

# NATURE DETECTIVES

Summer 2014

## Mayflies, Stoneflies, Caddisflies Galore

“Eeeew,” Alex yelled. “What are all these bugs? They’re landing in my hair and everywhere! I don’t want them to bite me. Let’s get out of here, Grandpa.”

“Don’t worry, Alex, they won’t bite. They’re mayflies. Fish find them tasty.”

“Are you joking, Grandpa? Maybe flying fish eat them. Really, how can fish chomp them in the sky?”

“Well, Alex, mayflies spend most of their life growing and hiding underwater. There is a bird called a dipper that walks along stream bottoms looking for them there.”

“A bird that walks underwater! That’s crazy. How do dipper birds catch these bugs?”

“Like the saying goes, the early bird catches the worm. Mayflies aren’t worms, but dippers catch mayflies before the insects grow wings. Do you remember how insects have several life stages? Mayflies start off as wingless nymphs. Dippers pluck them from under submerged rocks or catch them crawling around the bottom of streams.

Eventually mayflies grow wings, but their life out of the water is short. The winged adults only live a few hours, just long enough to lay eggs.

### When the mayflies are hatching, the fish are biting...

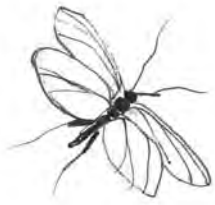
So, I think we anglers should grab our fishing poles, Alex. I’ll tell you more about mayflies as we fish. Stoneflies and caddisflies are similar. Mosquitoes start life underwater too, but mosquitoes are a little different.”

“Yep, I know, Grandpa. The mosquitoes do bite!”



Pull Out and Save





## The Real Hatch

When insects like mayflies swarm out of the water to live the last part of their lives on land, anglers call it a hatch. They try to “match the hatch” with a fishhook disguised as a look-alike bug. (The fake bug hooks are called flies.) As fish gobble the live bugs, anglers hope a good-size fish will snap up their fly.



The real hatch happens when insects hatch out of their eggs as larvae. In the larval stage, they are often called nymphs. The job of nymphs is to eat and grow bigger and avoid being eaten.

Like all insects, those hatched underwater change in stages as they grow to adulthood. The change from egg to adult insect is called **metamorphosis**. As they grow they shed or molt their outside layer. The insect’s outer layer splits and the insect pulls itself out of the whole skin at once.

## Mayflies Are Special Insects

More than 100 different kinds of mayflies live in Colorado. Different types live in streams, rivers, ponds and lakes. Mayfly larvae look a little bit like adult mayflies without wings. Mayflies molt more times than any other underwater insect. Some mayflies possibly molt more than 40 times. After about a year of growing and molting, they leave the water with a lot of other mayflies. Some kinds float to the top of the water, quickly molt, and launch into the air off their shed skin. Others crawl out of the water onto rocks or leaves to molt and fly.



## Mayflies Get Wings Twice

Oddly, even though they now have wings, mayflies will molt one more time. No other insect has a juvenile stage with wings. The sub-adult mayfly has hairy little wings. It flies to a landing spot, and within a few minutes to a few hours the outer skin, including the hairy wing covering, molts off to reveal delicate, clear and shiny wings. Finally the mayfly is an adult...for a really brief time.



## Stoneflies Love Cool Streams

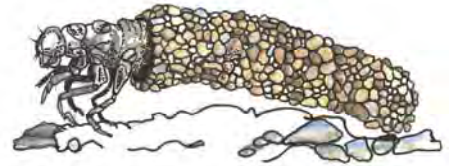
Close to 90 types of stoneflies live in Colorado, but their larvae are found only in running water, especially in high mountain streams where there are lots of rocks.

Stonefly nymphs are similar to mayfly nymphs. Adult stoneflies survive from a week to a month. They hide until dark and spend nights mostly crawling around.



## Caddisflies are Talented Builders

Caddisfly eggs hatch into larvae that look a bit like caterpillars. Most species have a talent for spinning tube-shaped shelters out of silk. Larvae coat the tube with sand, gravel or plant bits, and their head pokes out the front.



After several molts, nymphs spin a cocoon or make their tube into a cocoon (pupa). Inside the cocoon the larvae develop into adults within a couple weeks. At last they break out of their cocoon and float to the top of the water or to the water's edge to take flight. During their month-long adulthood they fly mostly at night, and they often cluster around lights like moths. Colorado has almost 200 kinds of caddisflies.

## Speed Dating

Mayflies live only about a day as adults. They don't eat. They don't even have a mouth. Their job is to find a mate and lay eggs. Mayfly swarms make pairing up easy. Each female checks out the males flying in a group swarm. If the swarm is flying in a particular mayfly dance pattern at the right time of day, the female recognizes it as her species and joins the swarm. They lay eggs in the water then the adult mayflies die.

Caddisfly males swarm in a pattern too but not as noticeably, unless you are a female caddisfly.

Stonefly females don't watch for the right dancing flight. They wait to sense the males drumming. Males drum by tapping the end of their bodies on leaves or twigs. Each species of stonefly has its own beat. The female drums back, matching the beat. They crawl toward each other, pausing to drum, until they find each other.

## Nymph Feeding Frenzy

Nymphs survive by eating bits of things in the water. Some gather tiny plant bits from the water and others scrape plant pieces off rocks. A few types eat tiny animals.

Unlucky nymphs are eaten by fish such as trout, by other insects and by birds such as ducks. **Dippers** can grab a caddisfly larva by its head and shake it out of its tube. Salamanders and frogs find the insects tasty. Bats feast on the flying adults, as do swallows and other birds.



## Pollution Monitors

Caddisfly, mayfly and stonefly larvae need clean water to live.

They are so sensitive to pollution in the water that scientists developed a method of measuring the health of streams by looking for nymphs of the three insects in the water.



# Water World Exploration

Since every living thing needs water, there is a good chance you will see something interesting whenever you are near the water's edge. It is also fun to explore life under the water.

With the help of an adult buddy, you can make an **underwater viewer** out of a 32 oz. can or a half-gallon paper milk carton. Ask your adult to remove both ends of the container. Stretch clear plastic wrap tightly over one end and tape it all around the sides with duct tape or vinyl tape.

In shallow water, put the covered end into the water and look into the open end. You should be able to see the bottom more clearly because you are looking through less water with your underwater viewer. The viewer also eliminates the glare of light off the water.

**Caution:** Never try to look for water critters without a responsible adult with you. Streams can be deeper and currents stronger than they look. Remember that all water can be **dangerous**.

## Underwater Word Search

Find the words from the column on the right. Words go up, down and diagonally.

L	Q	A	O	O	M	T	U	C	L
M	V	N	U	F	E	P	N	O	I
R	Y	G	E	Y	T	U	D	C	N
A	L	L	M	L	A	G	E	O	S
W	F	E	A	F	M	I	R	O	E
S	E	R	Y	S	O	J	W	N	C
U	N	P	F	I	R	R	A	F	T
A	O	U	L	D	P	D	T	I	I
C	T	P	Y	D	H	I	E	S	A
X	S	A	I	A	O	P	R	H	V
F	P	I	T	C	S	P	S	F	R
R	Q	C	L	W	I	E	N	A	A
M	H	R	Z	K	S	R	M	T	L

- ANGLER
- CADDISFLY
- COCOON
- DIPPER
- FISH
- HATCH
- INSECT
- LARVA
- MAYFLY
- METAMORPHOSIS
- PUPA
- SILK
- STONEFLY
- SWARM
- UNDERWATER

