in apical half. How larva identified. Distribution (p.15), relative size, association with adults.

*Macrogyrus viridisulcatus* (Fig. 35). Head width 1.3 – 1.4 mm.; pronotum dark; head dark. How larva identified. Distribution (p.15), relative size, elimination.

*Macrogyrus angustatus* (Fig. 31). Head width 1.0 mm.; pronotum with dark central area; head with dark central area weakening towards front. How larva identified. Distribution (p.19), association with adults, elimination.

*Macrogyrus reichei* (Fig. 36). Head width 1.0 – 1.1 mm.; pronotum without dark central panel, head with dark central area bilobed. How larva identified. Distribution (p.17), elimination, association with adults.
Macrogyrus

Heads and pronota of the larvae of seven species of the genus *Macrogyrus*
Specimens of larvae photographed came from the following localities

*Aulonogyrus strigosus*. Campaspe basin, Wild Duck Creek, Victoria.

*Dineutus australis*. 5 Km SW Mareeba, Queensland. Collected by D. Larson.

*Macrogyrus australis*. 10 Km N Coonawarra, South Australia.

*Macrogyrus angustatus*. Lake Poorinup, Western Australia.

*Macrogyrus gibbosus*. Kutjutana Waterhole, Western Australia.

*Macrogyrus viridisulcatus*. Tinaroo Reservoir Kauri Creek, Queensland. Collected by D. Larson.

*Macrogyrus reichei*. Broughton River, South Australia.

*Macrogyrus howitti*. Lake St Clair, Tasmania.

*Macrogyrus oblongus*. 3 Km E Cunningham Gap Qld.

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References


Checklist and suggested common names

*Aulongyrus strigosus* (Fabrici). Striped whirligig

*Dineutus australis* (Fabrici). Australian dineutus
*Dineutus neohollandicus* Ochs. Yellow-sided dineutus

*Gyrinus convexiusculus* Macleay. Petite whirligig

*Macroyrus australis* (Brulle). Common whirligig
*Macroyrus darlingtoni* Ochs. Darlington’s whirligig
*Macroyrus angustatus* Regimbart. Elongate whirligig
*Macroyrus elongatus* Regimbart. Shiny whirligig
*Macroyrus finschi* Ochs. Finsch’s whirligig
*Macroyrus gouldi* (Hope). Gould’s whirligig
*Macroyrus gibbosus* Ochs. Humped whirligig
*Macroyrus howitti* (Clark). Howitt’s whirligig
*Macroyrus oblongus* (Boisduval). Grooved whirligig
*Macroyrus paradoxus* Regimbart. Paradoxical whirligig
*Macroyrus rivularis* (Clark). Forrest whirligig
*Macroyrus reichi* (Aube). Reich’s whirligig
*Macroyrus striolatus* (Guerin). Smooth whirligig
*Macroyrus venator* (Boisduval). Broad whirligig
*Macroyrus viridisulcatus* Mjoberg. Coppery whirligig