

Stream Insects of the Pacific Northwest



FIELD GUIDE

Stream Insects of the Pacific Northwest

Patrick Edwards
2008

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Both in the Opal Creek Scenic Recreation Area

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Purpose

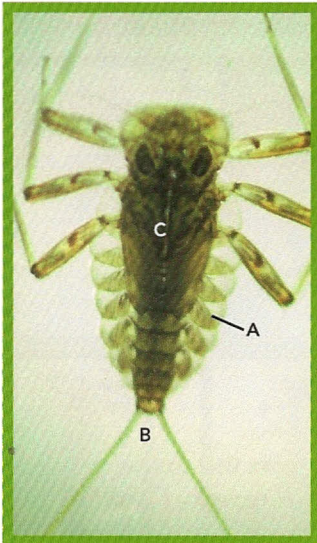
This field guide is designed for streamside identification of aquatic insects commonly found in streams of the Pacific Northwest. It is intended to support studies where the goal is to identify aquatic insects in the field and return them to the stream unharmed. There are many reasons for conducting non-lethal bioassessment. It may be logistically simpler and quicker to return specimens to the stream rather than bringing them to the lab for identification, some groups may not want to preserve insects, or in many cases the characteristics that are most indicative of a particular invertebrate family may be best exhibited by a live specimen.

This field guide relies heavily upon the work of Jeff Adams (Xerces Society, Washington Sea Grant), Rick Hafele (Oregon DEQ), Dr. Ian Waite (USGS), and Dr. Robert Wisseman (Aquatic Biology Associates). It represents an attempt to bring together various taxonomic resources into a regionalized, introductory-level field guide for educators and volunteer groups conducting basic ecological investigations or family-level bioassessment studies. Included within is the latest information on Pacific Northwest taxonomy, pollution tolerance, feeding strategies and habitat requirements.

About This Field Guide

In-the-field or streamside identification of aquatic macroinvertebrates presents a challenging setting for identification and requires a unique taxonomic approach. This guide is based on observations about how experts identify insects in the field, and it is an attempt to transfer those strategies into an introductory-level field guide for educators and volunteers. For example, experienced taxonomists are familiar with the expected size and range of a particular insect and may use this as a key feature in identification. In this guide, scale is communicated by presenting all insects in the same container (an ice cube tray).

Mayfly



Mayfly

Mayfly (Ephemeroptera):

Key Characteristics

- Gills on Abdomen (A)
- 2 or 3 tails (B)
- Thorax is not visibly segmented (C)

Basic Ecology: Mayflies occupy a variety of habitats including ponds, lakes, rivers and small streams. They exhibit a range of pollution tolerance and in some water quality limited streams they can dominate the insect assemblage. In general they are collectors and scrapers feeding on detritus and algae. Mayfly larvae and adults have a short lifespan, and most emerge in the spring and summer. Adults are short-lived and do not feed.



Image 1.22: Mayfly adult

Family Index:



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Small
Minnow
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Prong Gill
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Spiny Crawler
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Spiny Crawler
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Spiny Crawler
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Ameletid
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Square Gill
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Flat Head Mayfly (Heptageniidae)

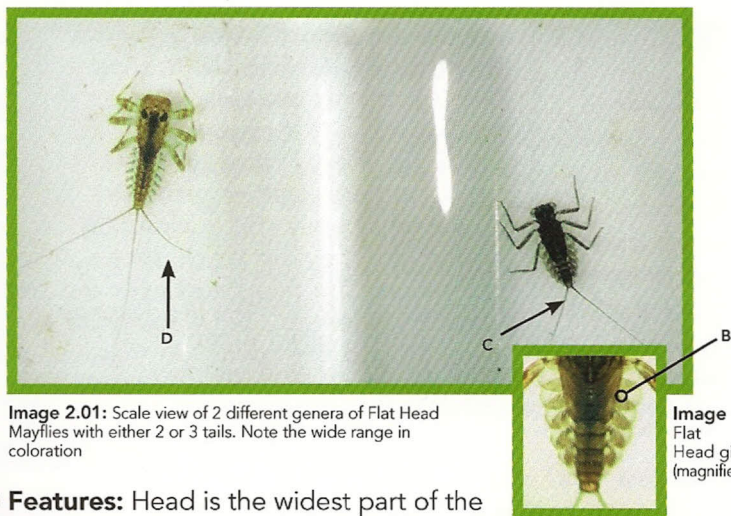


Image 2.01: Scale view of 2 different genera of Flat Head Mayflies with either 2 or 3 tails. Note the wide range in coloration

Image 2.0: Flat Head gills (magnified)

Key ID Features: Head is the widest part of the body (A), gills are oval-shaped, flat and located along the side of abdomen (B).



Image 2.02
Flat Head Mayfly

Field ID Tips: Flat Head Mayflies have a flat-broad body and a large head that is wider than their abdomen (image 2.02). They range in color from light brown to dark black with oval/flat gills on the side of the abdomen (B). The gills are sometimes bright red in coloration. Flat Head Mayflies have two (C) or three (D) tails (image 2.01). When placed in a collection tray, Flat Heads swim poorly in an odd flopping motion. Often confused with: *Small Minnow*

Mayfly (pg. 14) and *Spiny Crawler Mayfly* (pg. 16).

PNW Distribution: Flat Heads are abundant and widespread. There are at least nine genera common in streams and rivers of the Pacific Northwest. Flat Heads can be found year-round. Common genera: *Heptagenia*, *Ironodes*, *Epeorus*, *Cinygmula*, *Cinygma*, *Rhitrogena*

Ecology: Flat Head Mayflies are clingers and typically found on the surface of rocks or on large woody debris where they feed on algae. Their flat, wide bodies are well adapted to life of fast-moving streams. They have a wide mouth with a row of thick hairs that streamline the body. Mouth parts are modified for scraping algae and detritus off the surface of rocks and other substrate. They are moderately sensitive to water pollution, but can be abundant in streams with excessive algae growth.

Functional Feeding Group: Scrapers

Life Cycle: Short-lived

Pollution Tolerance: Moderate

About the Author:

Patrick Edwards is a Ph.D. student in the Environmental Sciences and Management Department at Portland State University, Oregon. He received his B.S. in Environmental Analysis and Planning in 1995 from Frostburg State University in Frostburg, Maryland. In 2001, he received a M.S. in Science Teaching from the Center of Science Education at Portland State University. Patrick's research interests include the effect of excessive fine sediment on aquatic macroinvertebrates, bioassessment and science education. Patrick is currently an instructor in the Science in the Liberal Arts curriculum at Portland State University. He also teaches stream ecology at Trillium Charter School, Portland, Oregon.