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A Study of the Damselfly: A Predatory Pseudo-Fly

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SUMMARY

Damselflies, belong to the order Odonata and suborder Zygoptera, are flying insects originated during the Lower Permian period and found on every continents except Antarctica. They are having two pairs of equal and membranous wings that differ from true flies. So, damselflies are pseudo-flies. Both the immature naiads and adults are predatory in nature. They have certain modifications in mouth parts and legs suited for prey capture. In naiads, the labium is elongated, jointed and bears two hooks at the apex called as mask which is helpful for the capture of prey. Adults have scooping or basket type of legs which are helpful for carrying the prey. Artificial fishing flies that mimic damselfly nymphs are used in wet fly fishing. The details of two common species pond damsel and spread-wings damselflies are discussed here under briefly.

INTRODUCTION

The Odonates are extant representatives of the first ancient winged insects (Misof et al. 2014). They represent a species rich, yet tractable (6000 described species) insect order, which encompasses two main suborders, Anisoptera (dragonflies) and Zygoptera (damselflies) (Stork, 1988). Most of the Odonata species feed during flight, which is not an easy task despite their being exceptional flyers (Corbet, 1999). Zygopteran nymphs are more effective predators than anisopteran nymphs (Laird, 1956). The damselflies do not belong to the order Diptera, so it is a pseudofly. The adults have slender bodies and generally hold their wings over the abdomen when at rest. Adult damselflies, with their long, slender abdomens, huge eyes and shining, veined wings, are pretty much unmistakable. The naiads are found in a variety of freshwater habitats including acidic bogs, ponds, lakes and rivers. The nymphs feed chiefly on small crustaceans, annelids and aquatic insects including mosquito naiads (Pennak, 1953; Lee, 1967; Collin and Resh, 1985). The damselflies may be used in fishing.

Super-families of suborder Zygoptera

I. Calopterygoidea

- Calopterygidae- Demoiselles
- Chlorocyphidae- Jewels
- Dicteriadidae- Barelegs
- Euphaeidae- Odalisques
- Lestoideidae- Bluestreaks
- Polythoridae- Bannerwings

II. Coenogrionoidea

- Coenogrionidae- Pond damselflies
- Isostictidae- Narrow-wings
- Platycnemididae- White-legged damselflies
- Pseudostigmatidae- Forest giants

III. Lestoidea

- Hemiphlebiidae- Ancient greenling
- Lestidae- Spread-wings
- Perilestidae- Shortwings
- Synlestidae- Sylphs

IV. Platystictoidea

- Platystictidae- Shadowdamsels

Common Species of Damselfly

Pond Damsel Damselfly, *Ischnura heterosticta* (Selys, 1854) (Coenagrionidae)

Pond Damsel damselfly *I. heterosticta* naiads can be found in many types of still water habitats including bogs, fens, ponds, lakes, marshes, sloughs and even brackish and alkaline water and thermal springs as long as vegetationis plentiful. They feed on Chironomids, small crustaceans, mites, beetles, mayflies, and caddisflies. In certain species, cannibalism is common.

After mating, the male and female *I. heterosticta* usually remain in tandem while the female uses her ovipositor to insert eggs into holes cut into vegetation. Males identify potential mates by color, though some females may avoid harassment by sporting a "male" color pattern. *I. heterosticta* Naiads are relatively short and thick bodied as compared to Spread winged damselflies. Gills have light and dark bands; lower lip broad and does not extend beyond second pair of legs when folded under the head. Adults hold wings together over the abdomen and usually held horizontal when at rest. With the exception of Sedge Sprites, adult males (and some females) are blue and black. Females may be black with lighter areas of grey, green or tan Sedge Sprite. The smallest damselfly (< 30 mm long), has metallic green body and abdomen tippedwith light blue.

Photo 1. Pond Damsel damselfly larva

Photo 2. Pond damsel Damselfly adult

Spread-winged Damselfly, *Austrolestes cingulatus* (Calvert, 1901) (Lestidae)

The Spread-winged damselflies, *A. cingulatus* hold their wings partly open when at rest. They usually have some metallic green color on their abdomens. Unlike other odonates, *A. cingulatus* commonly lay eggs in temporary water bodies and overwinter in the egg stage. Naiads hatch in late winter and early spring. After a few weeks of rapid growth, adults emerge before the water dries up. Though excellent swimmers, *A. cingulatus* naiads usually hunt by crawling through dense vegetation. Their preferred prey are Chironomids but they will also capture fly and mayfly naiads, Water Boatmen and ostracods.

While attached to the male, the female *A. cingulatus* usually deposits her eggs in vegetation above or below water by making a small incision in the plant and releasing up to 6 eggs. Some mated pairs dive below the surface to lay eggs. The lower lip of naiad is elongate and stalked (spoon- shaped), extends beyond second pair of legs. The adults are ≥35 mm long with front of thorax and top of abdomen blackish to metallic green. They usually perch with wings spread open at 45º angle and abdomen is pointed downward.

At high dissolved oxygen levels in the water, the *A. cingulatus* naiads can obtain sufficient oxygen through the surfaces of their abdomens. At low oxygen levels, they must use their external gills. The eyes of adults change color from light to dark blue as temperature decreases. Overwintering eggs can survive temperatures as low as -22° C and the naiads can spend several months embedded in ice.

Photo 3. Spread-winged damselfly larva

Photo 4. Spread-winged damselfly adult

CONCLUSION

Damselflies are odonates that are predatory both in immature as well as adult stage. They feed on Chironomids, small crustaceans, mites, beetles, mayflies, mayfly naiads, Water Boatmen, ostracods and caddisflies. Cannibalism is common in some species. They can be used in fishing.

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