Microscopic Life in the Creek

Healthy wild water is literally full of life. The truly microscopic, like bacteria and diatoms, can be suspended in the water column, while those actually visible to the naked eye live down amongst the stream-bottom gravels. They are the base of the food chain that nourishes fish.

In streams that are exposed to a lot of sunlight, the base of the food production chain is algae, which are microscopic plants. Often they will be bound up with cyanobacteria and fungi in a kind of biofilm growing on the rocks – this is referred to as periphyton. This film is grazed by tiny invertebrates and fish. This is called an Autotrophic System.

Winlaw Creek, like most of our swift mountain streams, is not exposed to a lot of sunlight, is quite cold, and the cobbles in the bed tend to move a lot at times of high water. There is very little periphyton to be found. Here the base of the food chain is leaf litter that falls or is washed in along the banks. This is called a Heterotrophic System.

The organic matter is fed upon and broken down by a variety of Benthic Invertebrates. These include the larvae of mayflies (Ephemeroptera), stoneflies (Plecoptera), dragonflies (Anisoptera), caddisflies (Trichoptera), and beetles (Coleoptera). Most of their lives are spent underwater in these larval forms, growing and moulting, till they at last emerge as winged insects to mate, lay eggs, and die.

The Benthic Invertebrates can be organized according to their feeding habits.
SHREDDERS – feed on either live plant material or litter
SCRAPERS – eat periphyton and associated materials
Filtering or Gathering COLLECTORS – eat fine particulate organic matter
PLANT PIERCERS – suck fluids from macro algae and vascular plants
PREDATORS – eat live prey (usually other macroinvertebrates)
PARASITES – depend on invertebrate or vertebrate hosts

Sampling the benthic invertebrate population can tell us a lot about the nature and health of a stream. Studies were done in the 1990s on four of our larger streams (Airy, Winlaw, Lemon and Bonanza) as part of a valley-wide Water Monitoring Program. *(Read the complete "Slocan River Watershed Macroinvertebrate Assessment 1998" in our Resources section)*

The numbers and types of creatures collected showed that the dominant food source in Bonanza was algae. Winlaw had the most diverse assemblage of feeding groups, and the greatest variety of taxa, indications of a system in good health. The proportion of of EPT creatures (Ephemeroptera, Plecoptera, Trichoptera) compared to Chironomids (larvae of various flies and non-biting midges) can indicate whether the creekbed is being impacted by fine sediment – the EPT creatures dwell amongst the gravels and would be suffocated by excessive sediment, while the chironomids are much more tolerant of pollution from many sources.

Larvae of the EPT groups may spend several years in the creek, and grow big enough to be seen with the naked eye. You can find them by carefully moving small rocks, and gently collect them. Put them in a shallow film of water (in a petri dish or white jar lid is ideal) or their fragile bodies will collapse like wet laundry. With low magnification, even just a hand lens, you can see the incredible structures of the cases that caddis larvae build to live in. Each species uses particular materials – from grains of sand to wee tiny sticks. Curious artists have kept live caddis larvae in tanks, and supplied them with alternative building materials – look up Hubert Duprat, caddisfly jewellery! Stonefly and mayfly larvae have beautiful external gills – a pair on each abdominal segment. Fringed, feather or fan-like, they are exotically amazing. And it's all there in the bottom of our creek!