

## Family Notonectidae

**COMMON NAME:** Backswimmers.

**ORDER:** Hemiptera (true bugs).

**DEVELOPMENT:** Hemimetabolous.

**BODY SIZE:** 5-16 mm in length.

**HABITATS:** Spend almost all of their life in open water and small pools, as well as along streams and lake margins.

**SPECIES RICHNESS:** 11 species occur in California; In North America, there are 34 species distributed among three genera; Most species (and individuals) are in the genus Notonecta.

**GENERAL APPEARANCE:** Differ from all other aquatic insects in that they swim upside down (hence their common name, backswimmers); Commonly found suspended in water at a 45 degree angle, with the posterior tip of the abdomen positioned just below the water surface; Possess stout, wedge-shaped body, with a convex dorsal surface and flat underside; Front and middle legs are short and possess claws, whereas oar-like hind legs are noticeably longer, lack claws, and are angled toward the head; Eyes comprise most of the head; Ocelli are lacking; Antennae are present but inconspicuous.

**SIMILAR TAXA:** Resemble bugs in family Corixidae (water boatmen), but differ in that their dorsal body surface is convex and commonly light colored compared to the flattened dorsal surface with dark narrow crosslines found in the corixids.

**MOUTH PARTS:** Possess piercing-sucking mouth parts consisting of a segmented beak (rostrum); Beak is short and capable of inflicting a powerful bite (humans beware).

**FEEDING MODE:** Exclusively predators, with prey consisting of other insects, tadpoles, small crustaceans, and occasionally small fish; Some species have been used to control mosquitoes, because notonectids often feed on their larvae.

**MOBILITY:** Well-known for being agile swimmers, with oar-like hind legs used to propel individuals in quick, jerky movements; Although best known as swimmers, adults are also good fliers and commonly disperse to new aquatic areas by flying in swarms at night; Individuals can appear in areas quite distant from natural sources of freshwater, such as swimming pools.

**LIFE HISTORY:** In the spring, adults mate and females lay eggs on submerged stems of aquatic plants; Eggs hatch in 2-3 weeks and nymphs develop into adults in about 2 months; There are 1-2 generations per year and adults of the last generation overwinter; Adults commonly remain active during the winter, even in regions where the water surface freezes.

**REPRODUCTION:** When courting females, males of many species make noises ('stridulate') by rubbing their front legs against base of mouth parts.

**ECOLOGY:** Locate their prey primarily by using hair-like structures on legs to detect water movements caused by prey (large eyes are thought to be used primarily to orient prey once captured); Dart after prey and capture them with front and middle legs, which possess claws; Insert beak into prey, inject enzymes that kill prey and digest internal structures, and then suck out digested innards.

Obtain respiratory oxygen primarily from atmosphere; 3 longitudinal rows of hair-like structures on ventral surface of abdomen are used to trap oxygen at the water surface (air bubbles are clearly visible on abdomen); Nymphs must replenish oxygen supply every 3-5 minutes whereas adults can remain under water for hours without resurfacing; As oxygen is removed from air bubbles to meet metabolic needs, more oxygen from surrounding water diffuses into them and nitrogen diffuses out; Eventually air bubbles are so small that adults must resurface and create new air bubbles.