

Water Bugs and Water Scorpions

Fact Sheet



Water Scorpion. *Laccotrephes* sp. Image: QM, Jeff Wright.

Introduction

To the general public the word 'bug' means any sort of small creepy animal but to professional insect scientists (entomologists), bugs are a specific group of insects belonging to the Order Hemiptera. All members of this Order have piercing and sucking mouthparts and feed on liquid food. On the underside of the head is a feeding tube known as a rostrum. It is a complex structure with a robust outer layer covering a pair of very fine hollow needles (stylets). Only the stylets penetrate the food. One of the stylets delivers saliva while the other functions as a food canal. Most bugs including cicadas, aphids, and stink bugs feed on plant sap.

Some bugs are predators, usually capturing insects and other invertebrates. Many of these are associated with freshwater. Giant Water Bugs (Family Belostomatidae), Water Scorpions (Family Nepidae), Back-swimmers (Family Notonectidae), and Water-boatmen (Family Corixidae) swim in the water, while Water Striders (Family Gerridae) live on the surface, supported by the surface tension. Once the prey is caught it is pierced and injected with saliva. This digests the prey's internal tissues reducing them to a 'soup' to be sucked up and ingested.

All Water Bugs lay eggs and the young that hatch are called nymphs. Bugs undergo incomplete metamorphosis so nymphs look like small adults but do not have wings and cannot fly. Because insects have a rigid external skeleton that must be shed regularly to allow for growth, each nymph goes through a series of moults. At the last moult an adult emerges with fully developed wings, enabling it to fly from one pool to another.

Water Bugs have different methods for accessing and storing air. In some cases this method changes between adults and nymphs. Some draw air from the surface through air spaces between the head and thorax (e.g. Water-boatmen) or via tubes called siphons arising from the tip of the abdomen (e.g. Water Scorpions). Captured air may be stored on the back beneath the wings, or trapped on the underside with specialised hairs. Because water striders live on the surface, they have no specialised respiratory mechanism and are covered with a waterproof veneer of hairs.

Giant Water Bug *Lethocerus insulanus* (Family Belostomatidae)

At up to 70 mm in length, the Giant Water Bug (also known as the Fish Killer bug or Toe Biter) is Australia's largest bug. The body is compact and flattened, with a pair of powerful front legs modified for grasping. Both terminate in a sharp

strong claw, and can be folded so the inside edge of the femur slots into a groove on the tarsus. Their middle and back legs are flattened and fringed with stiff hairs to form very effective oars. Giant Water Bugs are good swimmers but rarely chase after prey. They spend much of their time resting among waterweed with their front legs extended ready to ambush anything that moves past. This is mostly other insects, but they are capable of catching small fish, frogs, and tadpoles.



Giant Water Bug, *Lethocerus insulanus*. Image: QM, Jeff Wright.

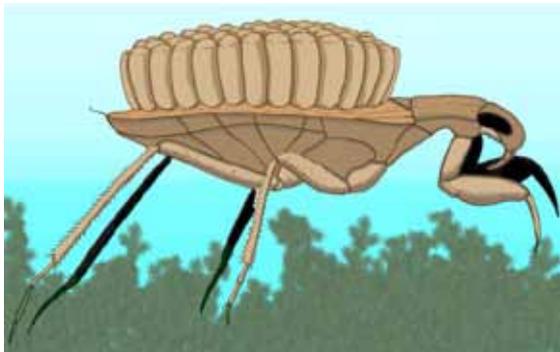
Giant Water Bugs store a thin layer of air in a mat of hairs on the underside of the body. Air is taken in when the tip of the abdomen breaks the surface of the water. This air-store may also act as a gill, extracting oxygen from the water when the bug is submerged. Adult Giant Water Bugs also have an air-store beneath the wings connected to a respiratory structure of long hairs and two air-straps at the end of the body.

These bugs are one of the few insects that look after their eggs or young. Even more interesting, it is the male that is the carer. The female glues a batch of eggs onto vegetation just above the water surface. The male stays in the water at the base of the egg-batch guarding it against predators and, at times, emerges to 'water' the eggs. Eggs left 'unwatered' dehydrate and die, and if completely submerged will also perish.

Giant Water Bugs are often found in swimming pools. Care should be taken if removing them as they can deliver a painful injection of digestive saliva from their piercing rostrum. Adults are attracted to lights and on hot, humid, summer nights, large numbers may mass around streetlights. In Asia, Giant Water Bugs are used as a spice and have a flavour reminiscent of the herb coriander. In some places, they are battered, deep-fried, and eaten as a very chewy, spicy snack.

Diplonychus Water Bugs *Diplonychus* spp. (Family Belostomatidae)

These bugs have a similar appearance and biology to the related Giant Water Bug but are much smaller (15 – 20 mm in length). Paternal care in *Diplonychus* is even more extreme than in Giant Water Bugs as the male carries the eggs on his back. To attract a mate, the male creates ripples on the water. Once the female arrives she will attempt to lay eggs on his back but he will prevent her from doing so until he has mated repeatedly. Alternate egg laying and mating may take over 24 hours by which time the male's back is covered with 50 – 100 eggs. The male stays close to the water surface with the eggs just exposed to the air. He rhythmically brushes the eggs with his hind-legs to circulate water and keep the eggs aerated and clean.



Diplonychus water bug, *Diplonychus* spp. Image: Mark Schutze modified from S. Monteith CSIRO Insects of Australia 1991 fig.30.55 pg. 487.

Water Scorpions *Laccotrephes* spp. (Family Nepidae)

Water Scorpions have a long, fine respiratory siphon at the end of their bodies and front legs modified for grasping which gives them a superficial resemblance to scorpions. Unlike scorpions, it is the rostrum held under the head end that can inflict a painful 'bite'. These insects reach 65 mm in length but half of the total length is made up by the siphon. Water Scorpions live in shallow, muddy water where they may cover their backs with mud and wait concealed for prey. This is mostly insects such as mosquito wrigglers, tadpoles and small fish. Although adults have wings, they are reluctant to fly and are often among the last animals to leave a temporary pool as it dries out.

Each Water Scorpion rests with the tip of its respiratory siphon just breaking the surface of the water to access air. In the adult, the air-store is located under the wings while the nymph has a much shorter siphon and the air-store is under its body.



Water Scorpion, *Laccotrephes* spp. Image: QM, Jeff Wright.

Water Scorpion eggs are unusual in having breathing horns. The female positions the eggs so that they are just submerged with the horns exposed to the air. Air enters an area between the outer and inner layers of the shell. Even when submerged, this allows the egg access to air to survive.

Further Information

Anderson, N.M. & Weir, T.A., 2004. *Australian Water Bugs: their biology and identification (Hemiptera-Heteroptera, Gerromorpha & Nepomorpha)*. Apollo Books, Denmark, CSIRO Publishing, Australia.

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