



### Meet the Encased Caddisfly: The Tiny Architect of Freshwater

**Encased caddisflies** are an ecologically diverse and important group of freshwater insects that construct cases, or protective homes, out of materials found in rivers and streams. The larva spends up to two years of their lives in streams before they turn into an adult as a flying, air-breathing terrestrial insect. Once an adult, caddisflies live less **than a month** and spend their time reproducing. The larvae are extremely sensitive to pollution and are used as **indicators of excellent water quality**. Dissolved oxygen levels, water velocity and chemical parameters are all important to the survival of the caddisflies.

#### What do they do?

Encased caddisflies are very creative when it comes to protecting themselves from predators in a river ecosystem. With their own **silk** created under their mouth, they construct cases, or homes, built from rocks, leaves, sticks and/or sand. The cases provide **camouflage** for the larva along the stream bottom and protection from predators. Caddisfly larvae are known to be very choosy about what they use to construct their homes and have even been known to select decorative items. Some even choose to build their homes completely out of quartz. Every constructed case is unique to each caddisfly - each piece must fit just right, or it is not used, and they will choose another piece. It takes **up to 24 hours** for a caddisfly larva to construct a case.



### More Details about Caddisflies

- **Protection:** The case provides protection for the larva from predators and helps it in drifting with the current.
- **Material Variation:** The materials used to build the case vary depending on the species, the available materials in the environment, and the current conditions.
- **Life Cycle:** The larva lives in the case during its larval and pupal stages, eventually emerging as an adult caddisfly.
- **Importance:** Caddisflies are a vital part of the aquatic ecosystem, serving as food for various predators.
- **Fly Fishing:** Cased caddisflies are also a common target for fly fishing, with fly patterns designed to mimic the larval stage.
- **Food Source:** Encased caddisflies primarily feed on detritus or decaying matter such as leaves, plant fragments or organic matter.



*Life Cycle of a Pycnopsyche sp.*

Credit: [www.wildscape.com](http://www.wildscape.com)

## Ecological Role of Caddisflies

Caddisflies are essential to the health of freshwater ecosystems. As larvae, they help break down organic matter including decaying leaves and algae. This activity supports the nutrient cycle within aquatic habitats which may include food for fish and other aquatic species.



## What About Free-Swimming Caddisflies or Net-Spinning Caddisfly?

Net-spinning caddisfly larvae build mesh nets in the rocks to filter feed as collector-feeders, collecting particles from water. They do not build cases; however, like the case-builders, they use silk to build the mesh nets as seen below.



**Listen to this episode about case-building caddisflies on NCPR to learn more:**

<https://www.northcountrypublicradio.org/news/story/43265/20210520/natural-selections-the-many-virtues-of-the-silk-making-insect>