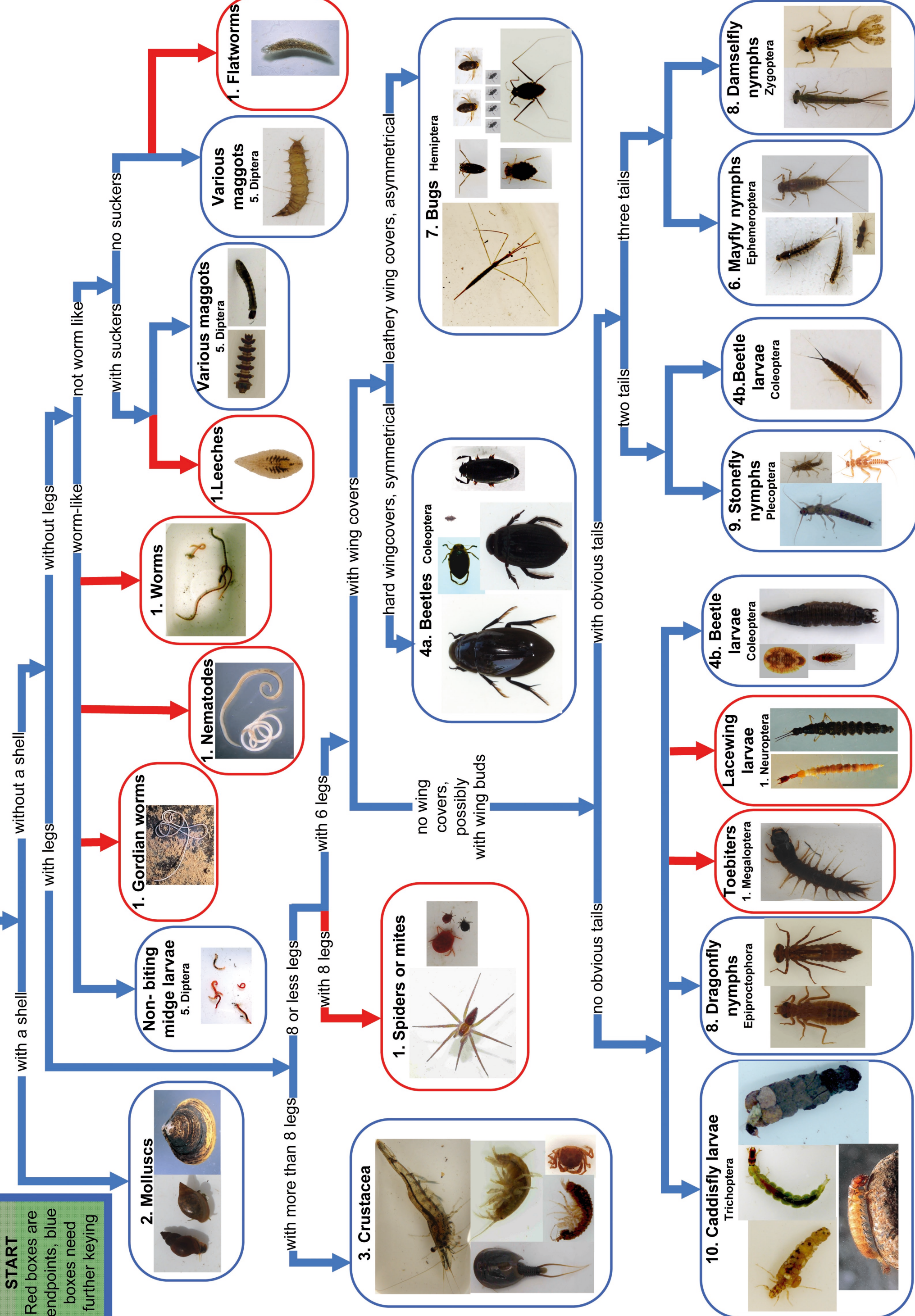


ALT KEYS v1.5



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START
Red boxes are endpoints, blue boxes need further keying



1. **ALT Animals without keys (this is as far as they go)**
2. **ALT Key to freshwater snails and mussels (Mollusca)**
3. **ALT Key to Crustaceans (Crustacea)**
- 4a. **ALT key to Adult Beetles (Coleoptera)**
- 4b. **ALT Key to Beetle Larvae (Coleoptera)**
5. **ALT Key to True Fly Larvae**
6. **ALT Key to Mayflies (Ephemeroptera)**
7. **ALT Key to True Bugs (Hemiptera)**
8. **ALT Key to Dragonflies and Damselflies (Odonata)**
9. **ALT Key to Stoneflies (Plecoptera)**
10. **ALT Key to Caddis Fly Larvae (Trichoptera)**

Using the ALT keys

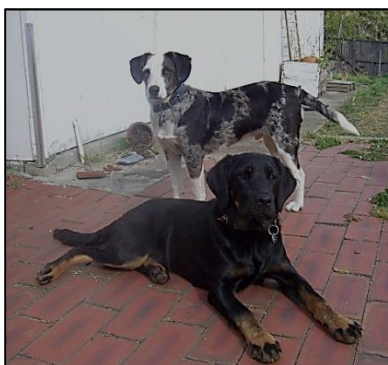
To use an ALT key properly, you need to follow the directions given by each couplet until you get to an end point (with a red border). The fictitious example below demonstrates how couplet 1 is linked to couplet 2 if you have a four legged animal you are identifying, but couplet 3 if you have some sort of insect.

| | | |
|-------------------|--------------------|-----|
| start 1 | animal with 6 legs | → 3 |
| | animal with 4 legs | → 2 |

| | | |
|--------------------------------|--|----------------------------------|
| couplet number 2 (1) | Animal covered in fur, can be fast moving. | miniature dogs (Microcanidae) |
| | Animal made of wood or metal, rarely moving, can be covered in layers of camouflage. | table (Furnituridae) |

The number in brackets refers to the original couplet. This is provided in case you need to go back through the key and change an answer. When you get to a red box in the key, this is an end point, and there will be a description of the animal that follows. Common names are used throughout the text, but they are usually accompanied by scientific names. Families end in 'ae' and genus and species names are in italics.

Family Microcanidae (miniature dog)




Size: up to 20mm




Habitat: Parasitic on humans

Movement: Can be fast moving, but often found asleep.

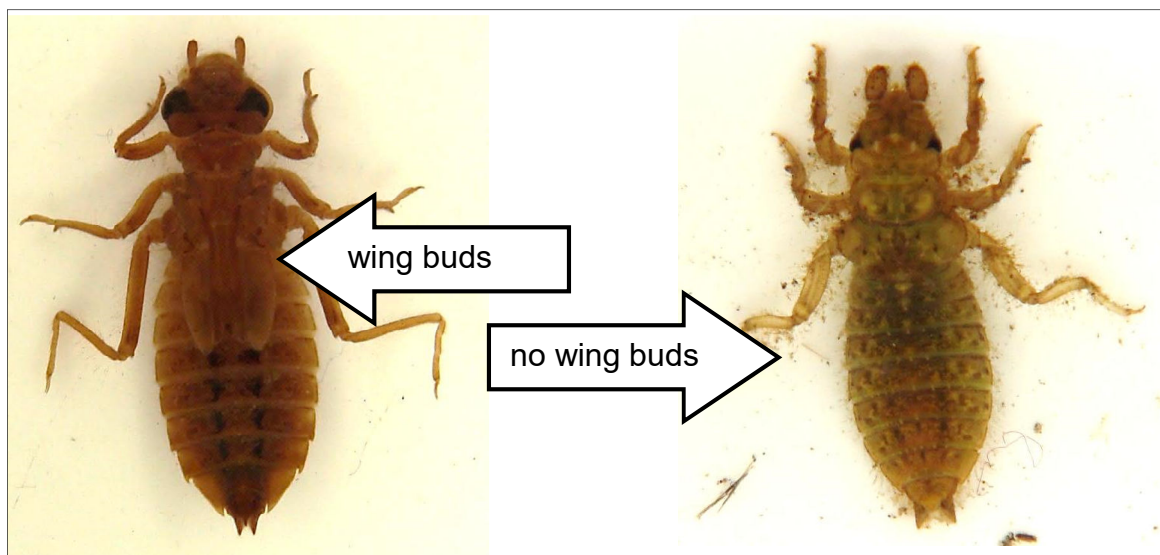
ALT Symbols

The **magnifying glass symbol**  means that you will need a magnifying glass (also called a hand lens) to check for some of the features described in the text.

Green squares  give you an idea of the maximum size of an animal. Most of these animals can start off life as little eggs, so it isn't useful to give a minimum size. Generally speaking look for wings or wing buds in the following groups as an indication of maturity: Dragonflies and Damselflies (Odonata), True bugs (Hemiptera), Mayflies (Ephemeroptera) and Stoneflies (Plecoptera). In the three examples of blond sprawler (Family Gripopterygidae, genus *Illiesoperla*) below, the oldest nymph is on the left. The yellower one (central) has probably just moulted.



Other groups will have a larval stage without wings or wing buds, so it can be harder to tell if they are mature or not. The two pictures below are different gomphids. The one on the left is considerably older from the size of its wing buds. These will eventually develop to the stage where you can see some of the venation of the adult wing through the surface of the wing bud, just before they emerge and fly off.



Unidentified animals. In some cases, it will not be possible to identify animals. This is perfectly reasonable, particularly if the animals are small, immature, or damaged. We have taken this into account with the way we use the data. If you consistently find an animal that you recognise, but cannot identify, it is worthwhile preserving a specimen and getting it identified later.

Agreed Level Taxonomy (ALT) keys

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1. ALT Animals without keys (this is as far as they go)

Phylum Nematomorpha, (gordian worms)



Size: Up to 50mm, but very thin, like wire.

Habitat: Rivers.

Movement: Very slow and deliberate coiling and uncoiling.

Confused with: Wire or thread.

Phylum Nematoda, (roundworms)



Size: Up to 5mm. ■

Habitat: Rivers, wetlands, all habitats in sediment.

Movement: Thrashing, coiling and uncoiling.

Confused with: Gordian worms, which are much larger.

Class Oligochaeta, (worms)



Size: Up to 10cm.

Habitat: Rivers, wetlands, in sediment.

Movement: Like an earthworm. Smaller worms may swim by wriggling.

Confused with: Leeches, but worms have no suckers.

Class Hirudinea, (leeches)



Size: Up to 10cm stretched out, but smaller when contracted.

Habitat: Rivers, wetlands.

Movement: Characteristic looping motion, elongation and contraction of body.

Confused with: Worms, flatworms, which don't have suckers.

Phylum Turbellaria, (flatworms)



Size: Up to 20mm.

Habitat: Rivers, wetlands.

Movement: Slow glide.

Confused with: Leeches, but flatworms have no suckers and move differently.

Order Araneae, Family Pisauridae and Family Lycosidae (fishing and wolf spiders)



Size: Leg span to 120mm.

Habitat: Edges of rivers and wetlands.

Movement: Running rapidly on the surface, then crawling underwater leaving a silvery layer of air trapped against the body.

Confused with: Terrestrial spiders, which cannot do the air layer trick or run on water as effectively.

Order Acarina, (water mites)



Size: Up to 5mm.

Habitat: Rivers, wetlands.

Movement: Very active swimmers, legs move very fast.

Confused with: Nothing else is as colourful.

Order Megaloptera, Family Corydalidae (toebiters)



Size: Up to 35mm.

Habitat: Fast flowing stony rivers.

Movement: Slow deliberate crawl.

Confused with: Gyrinid and Hydrophilid beetle larvae, which are much smaller and are not found in fast flowing rivers.

Order Megaloptera, Family Sialidae (sialids)



Size: Up to 35mm.

Habitat: Wetlands and pools rivers.

Movement: Slow deliberate crawl.

Confused with: Gyrinid and Hydrophilid beetle larvae, which are much smaller and are not found in fast flowing rivers.

Order Neuroptera (lacewings)



Size: Up to 20mm.

Habitat: Fast flowing streams.

Movement: Either very fast (Top), or very (lower) slow with

oil-slick, rainbow-coloured, water-repellent skin.

Confused with: Beetle larvae, but lacewings often have a distinct neck and their jaws are longer and straighter.

Order Lepidoptera (aquatic caterpillars)



Size: Up to 12mm.

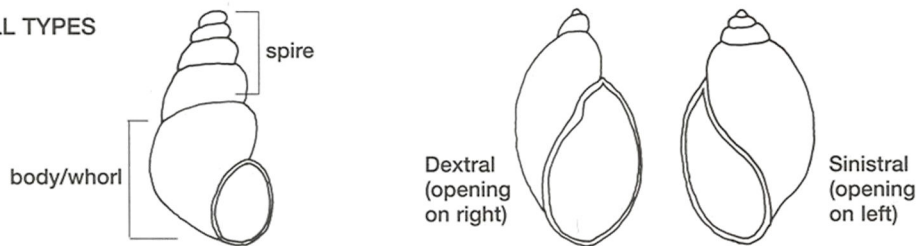
Habitat: still or slow flowing.

Movement: Slow moving, sometimes Will undulate the abdomen to aerate their gills.

Confused with: Nothing, very distinctive once you have noticed the gills on the abdomen, and the dodgy build quality of the case construction.

2. ALT Key to freshwater snails and mussels (Mollusca)

SHELL TYPES



| | | |
|---|--------------------------------------|---|
| 1 | Animals look like snails or limpets. | 3 |
| | Animals look like mussels. | 2 |

| | | |
|-------|--|--|
| 2 (1) | Shell halves are large (longer than 25 mm), dark, thick and usually not symmetrical. | freshwater mussels Family Hyriidae |
| | Shell halves are small (less than 25 mm); light coloured, relatively thin and symmetrical. | basket and pea shells Family Sphaeriidae and Family Corbiculidae |

Family Hyriidae (freshwater mussels)



Size: Up to 120mm.

Habitat: Often found in groups, almost completely dug into the sandy bottom of slow flowing rivers.

Movement: Not really.

Confused with: Nothing, very distinctive.

Family Sphaeriidae and Family Corbiculidae (basket and pea shells)



Size: Up to 25mm.



Habitat: Flowing and still waters, usually amongst sand or finer sediments. Can be found in large numbers. Common.

Movement: Usually doesn't.

Confused with: Small Hyriidae, but Hyriidae are usually asymmetrical and much larger.



| | | |
|-------|----------------------------|---|
| 3 (1) | Animals look like snails. | ➔ 4 |
| | Animals look like limpets. | freshwater limpets Family Ancyliidae |

Family Ancyliidae (freshwater limpets) -



Size: Up to 4mm.



Habitat: Both still and flowing waters, on rocks or vegetation. Common.

Movement: Very slow. Can stick to the sorting tray, so they are worth checking for after a live-pick once you have tipped the rest of the sample out.

Confused with: Nothing, but they can be very small and the shell can be transparent so they are sometimes hard to see.

| | | |
|-------|---|-----------------------------------|
| 4 (3) | Snails with flat shells. | flat snails Family Planorbidae |
| | Shells are not flat, have normal spire. | → 5 |

Family Planorbidae, various genera (flat snails)




Size: 6mm. ■

Habitat: Wetlands / Rivers, temporary waters.

Movement: Slow, will retract into shell and drop off vegetation, so it is sometimes worth panning through sand at the end of a live pick to see if you can find them.

Confused with: Nothing, really distinctive.

Etymology: 'plan'-flat + 'orbi'-circle.

| | | |
|-------|--|---|
| 5 (4) | Snails are coiled small (less than 10 mm), often jet black with dextrally (see illustration) coiled shell and a black disk (operculum) on the foot used for shutting the shell. This can be hard to see without magnification. |  Family Hydrobiidae Species <i>Potamopyrgus antipodarum</i> |
| | Snails not as above. | → 6 |

**Family Hydrobiidae - Species *Potamopyrgus antipodarum*
(New Zealand mud snails)**





Size: Up to 4mm. ■

Habitat: In very large numbers in impacted, high nutrient streams.

Movement: Slow, like a snail.

Confused with: Some snails from the same family in healthy streams, see Genus *Beddomeia*, family Hydrobiidae, at the end of this section.

INTRODUCED SPECIES (from New Zealand)

| | | | |
|--------------|---|--|---|
| 6 (5) | Shell sinistral (left handed) or footed |  <p>Sinistral (opening on left)</p> | <p style="color: blue;">➔</p> <p>7</p> |
| | Shell dextral (right handed) |  <p>Dextral (opening on right)</p> | <p>Family Lymnaeidae</p> |

Family Lymnaeidae (lim nay ids)



Size: 12 - 40mm.

Habitat: Wetlands / slower lowland rivers.

Movement: Snail's pace.

Confused with: Nothing, most other dextral snails are much smaller.

Lymnaeids can be mottled but they are dextral so they cannot be confused with *Physa acuta*.

| | | | |
|-------|---|--|---|
| 7 (6) | Mottled pattern visible through the shell. You might need good light to see this. |  | Family Physidae species <i>Physa acuta</i> |
| | Snail without obvious mottling. | | Family Planorbidae |

Family Physidae, Species *Physa acuta* (marbled menace)



Size: Up to 10mm. ■

Habitat: Flowing water or wetlands widespread.

Movement: Fast... for a snail.

Confused with: Planorbids can look very similar, but *Physa acuta* has a mottled mantle that is usually visible through the shell.

INTRODUCED SPECIES
(from the USA)

Family Planorbidae, various genera (planorbids)



Size: Up to 15 mm. ■

Habitat: Wetlands / rivers with slow water and lots of water plants. Common and diverse.

Movement: Slow and steady.

Confused with: Algae covered shells might be difficult to distinguish from *Physa acuta*. These Snails are fairly diverse, so they might not look exactly the same as those in the picture; some have ornamentation or flattened tops.



Other snails encountered in Australia (Rarer than those in the keys).

Family Pomatiopsidae, Genus *Coxiella* (salt lake snails)



Size: Up to 8mm. ■

Habitat: Salt lakes of Western Victoria.

Family Hydrobiidae, Genus *Beddomeia*



Size: Up to 5mm.

Habitat: cold, fast flowing rocky streams.

Family Viviparidae, Genus *Notopala*

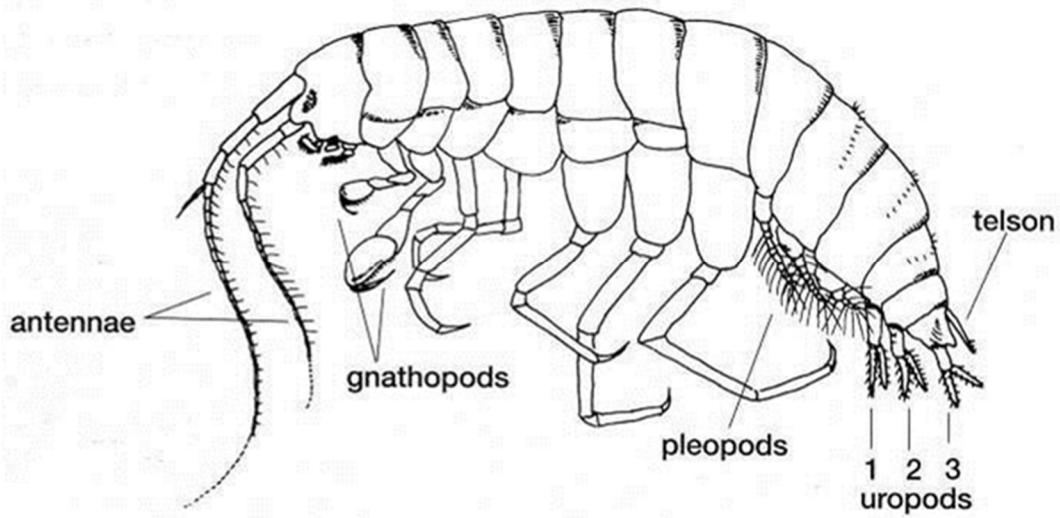


Size: Up to 20 mm. ■

Habitat: Pools of the lower Murray.

(Photo: Kathryn Storey)

3. ALT Key to Crustaceans (Crustacea)



An example amphipod

BEFORE YOU START:

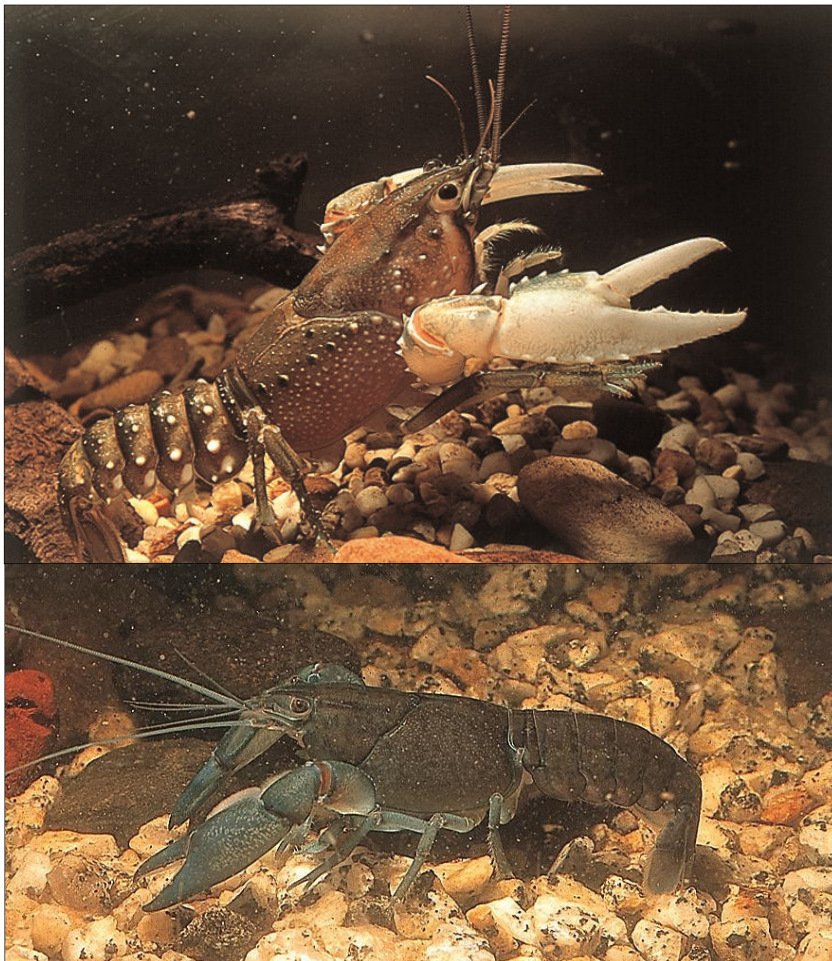
Crustaceans can vary in size quite a lot. Large freshwater crayfish start life smaller than 5mm, so be aware that the sizes in this section all refer to maximum length.

Many of the larger crustaceans can be recognised by their distinctive shapes and often we are familiar with them because their less fortunate relatives feature on restaurant menus. Yabbies, shrimp and shield shrimp are simpler to recognise from pictures than descriptions so the first part of the following key introduces the larger, commoner crustaceans you are likely to find.

NB: Families end in 'ae' and genus and species names are in *italics*.

| | | |
|---|--|---|
| 1 | Robust animals, freshwater crayfish or yabbies with obvious front pincers, movement walking or sometimes 'flips' of the tail that propel the animal backwards. | freshwater crayfish or yabbies Family Parastacidae |
| | Not as above. | → 2 |

Family Parastacidae (freshwater crayfish or yabbies)



Size: Up to 30cm.

Habitat: Crayfish in rivers (upper photo) yabbies in wetlands/pools (lower photo).

Movement: walking, with sudden flips when disturbed.

Confused with: Nothing, very distinctive. We have left crayfish and Yabbies grouped together because they mostly turn up as juveniles in samples and are difficult to separate when young.

| | | |
|-------|--|-----|
| 2 (1) | Shrimp or prawn-like animals (see pictures below). | ➡ 3 |
| | Not as above. | ➡ 4 |

| | | |
|-------|---|--|
| 3 (2) | Second leg with pincers and noticeably longer than others. Body translucent/opaque. | freshwater prawn Family Palaemonidae |
| | Transparent (or at least translucent) front pairs of legs similar sized. | glass shrimp Family Atyidae, various genera |
| | Pale stripe along back | GT shrimp Family Atyidae, Genus Australatya |

Family Palaemonidae, Genus *Macrobrachium* (freshwater prawns)



Size: to 50mm (image roughly 1/2 size.)

Habitat: Lowland rivers on wood or amongst water weeds.

Movement: Walking, flips in shallow water.

Confused with: Atyidae, but pincers on second leg very distinctive when fully grown.

Family Atyidae (glass shrimp)



Size: Up to 35mm

Habitat: slow moving parts of rivers near wood and weeds. Common and often abundant.

Movement: Fast, with lots of flipping when in a tray.

Confused with: Palaemonidae, but front 2 pairs of Atyidae legs are shorter and usually with brushes.

Family Atyidae, Genus *Australatya* (GT shrimp)



Size: Up to 45mm

Habitat: fast moving parts of rivers. Common and often abundant.

Movement: Fast, with lots of flipping when in a tray.

Confused with: Palaemonidae, but front 2 pairs of Atyidae legs are shorter and usually with brushes.

| | | |
|-------|---|--|
| 4 (2) | Round body, slow-moving, obviously crab-like (see image). | five cent crab / false spider crab Family Hymenosomatidae |
| | Not as above. | → 5 |

Family Hymenosomatidae (five cent crabs, false spider crabs)



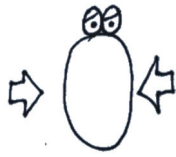
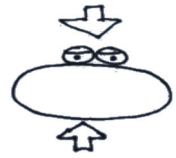
Size: Up to 15mm.



Habitat: Lakes, and the sluggish, estuarine ends of rivers.

Movement: Slow.

Confused with: Nothing. Very distinctive.

| | | | |
|-------|---|--|-----|
| 5 (4) | Animals strongly flattened from the sides (like dogs and cats); often lying on their side or moving with their side flat against the substrate. |  | → 6 |
| | Animals not flattened or flattened 'front to back' (like humans or cockroaches). |  | → 7 |

| | | |
|-------|--|---|
| 6 (5) | Animal rests on its side, swims in swift bursts (below left). | sideswimmers or scuds Order: Amphipoda |
| | Animal slow moving, walks (below right), relatively robust looking animal, bovine. | phreatoicids, cow shrimp Order: Isopoda Family: Phreatoicidae |



Order Isopoda, Family Phreatoicidae, (phreatoicids, cow shrimp)



Size: Up to 25mm (Image roughly life size).

Habitat: Wetlands. Rivers. Usually not common but can occur in large numbers.

Movement: Slow walking.

Confused with: Amphipods, but they are far more robust looking and slow moving.

Order Amphipoda (scuds, sideswimmers)



Size: Up to 15mm. ■

Habitat: Wetlands. Weeds in slower parts of rivers, or leaf packs in faster rivers. Very Common.

Movement: Bursts of movement, usually on their sides.

Confused with: Phreatoicids, but faster.

| | | |
|-------|---|---|
| 7 (5) | Small, pale (white to light brown or grey) crustacean, final segments as broad or broader than head, slow moving and slater-like. | janirids Order: Isopoda Family: Janiridae |
| | Not as above. Temporary wetlands support some impressive crustaceans, the next three groups are more readily identified from photos than descriptions. They are listed rather than keyed. | Browse the gallery on the following pages. |

Order Isopoda, Family Janiridae (water slaters)



Size: Up to 7mm. ■

Habitat: Wetlands and river edges. Rare.

Movement: Slow.

Confused with: If terrestrial slaters fall in they look similar. Can be extremely small.

another isopod that is distinctive

Order Isopoda, Family Sphaeromatidae (sphaeromatids)



Size: Up to 12mm. ■

Habitat: Lower ends of rivers

Movement: Fast bursts of swimming then still and sometimes folded.

Confused with: very little if you can see the paddles at the back and the terminal point

Distinctive wetland crustaceans

Order Anostraca (fairy shrimp and introduced sea monkeys)



Native fairy shrimp (left) tend to be larger (up to 25mm) and paler coloured, while the introduced sea monkeys (right) tend to be smaller (up to 10mm) and pink or orange. Native fairy shrimp can live in fresh or salty waters, while sea monkeys prefer salty waters.

Size: Up to 25mm. ■

Habitat: Wetlands, salt lakes.

Movement: Constant with pulsing rows of legs.

Confused with: Nothing, but can be difficult to definitively separate natives from pest species.

Order Notostraca (shield shrimp, tadpole shrimp)



Size: Up to 40mm.

Habitat: Wetlands.

Movement: Swimming.

Confused with: Nothing in wetlands ...but they do look like horseshoe crabs.

Order Conchostraca (clam shrimp)



Size: Up to 8mm (but usually around 5mm)

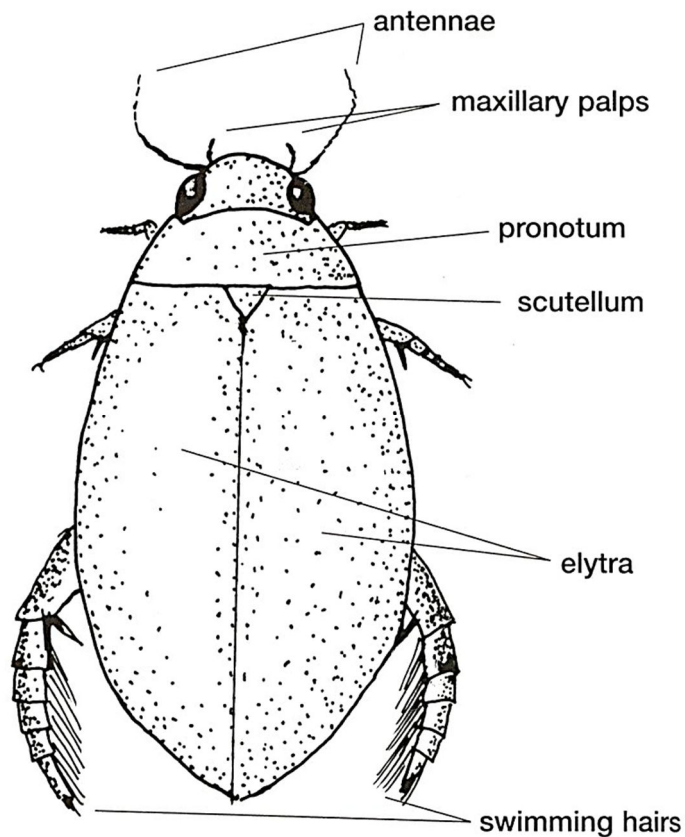


Habitat: Temporary Wetlands. Common but cryptic and short lived.

Movement: Busy, haphazard then they drop from the water column.

Confused with: Some pea shells, but legs are obvious on live animals.

4a. ALT key to Adult Beetles (Coleoptera)



BEFORE YOU START:

- Make sure you have a beetle (Coleoptera). The following checklist shows some differences between adult beetles (Coleoptera) and bugs (Hemiptera).

BEETLES (Order: Coleoptera)

- Always rounded on the back
- Small heads, narrower than the rest of the body
- Eyes small and often protrude slightly
- Beetles have a smoother swimming action than bugs
- Some beetles do not swim
- Never run on top water surface, but may swim on the surface or crawl UPSIDE DOWN under the surface

BUGS (Order: Hemiptera)

- Flat backs
- Heads usually as wide as body
- Large eyes are often flush with the head and widely separated
- Jerky swimming action
- All subsurface bugs can swim in some way
- Surface bugs run on top of the water

NB: Families end in 'ae' and genus and species names are in *italics*.

| | | |
|---|-------------------------------------|-----|
| 1 | Beetles active swimmers. | → 5 |
| | Beetles crawl (or don't move much). | → 2 |

| | | |
|-------|--|---------------------------------|
| 2 (1) | Beetles have a distinct 'nose' or snout. | weevils Family Curculionidae |
| | Beetles have no 'nose'. (How does it smell?) | → 3 |

Family Curculionidae (weevils)





Size: Up to 9mm. ■

Habitat: Vegetation in wetlands.

Movement: slow, ponderous.

Confused with: Nothing, it has a distinctive nose.

| | | |
|-------|--|--|
| 3 (2) | Small to tiny beetles with well-developed claws, usually black, sometimes dark brown or red, with a shiny plastron or bubble vest; slow moving, sometimes hang motionless mid-water. |  riffle beetles Family Elmidae |
| | Not as above, may crawl on the underside of the water surface. |  4 |

Family Elmidae (riffle beetles)



Size: Up to 6mm (usually under 3mm)

Habitat: Cool flowing waters (riffles), often found on wood, common but hard to see.

Movement: Hangs in the water or clings to detritus, slow.

Confused with: Nothing, very few beetles are as slow or with such impressive claws. Often overlooked due to size.



Lower photo shows the plastron or bubble vest.

| | | |
|-------|---|--|
| 4 (3) | Small to tiny, elongate, often metallic beetles. Rare. | crawling water beetle Families Hydraenidae and Hydrochidae |
| | Larger dull coloured beetles sometimes with prominent yellow egg sac. | water scavenger beetles Family Hydrophilidae Genus <i>Helochares</i> |

Families Hydraenidae and Hydrochidae (crawling water beetles)



Size: 1- 4 mm. ■

Habitat: Wetlands, wet rock surfaces near waterfalls. Uncommon, but can be abundant. Hydraenids in wetlands can walk on the water undersurface.

Movement: Slow walking.

Family Hydrophilidae, Genus *Helochares*



Size: Up to 8mm. ■

Habitat: Wetlands and river edges.

Movement: Slow, sometimes walk on the water undersurface.

Confused with: other hydrophilids, but *Helochares* does not swim.

| | | |
|-------|---|---------------------------------------|
| 5 (1) | Beetles swim rapidly in circular patterns on the water surface as well as below, shiny beetles with legs tucked neatly under body, often found in groups. | whirligig beetles Family Gyrinidae |
| | Beetles swim submerged, with obvious legs. | → 6 |

Family Gyrinidae (whirligig beetles)



Size: Up to 12mm.



Habitat: wetlands and river edges, common and conspicuous.

Movement: Fast, and mainly on the surface in circular patterns, although they will dive if threatened.

Confused with: Nothing, movement and appearance are both very distinctive.

| | | |
|-------|---|---|
| 6 (5) | Beetles appear to swim with all 3 or at least 2 pairs of legs. Legs move alternately. | → 7 |
| | Beetles appear to swim with only the rear pair of legs, legs move in unison; motion is like breast stroke. Rear swimming legs held upwards when beetles rest. | diving beetles Family Dytiscidae → Go further! 8. |

| | | |
|-------|--|---|
| 7 (6) | Always with a black head and a brown body; may screech when in net or tray. Distinctively 'lumpy' appearance; Rare. | screech beetles (Hygrobiidae) Genus <i>Hygrobia</i> |
| | Often black but may be green or brown. Flat on the underside, sometimes with a bubble vest; head bent downwards; Common. | water scavenger beetles (Hydrophilidae) |

Family Hygrobiidae, Genus *Hygrobia* (screech beetles)



Size: Up to 10mm.



Habitat: .Wetlands. Rare.

Movement: As for hydrophilids.

Confused with: Nothing, the oddly lumpy appearance is distinctive. Most will screech while being collected.



Family Hydrophilidae (water scavenger beetles)



Size: very variable 2-35mm.

Habitat: .Wetlands and river edges. Common and abundant.

Movement: Ambling swim.

Confused with: See dytiscids below.



| | | | |
|-------|------------|------------|------|
| 8 (6) | Small | < 4 mm | ➡ 9 |
| | Medium | 4 - 10 mm | ➡ 10 |
| | Large | 10 - 15 mm | ➡ 11 |
| | Very Large | > 15 mm | ➡ 12 |

| | | |
|-------|---|---|
| 9 (8) | Conspicuous lateral stripes, water-drop shaped beetles. | Family Dytiscidae Genus <i>Australphilus</i> |
| | Pronotum constricted to give the beetles a distinctly waisted look. | waisted diving beetles Family Dytiscidae Genus <i>Carabhydrus</i> |
| | Not as above. | little diving beetles Family Dytiscidae |

Family Dytiscidae, Genus *Australphilus*



Size: Up to 3mm. ■

Habitat: Running water. Rare.

Movement: Strong fast swimmer.

Confused with: Nothing, strong colour pattern and tapered body are distinctive.

Family Dytiscidae, Genus *Carabhydrus* (waisted diving beetles)



Size: Up to 3.5mm. ■

Habitat: Running water. Rare.

Movement: Less coordinated than other dytiscids.

Confused with: Nothing, strong constriction of the pronotum is distinctive.

Family Dytiscidae, various genera (little diving beetles)



Size: Up to 4mm. ■

Habitat: Wetlands and slow moving water in rivers.

Movement: Strong swimmer using hind legs, rarely stops moving.

Confused with: Nothing, most of the medium beetles should be noticeably larger.

| | | |
|--------|--|---|
| 10 (8) | Beetles with some form of colour pattern (variable patterns: mottled, brindled, stripes or patches.) | mixed diving beetles Family Dytiscidae |
| | Beetles totally lack colour. Black. | stealth diving beetles Family Dytiscidae |

Family Dytiscidae, various genera (mixed diving beetles)



Size: Up to 8mm. ■

Habitat: Wetlands and slow moving water in rivers.

Movement: Strong swimmer using hind legs.

Confused with: Anything with a pattern in this size class is considered the same.

Family Dytiscidae, various genera (stealth diving beetles)



Size: Up to 10mm. ■

Habitat: Wetlands and Rivers.

Movement: Some of these may move quite slowly for diving beetles.

Confused with: Nothing, black. May sometimes have a light coloured spot on the head.

| | | |
|--------|---|--|
| 11 (8) | Beetles with distinctive longitudinal stripes (like a pin-stripe). | Family Dytiscidae Genus <i>Lancetes</i> |
| | Without stripes, dark patch in middle of head, body pale underneath. | Family Dytiscidae Genus <i>Eretes</i> |
| | Without stripes, light patch in middle of head, body dark underneath. | Family Dytiscidae Genus <i>Rhantus</i> |

Family Dytiscidae, Genus *Lancetes*



Size: Up to 10mm.

Habitat: Wetlands and Rivers.

Movement: Strong swimmer using hind legs.

Confused with: Nothing, very distinctive stripes.



Family Dytiscidae, Genus *Eretes*



Size: Up to 16mm.

Habitat: Wetlands and slow moving water in rivers.

Movement: Strong swimmer using hind legs.

Confused with: *Rhantus*, but colour patterns are different, note *Eretes* has a pale coloured underside.



Family Dytiscidae, Genus *Rhantus*



Size: Up to 14 mm.

Habitat: Wetlands and slow moving water in rivers.

Movement: Strong swimmer using hind legs.

Confused with: *Eretes*, see above.



| | | |
|--------|--|--|
| 12 (8) | Beetles dark / black. | Family Dytiscidae Genus <i>Hyderodes</i> |
| | Beetles Green, with dark undersides. Never larger than 20mm. | Family Dytiscidae Genus <i>Spencerhydrus</i> |
| | Beetles Green, with orange undersides. Often larger than 20mm. | Family Dytiscidae Genus <i>Onychohydrus</i> |

Family Dytiscidae, Genus *Hyderodes*



Size: Up to 20 mm.

Habitat: Temporary wetlands.

Movement: Strong swimmer using hind legs.

Confused with: Large hydrophilid beetles, but hydrophilids are flat underneath.



Family Dytiscidae, Genus *Spencerhydrus*



Size: Up to 18mm.

Habitat: Temporary wetlands.

Movement: Strong swimmer using hind legs

Confused with: *Onychohydrus*, but *Onychohydrus* is usually larger and pale underneath. (Photo is actually *Onychohydrus* ...but they are very, very similar).



Family Dytiscidae, Genus *Onychohydrus*



Size: Up to 28mm.

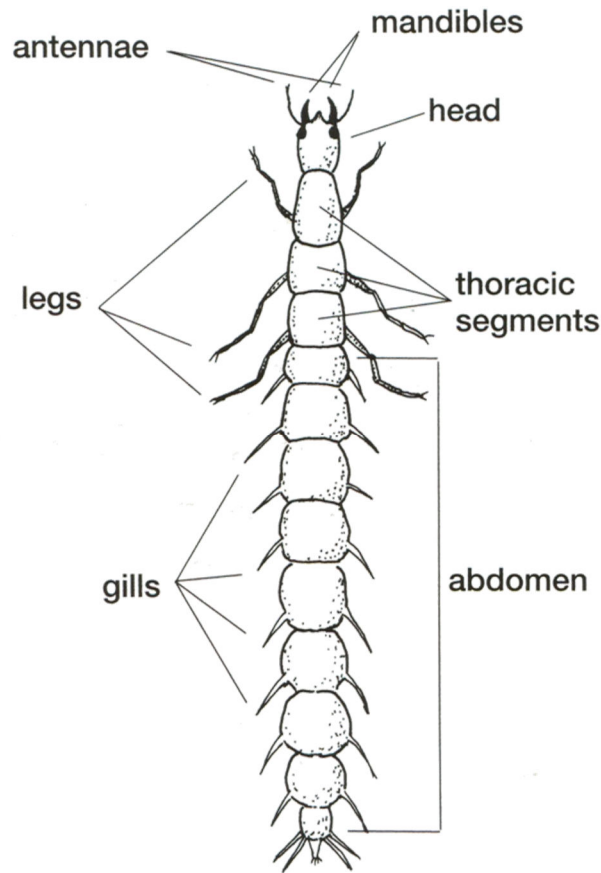
Habitat: Temporary wetlands.

Movement: Strong swimmer using hind legs.

Confused with: *Spencerhydrus*, but *Spencerhydrus* is smaller and dark/black underneath.



4b. ALT Key to Beetle Larvae (Coleoptera)



Check at the end of this key for a couple of peculiar, rare beetle larvae. You probably don't have them, but it would be ace if you did.

| | | |
|----------|--|--|
| 1 | Beetle larvae swim actively with all legs; usually with wide flat heads and prominent mandibles; middle of the head sometimes projected forwards like a nose on smaller examples; may be biting and killing other animals in the tray. | water tigers Family Dytiscidae → Go further! 8 |
| | Beetle larvae crawl slowly, or, may propel themselves by longitudinal thrashing of the body. | → 2 |

| | | |
|-------|--|--|
| 2 (1) | Strongly flattened, round, slater-like larvae, on rocks. | water pennies Family Psephenidae Genus <i>Sclerocyphon</i> |
| | Not as above. | → 3 |

Family Psephenidae, Genus *Sclerocyphon* (water pennies)



Size: Up to 10mm.

Habitat: Fast flowing water. .

Movement: Slow or not at all.

Confused with: Trilobites, but they have been extinct since the Carboniferous (280,000,000 years ago), and are marine.

| | | |
|-------|--|-----|
| 3 (2) | Elongate slow moving larvae with hard bodies and short legs; often dark coloured, flowing water. | → 4 |
| | Soft bodied larvae, still and flowing water. | → 6 |

| | | |
|------|--|------------------------------------|
| 4 or | Flattened, cockroach-like larvae with simple bodies and long antennae. Yellow, brown to black. | marsh beetles Family Scirtidae. |
| | Larvae with short antennae, not obviously flattened. | → 5 |

Family Scirtidae (marsh beetles)



Size: Up to 10mm (but there are monsters in some wetlands).

Habitat: Flowing water, wetlands, river edges. Fairly common.

Movement: Slow.

Confused with: Nothing, the flattened shape and long antennae are good characters.

| | | |
|-------|--|---|
| 5 (4) | Small to tiny and often comma shaped. | riffle beetles Family Elmidae |
| | Larger more elongate larvae shiny, water repellent skin. Sometimes stuck in water surface tension. | ptilodactylids Family Ptilodactylidae Genus <i>Byrrocryptus</i> |

Family Elmidae (riffle beetles)



Size: Up to 6mm. Usually smaller.

Habitat: Cool flowing water. Very common. Often found on wood.

Movement: Slow or still, very difficult to see, some species are very small and camouflaged.....good luck.

Confused with: Nothing, but often overlooked.

Family Ptilodactylidae, Genus, *Byrrocryptus* (ptilodactylids)





Size: Up to 20mm.

Habitat: cool flowing water, river edges.


Movement: Slow, often holding onto vegetation, or trapped in surface tension.

Confused with: Nothing.

| | | |
|-------|---|--|
| 6 (3) | Elongate, slender larvae with feathery lateral gills and terminal anal claws (see picture); head dark, body pale. |  whirligig beetles Family Gyrinidae |
| | Robust larvae, without feathery gills but may have long lateral filaments; large head with prominent mandibles. | water scavenger beetles Family Hydrophilidae  Go further! 7 |

Family Gyrinidae (whirligig beetles)



Size: Up to 15mm. 

Habitat: Wetlands and river edges.
Uncommon.

Movement: Fast, mix of swimming with legs and undulating the abdomen.

Confused with: Nothing, feathery projections are distinctive, may need a hand lens to see these.

| | | |
|---|--|---|
| Two genera can be readily recognised, but there are many more. Most other larvae are a lot like <i>Hydrophilus</i> but nowhere near as big. | | water scavenger beetle larvae Family Hydrophilidae |
| 7 (6) | Abdomen with long lateral filaments. | tasselled scavenger Family Hydrophilidae Genus <i>Berosus</i> |
| | Large beetle larvae, abdomen without long lateral filaments. | ugly Bob Family Hydrophilidae Genus <i>Hydrophilus</i> |

Family Hydrophilidae (water scavenger beetle larvae)



Size: Up to 10mm. 


Habitat: Wetlands and river edges.

Movement: Slow crawl.

Confused with: Juvenile ugly bobs (*Hydrophilus*) are difficult to tell apart, but they have darker heads that are angled/kinked up. For other hydrophilid larvae, the head is in line with the rest of the body.

Family Hydrophilidae Genus *Berosus* (tasselled scavengers)



Size: Up to 8mm. 


Habitat: Wetlands and river edges.

Movement: Slow crawl.

Confused with: Gyrinid larvae, but the lateral filaments on *Berosus* lack feathering, and *Berosus* is rarely as slender.

Family Hydrophilidae Genus *Hydrophilus* (Ugly Bob)



Size: Up to 50mm. 

Habitat: Wetlands.

Movement: Slow crawl.

Confused with: Nothing. Nothing else gets this big.



| | | |
|-------|------------------------------|---------------------------------|
| 8 (1) | Larvae with a strong 'nose'. | some Dytiscidae nosey tigers |
| | Larvae without a nose. | → 9 |

Family Dytiscidae, (nosey tigers)



Size: <12mm.

Habitat: Wetlands and river edges. Very common.

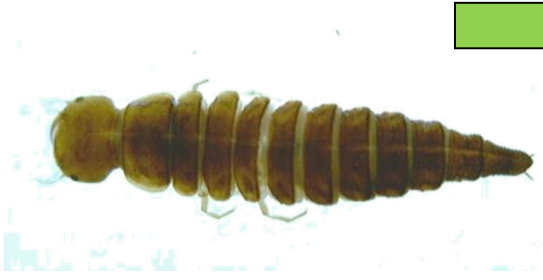
Movement: Constant, all legs moving.

Confused with: BEWARE: These animals have a pair of tails, or 2 tails and a siphon, so can potentially end up ID'd as stoneflies or mayflies.

| | | |
|-------|---|--|
| 9 (8) | Larvae strong swimmers, constantly moving, obvious tails. | → 10 |
| | Larvae crawl slowly, tails minute. | some Dytiscidae crawling water tigers |

| | | |
|--------|--|--|
| 10 (9) | Larvae without a pair of tails. Last segment tapers to a point and is fringed with swimming hairs. | some Dytiscidae taper-tailed tigers |
| | Larvae with two distinct tails. | some Dytiscidae two-tailed tigers |

Family Dytiscidae, (crawling water tigers)



Size: up to 12mm.

Habitat: Wetlands and temporary waters.

Movement: Slow.

Confused with: Nothing, all the other dytiscid larvae will be fast moving.

Family Dytiscidae, (taper-tailed tigers)



Size: 12 - 50mm.

Habitat: Wetlands / temporary water.

Movement: Constant, all legs moving.

Confused with: Some two-tailed tigers will have smallish tails, so you might need to check with a hand lens.



Family Dytiscidae, (two-tailed tigers)



Size: 12 - 35mm.

Habitat: Wetlands / temporary water.

Movement: Constant, all legs moving.

Confused with: see taper-tailed tigers above. Small individuals might key out as swimming water tigers, but swimming water tigers usually have better developed tails.

PECULIAR BEETLE LARVAE

Family Hygrobiidae, Genus *Hygrobia* (screech beetles)



Stout dark coloured mole-like larvae. Rear end with 3 prongs.

Size: Up to 10mm. 

Habitat: Wetlands. Rare.


Movement: Slow, some swimming.

Confused with: Nothing, shape is quite bizarre.

Family Haliplidae, Genus *Haliphus* (tortoise beetle larvae)



Elongate larvae with 3 rows of spines on the body and long tail. Yellow/pale with dark bands.

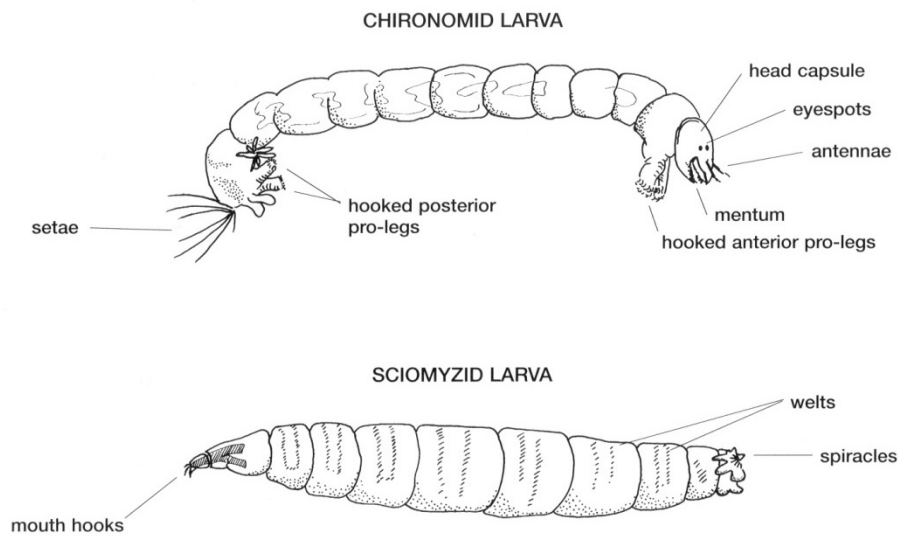
Size: Up to 5mm. 

Habitat: Wetlands, river edges. Rare.

Movement: Slow.

Confused with: Nothing, really distinctive tail and overall form.

5. ALT Key to True Fly Larvae



BEFORE YOU START:

- Maggots can be hard to identify. Their soft bodies mean they can modify their shape considerably. You might need to watch closely to see some of the features used in the key.
- To separate floaters and sinkers (couplet 1- the witch test) you might need to add more water to the cubes or move your specimen to a deeper container.

| | | |
|---|---|-----|
| 1 | Maggots break the surface of the water to breathe; their bodies are buoyant in deeper water (floaters). | ➔ 8 |
| | Maggots don't need contact with the water surface, bodies are not buoyant in deeper water, may still be active and swim past the surface (sinkers). | ➔ 2 |

| | | |
|-------|---|----------------------------------|
| 2 (1) | Bleffs (very distinctive, see picture below), only found in fast flowing water. | bleffs Family Blephariceridae |
| | Not a bleff. | ➔ 3 |

Family Blephariceridae (bleffs)



Size: Up to 13mm. ■

Habitat: Fast flowing streams with stable boulders, lives in the fastest bits.

Movement: Strange sideways shuffle.

Confused with: Nothing, very distinctive.

find these and you get to make a wish!

| | | |
|-------|---|-----|
| 3 (2) | Animal with a head capsule; long, thin, worm-like or leech-like body form and movement. | → 5 |
| | Animal without a head capsule; traditionally maggot-like in body form and movement. | → 4 |

| | | |
|-------|--|---|
| 4 (2) | Appendages along both sides of the animal (see picture). | tasselled maggots Family Athericidae |
| | Animal without appendages or only present on the final segments of the animal. | assorted riverine maggots Families: Tabanidae, Dolichopodidae, Empididae some Tipulidae |

Family Athericidae (tasselled maggots)



Size: Up to 10 mm.

Habitat: Rivers, gravel and sand.

Movement: Slow moving.

Confused with: Nothing, very distinctive once you have definitely seen the side projections.


Families Tabanidae, Dolichopodidae, Empididae some Tipulidae (assorted riverine maggots)



Size: variable.

Habitat: Rivers, usually amongst gravels. Common.

Movement: Slow moving.

| | | |
|-------|---|---------------------------------------|
| 5 (3) | Animal moves like a leech, rarely losing hold of the substrate, abdomen broadly swollen giving a 'chicken drumstick' appearance, expandable antennae modified to form broad 'antlers' for filter feeding; typical of fast flowing waters with solid surfaces.  | black fly larvae Family Simuliidae |
| | Animal moves by coiling and uncoiling, or by rapid undulations. Unattached to the substrate; abdomen may be swollen but only the very end; antennae small and simple if present. | → 6 |

Family Simuliidae (black fly larvae)



Size: Up to 5mm. 

Habitat: Fast flowing waters. Common and abundant.

Movement: leech-like.

Confused with: Nothing, very distinctive. Chicken drumstick leeches.

| | | |
|-------|------------------------------|--|
| 6 (5) | Animals obviously red. | blood worms Family Chironomidae several genera |
| | Colour variable but not red. | → 7 |

Family Chironomidae, several genera (blood worms)



Size: Up to 14mm. █

Habitat: Wetlands, still water. Common.

Movement: Coil and uncoil quickly in a figure of eight, sometimes thrashing or using prolegs to drag themselves along the ground.

Confused with: Nothing, very distinctive.

| | | |
|-------|--|--------------------------------------|
| 7 (4) | Animal looks like a swimming eyelash. | pogs Family Ceratopogonidae |
| | Head capsule obvious, small prolegs at both ends of the animal, rarely longer than 7mm. | chironomids Family Chironomidae |
| | Head capsule retractable, no pro-legs, sometimes with a set of hairy, feathered or fleshy appendages at the posterior end, may be covered in downy hairs, often longer than 5mm. | crane-fly larvae Family Tipulidae |

Family Ceratopogonidae (pogs)



Size: Up to 10mm. █

Habitat: Wetlands, still water, river edges. Common.

Movement: like a stiff snake, or a swimming eyelash, very distinctive.

Confused with: Nothing, very distinctive movement, and nothing else has the pointy head.

Family Chironomidae (chironomids)



Size: Up to 13mm. █

Habitat: All habitats. Common.

Movement: Coiling uncoiling, quickly in a figure of eight, sometimes thrashing or using prolegs to drag themselves along the ground.

Confused with: Nothing, very distinctive ...but quite variable.

Family Tipulidae (crane fly larvae)



Size: Up to 36mm, (more commonly around 15mm). █

Habitat: All habitats. Common but not abundant.

Movement: Slow moving burrowing with twists, or with expansion and contraction.

Confused with: Nothing, very distinctive. Some have distinctive, swollen, rear ends (photo left) and others complicated breathing appendages (photo right).

| | | |
|-------|--|------|
| 8 (1) | Animal has obviously sclerotised (armoured or hardened) body plates, either the whole body or bands on all segments. | → 9 |
| | Animal mostly soft bodied, although it may have sclerotised plates on its head and abdomen. | → 10 |

| | | |
|-------|---|---|
| 9 (8) | All of body sclerotised (darkened and toughened skin), animal can grow to 20mm. | soldier fly larvae, leather jackets Family Stratiomyidae |
| | Only bands of the upper surface of the body are sclerotised, smaller than 6mm. | moth fly larvae Family Psychodidae |

Family Stratiomyidae (soldier fly larvae)



Size: Up to 20mm.

Habitat: Wetlands, still water, salt lakes. Common.

Movement: Slow moving almost still but floating.

Confused with: Nothing, very distinctive amount of sclerotisation and usually suspended from surface by its rear end.

Family Psychodidae (moth fly larvae)



Size: Up to 4mm.

Habitat: Wetlands, still water. Often overlooked.

Movement: Slow moving.

Confused with: Nothing, very distinctive once you have found them. Might look stripy like some elm mid beetle larvae.

| | | |
|--------|--|------|
| 10 (8) | Animals with obviously sclerotised (dark) head capsule and final segments. | → 11 |
| | Not as above. | → 12 |

| | | |
|---------|--|---------------------------------|
| 11 (10) | Animal restricted to the water surface, bent 'U' posture at rest, final segments usually out of the water so they distort the surface. | U bent midges Family Dixidae |
| | Often dive when disturbed, leaving the surface quite readily, move in a rapid tumbling or wriggling motion. | wrigglers Family Culicidae |

Family Dixidae ('U' bent midges)



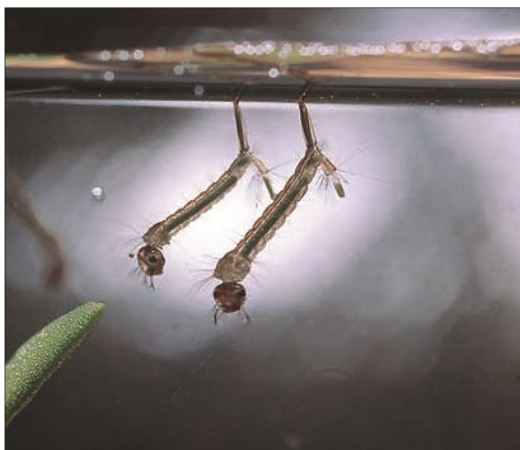
Size: Up to 6mm. ■

Habitat: Wetlands, still water, the edges of farm dams. Uncommon.

Movement: Bend and unbend just under water surface.

Confused with: Nothing, the large plate that punctures the surface (like an air anchor) and the movement are unique.

Family Culicidae (mosquito larvae, wrigglers)



Size: Up to 9mm. ■

Habitat: Wetlands, still water, even buckets left out for too long. Common.

Movement: thrashing and tumbling.

Confused with: Nothing, very distinctive and well known to most people.

| | | |
|---------|--|---|
| 12 (10) | Animal with a distinctive elongate tail (a snorkel). | rat-tailed maggot Family Syrphidae |
| | Animal with very few characteristics of note, maggot-like in appearance. | wetland maggots Families Sciomyzidae and Ephydriidae |

Family Syrphidae (rat tailed maggots)



Size: Up to 20mm (or 100mm if you count the stretchable snorkel).

Habitat: Still, nutrient rich (liquid faeces) waters.

Movement: Slow moving by stretching.

Confused with: Nothing, very distinctive.

Family Ephydriidae and Sciomyzidae (wetland maggots)



Size: Up to 15mm.

Habitat: Wetlands, still water, Ephydriids in salty lakes. Widespread.

Movement: Slow moving.

Confused with: Most things maggoty, the short body and welts are good clues. This group NEVER has tassels

Strange Maggots you might find:

Family Chironomidae, Genus *Symbiocladius* (backpack midge)

Size: Up to 6mm. 



headed leptophlebs like the one in this photo.


Habitat: Rivers
(possibly more in the edges).

Movement: With the host or not at all.

Confused with:
Nothing, very distinctive, usually found on square

Family Chaoboridae (phantom midges)



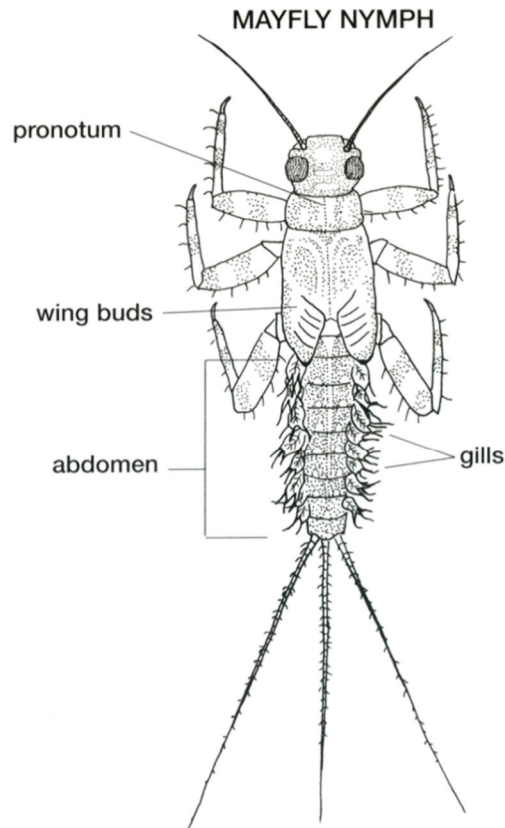
Size: Up to 10mm. 

Habitat: Lakes, shallow pools.

Movement: Still, and then flicks of the body.

Confused with: Nothing, very distinctive, but very difficult to see.

6. ALT Key to Mayflies (Ephemeroptera)



| | | |
|----------|---|-----|
| 1 | Nymphs with gills along the side of the abdomen. | ➡ 3 |
| | Nymphs with no visible gills along the sides of the abdomen; gill covers over part of the abdomen; gill covers can look like wing buds but are always behind the last pair of legs. | ➡ 2 |

| | | |
|--------------|--|--|
| 2 (1) | Very small <5mm grey brown nymphs with a fuzzy silt covered appearance. Slow moving but may swim lazily. Flat gill covers large, meeting along the midline like a mini skirt. | caenids (Caenidae) |
| | Larger nymphs with a camouflage pattern and eyes which may appear to shine in bright light. Rarely crawl but swim rapidly. Gill covers small, elliptical, not meeting in the middle. | oniscigastrids (Oniscigastridae) <i>Genus Tasmanophlebia</i> |

Family Caenidae (caenids)



Size: Up to 8mm. █

Habitat: still and slow moving waters with silty areas. Common.

Movement: Slow moving.

Confused with: Nothing, very distinctive once you have seen the square gill covers.

Family Oniscigastridae, Genus *Tasmanophlebia* (oniscigastrids)



Size: Up to 15mm. █

Habitat: cool flowing water, edges, backwaters, forest streams. Uncommon.

Movement: Slow moving.

Confused with: Nothing, very distinctive patterning.

| | | |
|----------------------|--|--|
| <p>3 (1)</p> | <p>Robust dark brown nymphs with alternating spiny V-shaped gills and smaller feathery gills. Move with a distinct rocking horse motion. Large thorax giving a hunched appearance.</p> | <p style="text-align: right;">stream horses</p> <p style="text-align: right;">Family Coloburiscidae</p> <p style="text-align: right;">Genus <i>Coloburiscoides</i></p> |
| <p>Not as above.</p> | | <p style="text-align: right;">→ 4</p> |

Family Coloburiscidae, Genus *Coloburiscoides* (stream horses)



Size: Up to 20mm. (Image is roughly X2).

Habitat: Cool upland streams. Common and abundant in healthy boulder streams.

Movement: like a rocking-horse.

Confused with: Nothing, very distinctive in robustness and movement. Look for spiky V shaped gills for confirmation.

| | | |
|-------|---|---|
| 4 (3) | Large nymphs with helmet-like heads and prominent eyes; two different types of gill which are flicked in sync; crawl slowly but can swim rapidly. | killer mayflies Family Ameletopsidae Genus: <i>Mirawara</i> |
| | Not as above head not helmet like, upper and lower gills similar. | → 5 |

Family Ameletopsidae, Genus *Mirawara* (killer mayflies/ purple perils)



Size: Up to 20mm.

Habitat: Fast flowing cool cobbly streams. Rare.

Movement: Fast and searching for prey. Regularly 'shuffles' gills.

Confused with: Nothing, very distinctive head shape and size.

| | | |
|-------|---|--|
| 5 (4) | Nymphs usually run rather than swim, but can 'dolphin' clumsily if disturbed. Conspicuously flattened nymphs, head square. Legs sprawling with wide, flat femurs. | leptophlebs Family Leptophlebiidae → Go further! 7 |
| | Nymphs are fast swimmers, but swim in bursts like tiny fish. Nymphs not flattened or sprawling, head bullet shaped. Tails fringed with hairs. | → 6 |

| | | |
|-------|---|--|
| 6 (5) | Large nymphs up to 17mm. Antennae shorter than head. Rare. | siphonurids Family Siphonuridae Genus <i>Ameletoides</i> |
| | Small nymphs less than 10mm. Antennae longer than head. Common. | baetids Family Baetidae |

Family Siphonuridae (siphonurids)



Size: Up to 17mm.

Habitat: Cool, fish free alpine streams and lakes. Very rare.

Movement: Walks slowly, infrequent bursts of movement.

Confused with: Baetids, but baetids are generally smaller, and have long antennae.

Family Baetidae (baetids)




Size: Up to 10mm (usually around 5mm).

Habitat: Still and flowing waters. Common.

Movement: Bursts of movement like a tiny fish.

Confused with: See siphonurids.

| | | |
|-------|---|---|
| 7 (5) | Gills fluffy, each one ending in many fingers making them look like tinsel.  | Family Leptophlebiidae Genus <i>Atalophlebia</i> |
| | With a conspicuous set of horns. | Family Leptophlebiidae Genus <i>Jappa</i> |
| | Not as above. | leptophlebs Family Leptophlebiidae various genera |

Family Leptophlebiidae, Genus *Atalophlebia*



Size: Up to 22mm.

Habitat: Slower flowing waters, sometimes wetlands. Very common.

Movement: Can sometimes 'dolphin' when disturbed, but otherwise walks.

Confused with: Other leptophlebs, but the banded legs and fluffy gills are VERY distinctive.

Family Leptophlebiidae, Genus *Jappa*



Size: Up to 20mm.

Habitat: Slower flowing rivers. Rare.

Movement: Slow.

Confused with: Nothing else has horns.

Family Leptophlebiidae (leptophlebs) various genera

Size: Up to 20mm.

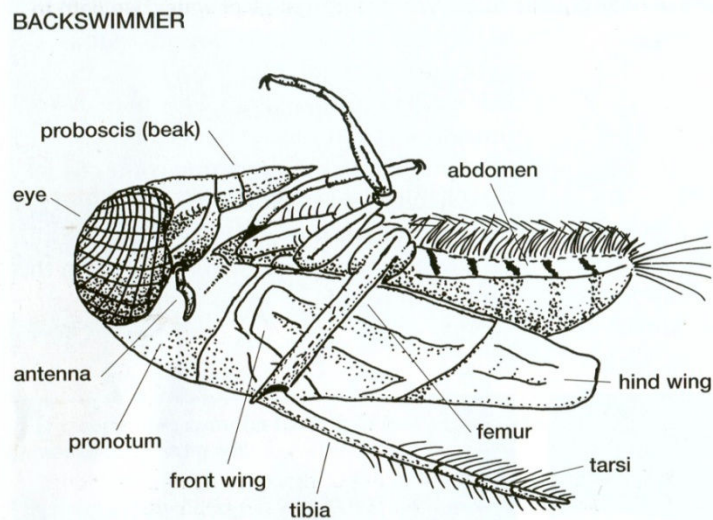
Habitat: cool running water. Very common.

Movement: Scurry, then stay still. A bit like a huntsman spider, can sometimes 'dolphin' when disturbed.



7. ALT Key to True Bugs (Hemiptera)

BEFORE YOU START:



- True bugs don't have wings when they are young (see page 72 for details).
- Make sure you have a bug (Hemiptera). The following checklist shows some differences between beetles (Coleoptera) and bugs (Hemiptera).

BUGS (Order: Hemiptera)

- Wing covers overlap asymmetrically
- Flat backs
- Head usually as wide as the body
- Large Eyes are often flush with the head and are widely separated
- Jerky swimming action
- All subsurface bugs can swim in some way
- Surface bugs run on top of the water

BEETLES (Order: Coleoptera)

- Wing covers meet at midline
- Always rounded on the back
- Small heads, narrower than the rest of the body
- Eyes small and often protrude slightly
- Beetles have a smoother swimming action than bugs
- Some beetles do not swim
- Never running on top water surface, but may swim on the surface or crawl UPSIDE DOWN under the surface

NB: Families end in 'ae' and genus and species names are in *italics*.

| | | |
|---|--|-----|
| 1 | Bugs walking/running on the water surface. | → 2 |
| | Bugs swimming below the surface. | → 4 |

| | | |
|-------|--|---|
| 2 (1) | Short bodied bugs that move quickly on the water surface. | → 3 |
| | Elongate bugs with antennae at the very tip of the head. Walk slowly on water surface. | water measurers Family Hydrometridae |

Family Hydrometridae (water measurers)



Size: < 15mm.

Habitat: Wetlands, still water. Uncommon, but very cool.

Movement: Slow moving.

Confused with: Nothing, very distinctive.

| | | |
|-------|--|---|
| 3 (2) | Bugs with very long hind and middle legs. Move with a skating/sculling motion. | water striders Family Gerridae |
| | Small to tiny bugs with shorter legs, running on the water surface. | water treaders / runners Families: Veliidae/ Mesoveliidae/ Hebridae |

Family Gerridae (water striders)



Size: Body to 20mm leg span to 70mm (photo roughly accurate).

Habitat: Wetlands and river edges. Common.

Movement: Fast, jerky.

Confused with: nothing, very distinctive.

Families Veliidae/ Mesoveliidae/ Hebridae (water treaders)



Size: 3-5mm.



Habitat: Wetlands and river edges. Very common.

Movement: Fast, look a bit like they have been sped up.

Confused with: Nothing. If they are in large numbers and are dark or black they are probably Veliidae (two lower photos). Pale individuals are likely to be Mesoveliidae (top photo). Hebridae are relatively rare.



| | | |
|-------|------------------------------|-----|
| 4 (1) | Bugs walk or swim awkwardly. | ➔ 5 |
| | Bugs swim well. | ➔ 7 |

| | | |
|-------|--|--|
| 5 (4) | Ugly dark brown bugs with wide heads and a warty appearance. Pointed, grasping front legs. Semi-aquatic. | toad bugs Family Gelastocoridae |
| | Large (>20mm), elongate bugs with front legs for grabbing prey. Body stick or leaf like. Long legs. Long breathing tube at hind end. | water scorpions Family Nepidae ➔ Go further! 6 |

Family Gelastocoridae (toad bugs)



Size: 10mm.



Habitat: Wetlands and river edges. Rare.

Movement: Slow, ponderous, but surprisingly can jump.

Confused with: Nothing, very distinctive.

| | | |
|-------|--|--|
| 6 (5) | Long, thin, skinny bug, pale coloured. Looks like a stick or a piece of sedge. | slender water scorpions Family Nepidae Genus <i>Ranatra</i> |
| | Long flattened bug, dark or black. Looks like a leaf. | leafy water scorpions Family Nepidae Genus <i>Laccotrephes</i> |

Family Nepidae, Genus *Ranatra* (slender water scorpions)



Size: Up to 90mm including breathing tube.

Habitat: Wetlands. Still water, Uncommon but spectacular.

Movement: Swims awkwardly or not at all (sit-and-wait predator).

Confused with: Nothing, very distinctive.

Family Nepidae, Genus *Laccotrephes* (leafy water scorpions)



Size: Up to 90mm including breathing tube.

Habitat: Wetlands. Still water. Uncommon but spectacular.

Movement: Slow or not at all (sit-and-wait predator).

Confused with: Nothing, very distinctive.

| | | |
|-------|---|------|
| 7 (4) | Bugs swim upside down, with legs uppermost, dark on upper surface, lighter coloured underneath. | → 8 |
| | Bugs swim the right way up, with legs beneath them, wings on the upper surface if present. | → 10 |

| | | |
|-------|--|--|
| 8 (7) | Tiny orange bugs with a highly convex humped back. No prominent swimming legs. Look a bit like a tiny, mobile jelly bean. | pygmy backswimmers Family Pleidae |
| | Elongate bugs with two prominent, narrow swimming legs. Swim with a jerky motion. Very active. Obviously dark on one side (top) and light on the other (underneath). | backswimmers Family Notonectidae → Go further! 9 |

Family Pleidae (pygmy backswimmers)



Size: 3mm. ■

Habitat: Wetlands and river edges. Common but cryptic.

Movement: Swift then stopped.

Confused with: Immature Notonectidae.

| | | |
|-------|---|--|
| 9 (8) | Robust, chunky, fast moving. Either at water surface or holding onto something. Triangular when viewed from above. (left of image below) | robust backswimmers Family Notonectidae Genus <i>Enithares</i> |
| | Slender, relaxed, unhurried movement. Able to stay still mid-water (thanks to buoyancy regulation). Thinner and parallel sided when viewed from above. (right of image below) | slender backswimmers Family Notonectidae Genus <i>Anisops</i> |



Enithares sp. (lower left) and *Anisops* sp. (upper right) for comparison in an ice cube tray. Note the size difference (picture is roughly life size).

Family Notonectidae, Genus *Enithares* (robust backswimmers)



Size: Up to 12mm. ■

Habitat: Wetlands and slow river sections. Still water, Very common.

Movement: In bursts. Still at the surface while re-filling air supplies.

Confused with: slender backswimmers *Anisops*.

Family Notonectidae, Genus *Anisops* (slender backswimmers)



Size: Up to 9mm. ■

Habitat: Wetlands and slow river sections. Still water, Very common.

Movement: deliberate strokes of swimming legs, sometimes still, mid-water. Less relaxed in an ice cube tray.

Confused with: younger robust backswimmers *Enithares*.

| | | |
|---------------|---|---|
| 10 (7) | Larger 10-30mm bugs. Front legs pointed for piercing prey. Do not flick swimming legs when at rest. | → 11 |
| | Small (<10mm) active bugs with two broad paddle like swimming legs which they flick back and forth when at rest. Streamlined body, blunt head. An air bubble may be visible under the body. May make buzzing or squeaking sounds in the tray. | water boatmen Family Corixidae → Go further! 12 |

| | | |
|---------|--|---|
| 11 (10) | Medium sized bugs (10-15mm) with broad heads and light/dark checks (taxi stripes) along their sides. | creeping water bugs Family Naucoridae <i>Genus Naucoris</i> |
| | Larger bugs (up to 30mm) without checks. Flattened body, narrower heads. | giant water bugs Family Belostomatidae <i>Genus Diplonychus</i> |

Family Naucoridae, Genus *Naucoris* (creeping water bugs)



Size: Up to 12mm.



Habitat: Wetlands and weedy river edges. Common.

Movement: Slow, may crawl or swim.

Confused with: giant water bugs (Belostomatidae).

Family Belostomatidae, Genus *Diplonychus* (giant water bugs).



Size: to 30mm.



Habitat: Wetlands. Uncommon.




Movement: Slow, may crawl or swim.

Confused with: creeping water bugs (Naucoridae).



This part of the key works best with mature boatmen. If your specimen hasn't fully grown its wings, it will be harder to identify if it is a brindle boatman (*Micronecta*) or any other type (*Diaprepocoris* or *Agraptocorixa*).

Immature boatmen look like this (left).

| | | |
|----------------|---|---|
| 12 (10) | Segment after the head (pronotum) with distinctive stripes or bands (see photo) you need a hand lens to see this.  | striped boatmen Family Corixidae Genus <i>Sigara</i> |
| | Small boatmen (<4mm), mottled or brindle wing covers (see photo). By far the commonest corixid.  | little brindle boatmen Family Corixidae Genus <i>Micronecta</i> |
| | Head with 'nostrils' (Ocelli, they are more like eyes - see photo). Usually distinctly orange or yellow coloured head and underneath.  | Barry four-eyes Family Corixidae Species <i>Diaprepocoris barycephala</i> |
| | Large boatmen (>4mm) brown /yellow /grey, markings are not distinctive, looks a lot like television static (pre-digital telly). Unlike all of the above. Rare. | static boatmen Family Corixidae Genus <i>Agraptocorixa</i> |

Family Corixidae, Genus *Sigara* (striped boatmen)



Size: Up to 8mm. ■

Habitat: Wetlands and slow river sections. Slow moving water. Common.

Movement: In bursts.

Confused with: Nothing, very distinctive.

Family Corixidae, Genus *Micronecta* (little brindle boatmen)



Size: Up to 4.5mm. ■

Habitat: Wetlands and slow river sections. Very very common. Often found in large numbers (see soup picture left).

Movement: In bursts.

Confused with: Nothing, very distinctive.

**Family Corixidae, Species *Diaprepocoris barycephala*
(Barry four-eyes)**



Size: Up to 8mm. 

Habitat: Wetlands and slow river sections. Slow moving water.

Movement: In bursts.

Confused with: Nothing, very distinctive.

Family Corixidae genus *Agraptocorixa* (static boatmen)



Size: Up to 10mm. 

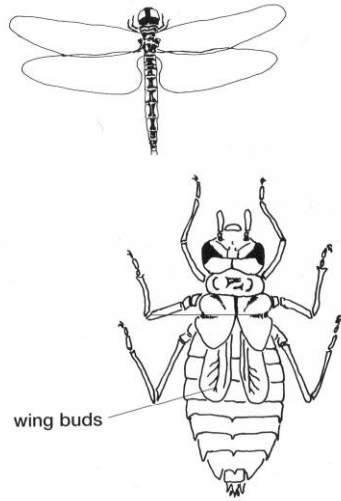
Habitat: Wetlands and slow river sections. Slow moving water. Common.

Movement: In bursts.

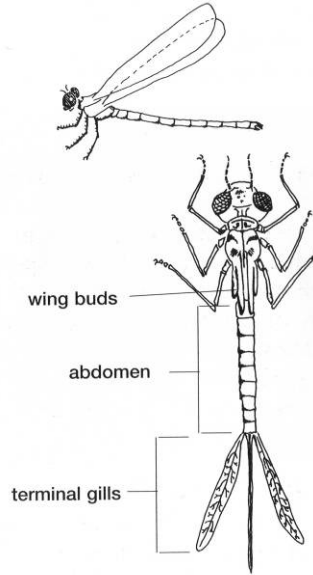
Confused with: all other boatmen if small.

8. ALT Key to Dragonfly and Damselfly larvae (Odonata)

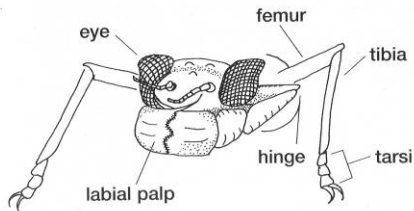
EPIPROCTOPHORA (DRAGONFLIES)



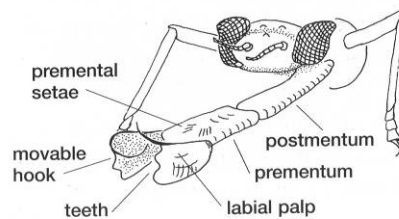
ZYGOPTERA (DAMSELFLIES)



ODONATE MOUTHPARTS (UNEXTENDED)



ODONATE MOUTHPARTS (STRIKING)



| | | |
|----------|---|---|
| 1 | Slender larvae, with 3 terminal gills (see diagram above). Swim by undulating (snake-like). | Damselflies suborder: Zygoptera ➔ 2 |
| | Robust larvae, without terminal gills (see diagram above). Swim by jetting water out of their bums. | Dragonflies suborder Epiproctophora ➔ 6 |

| | | |
|--------------|---|-----------------------------|
| 2 (1) | Leaf-like terminal gills held flat and fanned out horizontally. | Family Megapodagrionidae |
| | Gills different in shape or orientation. | ➔ 3 |

Family Megapodagrionidae (fan-tailed damselfly larvae)



Size: Up to 26mm.

Habitat: Occurs in slow flowing waters, at the edges of streams, in bogs and seepages. Uncommon.

Movement: Slow and deliberate.

Confused with: Nothing, unless it has lost its gills.

| | | |
|--------------|---|---|
| 3 (2) | Gills shorter than last 3 abdominal segments. | Family Synlestidae |
| | Gills equal in length or longer than last 3 abdominal segments. | ➔ 4 |

Family Synlestidae (short-tailed damselfly larvae)



Size: Up to 20 mm.

Habitat: At the edge of streams amongst tree roots and vegetation. Rare.

Movement: Slow and cautious.

Confused with: Nothing, unless it has lost its gills.

| | | |
|-------|---|---------------------|
| 4 (3) | Gills divided into two parts by constriction. | Family Isostictidae |
| | Gills complete, without constriction. | → 5 |

Family Isostictidae (split-tailed damselfly larvae)

Size: Up to 20 mm.

Habitat: At the edge of streams amongst tree roots and vegetation. Rare.

Movement: Slow and cautious.

Confused with: Will look almost exactly like a synlestid (stripy legs and all), but with longer, obviously divided gills.



| | | |
|-------|-----------------------------------|---|
| 5 (4) | Gills sack-like, with hairy ends. | Family Diphlebiidae |
| | Gills leaf like. | Family Lestidae and Family Coenagrionidae |

Family Diphlebiidae (sack-tailed damselfly larvae)

Size: Up to 30mm.

Habitat: Wetlands, or slow moving water in rivers.

Movement: Slow, but may swim with a sideways undulating motion if disturbed.

Confused with: Nothing, unless it has lost its gills.



Family Lestidae and Family Coenagrionidae (leaf-tailed damselfly nymph)



Size: Up to 30mm.







Habitat: Wetlands, or slow moving water in rivers. Very common and sometimes abundant.

Movement: Slow, but may swim with a rapid sideways undulating motion if disturbed.

Confused with: Nothing, unless it has lost its gills.



| | | | |
|--------------|---|--|--|
| <p>6 (1)</p> | <p>Fat, round ended body and long legs make them look spider-like.</p> <p>Mouthparts form a ladle-shaped mask in front of face.</p>  |  | <p>spider mud eye various families</p> |
| | <p>Relatively elongate bodies, NOT spider-like.</p> <p>Mouthparts flat, folded under 'chin'.</p>  |  | <p>→ 7</p> |

various families (spider mud eye)



Size: Up to 30 mm.

Habitat: Slow flowing waters, among detritus and silt.

Movement: Slow and careful, but can use a bum jet if disturbed.

Confused with:

| | | |
|-------|---|------------------------------|
| 7 (6) | Medium sized larvae with club or sausage shaped antennae. Sluggish, often green or brown. No obvious spines on the edges of abdominal segments. | gomphids Family Gomphidae |
| | Large larvae with tiny antennae and with spines on the edges of the abdominal segments. | → 8 |

Family Gomphidae (gomphids)


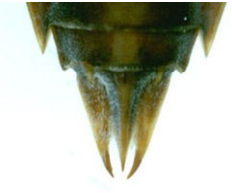

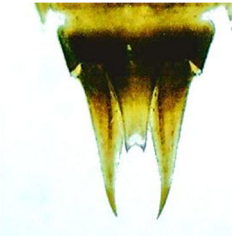


Size: Up to 30 mm.

Habitat: Rivers, among detritus and silt, and sometimes wetlands or lakes.

Movement: Slow and careful, but can use a bum jet if disturbed (see DVD).

Confused with: Nothing so long as you get a good look at the antennae. These are obvious even on juveniles.

| | | | |
|--------------|---|--|--|
| | <p>Dark mottled larvae usually with large spines on the edges of the abdominal segments. Central bum spine pointed. Rivers.</p>  |  | <p>teleflebs Family Telephlebiidae</p> |
| <p>8 (7)</p> | <p>Green or brown larvae. Central bum spine with a cut-off end. This can be seen even on small larvae.</p>  <p>Wetlands and lakes.</p> |  | <p>couta mud eye Family Aeshnidae</p> |

Family Telephlebiidae (teleflebs)



Size: Up to 30 mm. (picture is 2X)

Habitat: Rivers. Common.

Movement: Slow and careful, but can use a bum jet if disturbed.



Confused with: Note the 'Humbug' patterned juvenile is similar to Aeshnidae

Family Aeshnidae (couta mud eye)



Size: Up to 40 mm. (picture is 2X).

Habitat: Wetlands, slow rivers or lakes. Common.

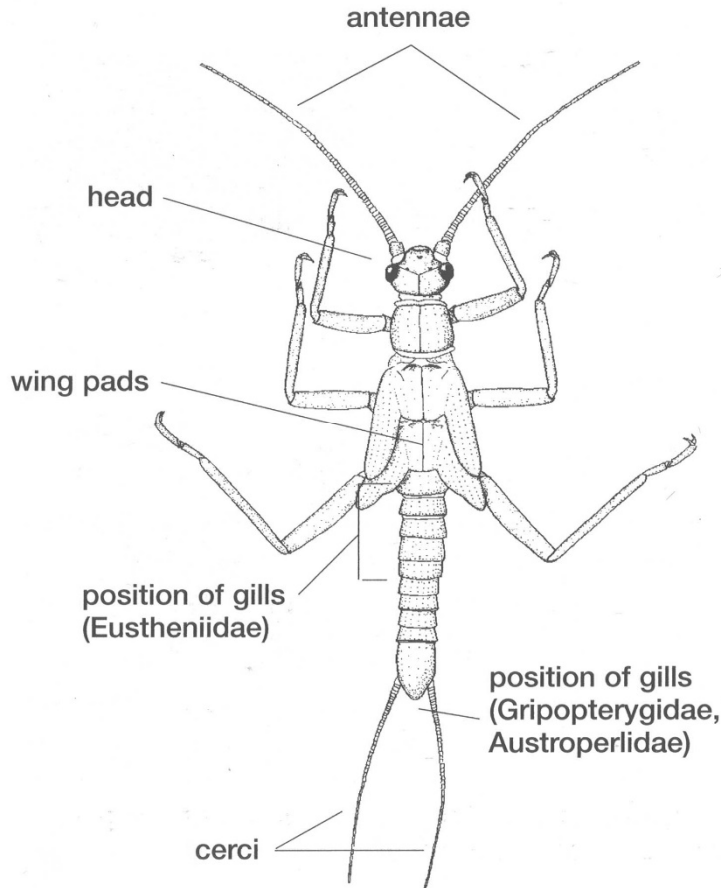
Movement: Slow and careful, but can use a bum jet if disturbed.





Confused with: see Telephlebiidae.

9. ALT Key to Stoneflies (Plecoptera)

GENERALISED STONEFLY NYMPH



| | | | |
|----------|---|--|----------------------------|
| 1 | <p>Large nymphs up to 40mm usually bright green, orange or blue.</p> <p>Animals with gills along the side of the abdomen.</p>  |  | <p>Family Eustheniidae</p> |
| | <p>Smaller nymphs, less flamboyantly coloured, with gills on the tip of the abdomen or with no visible gills.</p> | <p>➔ 2</p> | |

Family Eustheniidae (U sthenids)



Size: Up to 40 mm.

Habitat: upland streams, more often in alpine and sub-alpine areas.

Movement: Deliberate, may try and crawl out of picking tray.

Confused with: Nothing, robust, and distinctively coloured.

| | | |
|-------|--|--|
| 2 (1) | Nymphs with two long tails. (These could be broken leaving only 'stumps'). Gills either absent or look like a tuft or pom-pom at the end of the abdomen. | → 4 |
| | Nymphs with short tails, shorter than half the length of the abdomen. Only 3 or 5 gills, which are similar in length and thickness to the tails. | Family Austroperlidae → Go further! 3 |

| | | |
|-------|---|--|
| 3 (2) | Nymphs with a double row of spines along their backs. | Family Austroperlidae <i>Acruroperla atra</i> |
| | Nymphs without a double row of spines. | Family Austroperlidae all other species |

Family Austroperlidae, Species *Acruperla atra*



Size: Up to 18mm.

Habitat: Often associated with submerged wood in upland streams.

Movement: Slow, but deliberate.

Confused with: Nothing, one of the snazziest stonefly nymphs you will see.

Family Austroperlidae, all other species



Size: Up to 30 mm.

Habitat: Cool upland forested streams, often amongst bark and leaf litter.

Movement: Slow moving.

Confused with: Nothing, the short tails and long abdomen are good characters.

| | | |
|-------|---|---|
| 4 (2) | External gills form tuft at the tip of the abdomen earning them the common name of 'fluffy bums'. Often wag their abdomen to oxygenate the gills. | Family Gripopterygidae → Go further! 5 |
| | Smaller nymphs with no gills on the tip of the abdomen. May also wag, but don't have fluffy gills. | Family Notonemouridae |

Family Notonemouridae (noto nemoor ids)



Notice the 'alert' posture. photo shows the abdomen without gills.




Size: Up to 12mm.

Habitat: Occurs in small upland streams and in small lowland streams. Sometimes found in wetlands.

Movement: Fast, 'alert' and strangely dog-like.

Confused with: Gripops that

have retracted their gill tufts will key out here. Look closely with a hand lens, also check for tail wagging, a characteristically gripop behaviour.

| | | |
|-------|--|---|
| 5 (4) | Large, sprawling nymphs with hairy legs, hairs dark and conspicuous.  Often with high contrast patterns (see picture). | hairy sprawlers Family Gripopterygidae various genera |
| | Large, sprawling nymphs, hairs pale if present.  Blond (see picture). Never darkly patterned. | blond sprawlers Family Gripopterygidae Genus <i>Illiesoperla</i> |
| | Smaller nymphs, brown or black with a single row or ridge of triangular projections along their back (see picture).  | spiky reek o perla Family Gripopterygidae Species <i>Riekoperla montana</i> or <i>Riekoperla tuberculata</i> |
| | Without any of the above sets of characters. | gripops or fluffy bums Family Gripopterygidae all other species |

Family Gripopterygidae, various genera (hairy sprawler)



Size: Up to 18mm.



Habitat: Fast flowing rivers and streams.

Movement: Slow, sometimes flex side to side while unattached.



Confused with: Other gripops can be similar. With a white background you can be more confident that you haven't missed the dark, extremely hairy legs.

Family Gripopterygidae, Genus *Illiesoperla* (blond sprawlers)



Size: Up to 18mm.



Habitat: Rivers and streams.

Movement: Slow, sometimes flex side to side while unattached.

Confused with: Hairy sprawlers can appear similar. However, with a white background and a hand lens, you can be more confident that you haven't just



missed the hairy legs. *Illiesoperla* can have hairs on its legs, but never long dark ones, and often has light purple gills. Sometimes beige or brown rather than blond.

Family Gripopterygidae, Genus *Riekoperla* (spiky reek o perla)



Size: Up to 10mm. ■

Habitat: Upland streams.

Movement:

Confused with: Other gripops, you will need to look at these animals from the side to make sure you see the projections.

Family Gripopterygidae, various genera (gripops or fluffy bums)



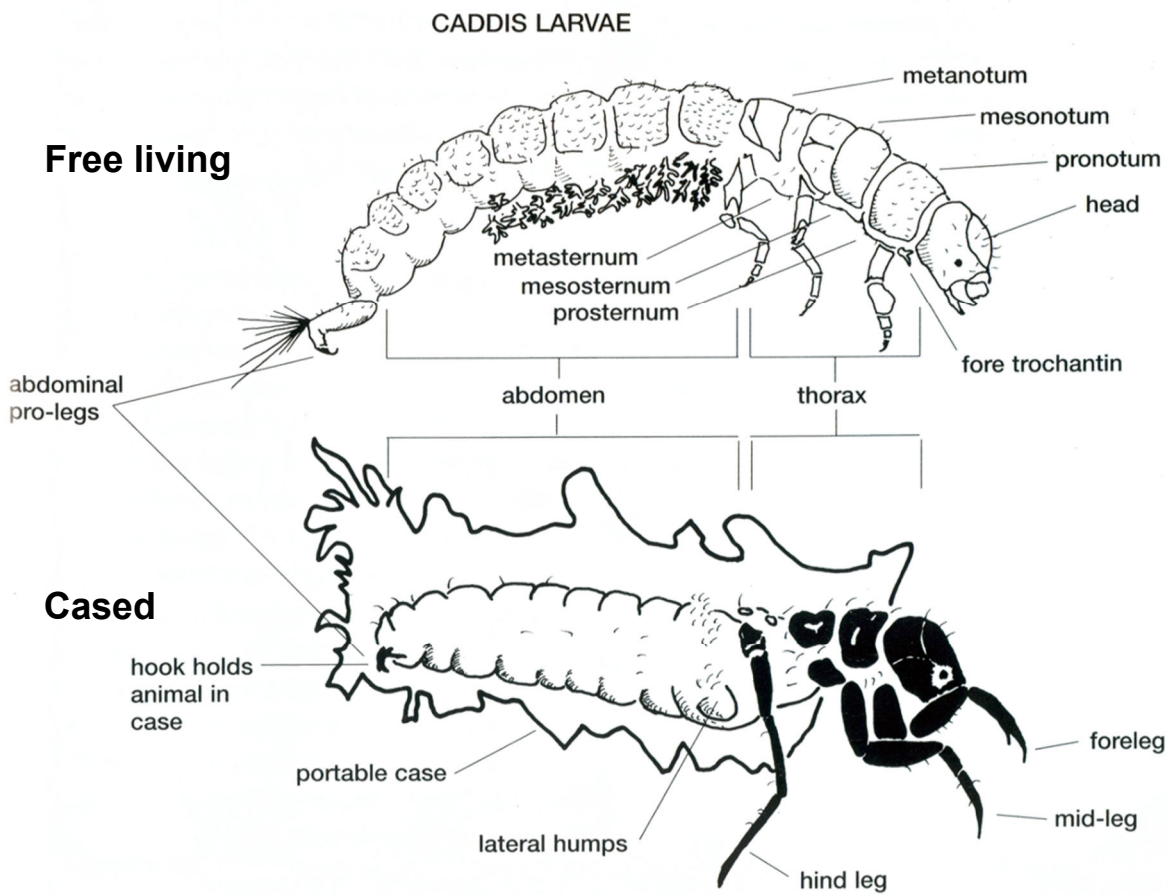
Size: Up to 10mm. ■

Habitat: Rivers and wetlands.

Movement:

Confused with: This is a diverse group of leftovers, check carefully for projections and hairy legs before using this name.

10. ALT Key to Caddis Fly Larvae (Trichoptera)



Before you start:

Many of the characters in this key rely on features of the portable case. In most instances, this is not a problem with live animals as they retain their cases. One possible exception to this is the igloo caddis (*Glossosomatidae*). Their little pink bodies with stumpy prolegs are a good clue that they should be in a case.


Also have you actually got a caterpillar (Order Lepidoptera)?

Check the dodgy build quality of the case construction (example below).



NB: Families end in 'ae' and genus and species names are in *italics*.


| | | |
|---|--|-----|
| 1 | Caddis living in a portable case. Most crawl slowly, some swim by head-thrashing or arm-waving; if out of case, body blunt ending with tiny prolegs and hooks. | → 5 |
| | Free-living caddis, body, long abdominal pro-legs with prominent claws. | → 2 |

| | | |
|------|--|-----|
| 2(1) | All three thoracic segments hard or sclerotised, they appear darker or different in colour to the soft abdomen.  | → 3 |
| | Only the first thoracic segment sclerotised. | → 4 |

| | | |
|------|---|---|
| 3(2) | Abdominal gills present (hairy chest), slow moving. May undulate abdomen to ventilate gills. To 15mm. | net spinning caddis Family Hydropsychidae |
| | Abdominal gills absent, often with a pattern on the head like a bandits mask. | bandit caddis Family Ecnomidae Genus <i>Ecnomus</i> |

Family Hydropsychidae (net spinning caddis)



Size: Up to 12mm. 

Habitat: Cool flowing water, riffles. Common.

Movement: Slow moving, sometimes thrashes in open water. Will undulate the abdomen to aerate their gills.

Confused with: Nothing, very distinctive once you have noticed the 'hairy chest' of gills on the abdomen.

Family Ecnomidae, Genus *Ecnomus* (bandit caddis)



Size: Up to 15mm.

Habitat: Still and flowing water, edges. Common.

Movement: Fidgets but slow moving.

Confused with: Some hunter caddis have a similar head pattern. They are relatively fast moving and 'quest' with their front legs for prey, while ecnomids are less active, and have all three leg-bearing segments sclerotised (hardened).

| | | |
|-------------|--|---|
| | <p>Larvae often green when alive. Forelegs modified into a pincer, or broad with a large spine. Larvae hunt from side to side with the forelegs.</p> | <p style="text-align: right;">hunter caddis Family Hydrobiosidae</p> |
| <p>4(2)</p> | <p>Larvae without pincers, body not green. Often pale, head brown or yellow. Don't tend to hunt actively.</p> | <p style="text-align: right;">ginger nut caddis</p> <p style="text-align: right;">Families: Philopotamidae/ Polycentropodidae/ <i>Ecnomus</i> of the Ecnomidae)</p> |

Family Hydrobiosidae (hunter caddis)



Size: Up to 20mm.


Habitat: Cool flowing water, riffles, and forest streams. Common.

Movement: Fast moving, hunt with front legs in front of their body on the off-chance they might hit prey.

Confused with: see Ecnomidae.

Families Philopotamidae / Polycentropodidae and Ecnomidae, Genus *Ecnomina* (ginger nuts)




Size: Up to 18mm. 

Habitat: Cool flowing water, riffles, edges, forest streams. Rare.

Movement: Slow moving.

Confused with: Nothing, very distinctive.

| | | |
|-------|---|---|
| 5 (1) | Tiny larvae <5mm long. Abdomen yellow, swollen, thicker than thorax. Purse shaped case of translucent silk, sometimes with sand or algae. Slow moving, hard to see. |  <p style="text-align: right;">micro caddis Family Hydroptilidae</p> |
| | Not as above. | → 6 |

Family Hydroptilidae (micro caddis)



Size: < 8mm. ■

Habitat: All water bodies, cases vary accordingly.

Movement: Slow moving, don't move at all immediately after being disturbed...will need 10-15 minutes to get over shock.

Confused with: Nothing, very distinctive ...but small.

| | | |
|------|--|---|
| 6(5) | Fang-shaped case made from fine particles, sometimes with a groove. Hind legs curved like talons, head pointy, all body segments covered in hairs. | <p>vulture caddis Family Atriplectididae Genus <i>Atriplectides</i></p> |
| | Not as above. | → 7 |

Family Atriplectididae, Genus *Atriplectides* (vulture caddis)



Size: Up to 15mm. ■

Habitat: Lakes and rivers amongst deposits of sand and debris where it finds carrion. Uncommon, but very cool.

Movement: Slow moving.

Confused with: Nothing, very distinctive. Notice the way the hind legs are held out of the way when moving, and mainly get used to latch onto food.

| | | |
|------|---|------|
| 7(6) | Case made mainly from coarse sand. | ➡ 8 |
| | Case made from plant material or silk secretion but may incorporate some mineral particles. | ➡ 11 |

| | | |
|------|--|---|
| 8(7) | Case like a messy 'sand igloo'. Larvae fall out easily. Slow moving. | igloo caddis Family Glossosomatidae Genus <i>Agapetus</i> |
| | Case not like a messy sand igloo. | ➡ 9 |

Family Glossosomatidae, Genus *Agapetus* (igloo caddis)



Size: Up to 10mm (mostly less than 5mm). ■

Habitat: Cool flowing waters, forest streams, riffles. Uncommon, but abundant when they do occur.

Movement: Slow moving.

Confused with: Coarser case might look like Tasimiidae, but glossosomatids don't have tapered/triangular cases.

| | | |
|------|---|--|
| 9(8) | Case appears round but is actually coiled like a snail shell. Active but slow moving. | snail caddis Family Helicopsychidae |
| | Case not like a snail shell. | → 10 |

Family Helicopsychidae, Genus *Helicopsyche* (snail caddis)



Size: Up to 5mm. ■

Habitat: Cool flowing water, forest streams, riffles. Rare, but can be abundant.

Movement: Slow moving.

Confused with: Nothing, extremely distinctive ...maybe hydrobiid snails.

| | | |
|-------|--|---|
| 10(9) | Case triangular, often with larger particles down each side. Eyes of larvae protrude when viewed from above. | tasimiids Family Tasimiidae |
| | Case tubular, legs sharp, for grabbing prey. Fast deliberate movement. | attack caddis Families: Philorheithridae/Odontoceridae/Leptoceridae |

Family Tasimiidae (tasimiids)



Size: Up to 10mm ■

Habitat: Small mountain streams, amongst coarse, stable substrate.

Movement: Slow moving

Confused with: Glossosomatidae. Tasimiids have bulgy eyes if you can get close enough to look at their heads and coarser, triangular cases.

Families Philorheithridae and Odontoceridae (attack caddis)



Size: Up to 25mm.

Habitat: Cold flowing water, edges, riffles.
Common but sparse (as are most predators).

Movement: Fast moving.

Confused with: Young leptocerids have a tubular sand case, but they have much longer hind legs.

NB: occurs in a highland and lowland form (different families).

Highlander :Family Philorheithridae (there can be only one)

Lowlander : Family Leptoceridae Genus *Oecetis* sp. sand case form (lower photo)

and Family Odontoceridae (top right photo)

This split is done based on where your site is. (Altitude)

| | | | |
|-------|---|---|----|
| 11(7) | Case made from flat pieces of leaf, giving it a flat appearance overall. | → | 12 |
| | Case made from all sorts, including: silk secretion, sticks, or other plant material and sometimes sand (never leaf plates by themselves). Case not flat. | → | 13 |

| | | |
|--------|--|---|
| 12(11) | Case built from 2 flat pieces of leaf, the dorsal piece is slightly larger forming a 'veranda'. | veranda caddis Family Calamoceratidae Genus <i>Anisocentropus</i> |
| | Case built from many round, shingle-like bits of leaf, in two distinct rows. | shingle caddis Family Calocidae in part Species: <i>Caenota plicata</i> . |
| | Case built from a messy assortment of leaf plates, but still flat. Sometimes tapered quite severely. | flat shack caddis Family Leptoceridae Species <i>Lectrides varians</i> |

Family Calamoceratidae, Genus *Anisocentropus* (veranda caddis, sleeping bag caddis)



Size: Up to 20mm.




Habitat: Slow flowing water, backwaters, edges, in leaf packs. Uncommon.

Movement: Slow moving.

Confused with: Nothing, very distinctive.

Family Calocidae, Species *Caenota plicata* (shingle caddis)



Size: Up to 25mm. 


Habitat: Cool flowing water, forest stream edges.

Movement: Slow moving.

Confused with: Nothing, very distinctive

Family Leptoceridae, Species *Lectrides varians* (flat shack caddis)



Size: Up to 25mm. 

Habitat: Wetlands, lakes and pools in rivers. Common and often abundant.

Movement: Slow ungainly with waiving legs.

Confused with: Case is superficially similar to the shingle caddis, but *Lectrides*' cases are messy and lack the neat double row of leaf plates.

| | | |
|--------|---|--|
| 13(11) | Larvae with short legs, head compact, bullet like. Case often made with rings of different colours, sometimes with sand or may look like orange plastic. Slow moving, never swimming. | bullet caddis Family Conoesucidae/ Calocidae |
| | Larvae with long legs; may swim by thrashing their head about. Case variable. | Family Leptoceridae Go further! →14 |

Families Conoesucidae/ Calocidae/ Helicophidae (bullet caddis)



Size: Up to 13mm.

Habitat: cool flowing water, riffles.

Movement: Slow moving.

Confused with: Young leptocerids; the distinction between long and short hind legs is not as great with juveniles.

| | | |
|---------|---|---|
| 14 (13) | Case constructed from a single stick or piece of aquatic plant. | stick caddis Family Leptoceridae Genus <i>Triplectides</i> |
| | Case constructed like a log cabin, square in cross section (see photo). | log cabin caddis Family Leptoceridae Genus <i>Oecetis</i> |
| | Case with sand or fine gravel at the opening (front) and the rest of the case made from pieces of vegetation. | dart caddis Family Leptoceridae Genus <i>Symphitoneuria</i> |
| | Case made from a variety of materials, may be arranged spirally (but not always). When disturbed animal flails its body in a head-banging motion. | Headbanger caddis Family Leptoceridae Genus <i>Notalina</i> |
| | Not as above. Generally a mix of caddis with long hind legs and mixed messy cases | Family Leptoceridae ...unidentified, various genera. (no further info.) |

Family Leptoceridae, Genus *Triplectides* (stick caddis)



Size: Up to 30mm, larger if the cases are optimistically chosen.

Habitat: Wetlands, lakes, slow flowing sections in rivers. Common and often abundant.

Movement: Ungainly crawl.

Confused with: All stick cases are from the Genus *Triplectides*, but not all *Triplectides* have stick cases.

Family Leptoceridae, Genus *Oecetis* (log cabin caddis)



Size: Up to 20mm.


Habitat: Wetlands, lakes pools in rivers.

Movement: hovers with flailing arms, like a helicopter.

Confused with: Nothing, the case is unique.

Family Leptoceridae, Genus *Symphitoneuria* (dart caddis)



Size: Up to 15mm. 

Habitat: Lower end of rivers.


Movement: Crawls on veg, when dislodged, the case falls like a dart with the heavy end first (the sandy bit).

Confused with: Nothing, case is distinctive.

Family Leptoceridae, Genus *Notalina* (Headbanger caddis)



Notalina are special for the way they move. They thrash their thorax, head and legs back and forth to move through the water. This exhausting movement earns them the name head banger caddis. They always have slender cases. Cases can sometimes be made of spirally arranged bits of vegetation.

Size: Up to 21mm. 

Habitat: Wetlands, lakes and pools in rivers. Common and often abundant.

Movement: Flailing/ headbanging movement as described.

Confused with: Nothing, case and movement are distinctive.

Family Leptoceridae ...unidentified, various genera.

ANYTHING ELSE THAT DOESN'T KEY OUT
(no further info.)

