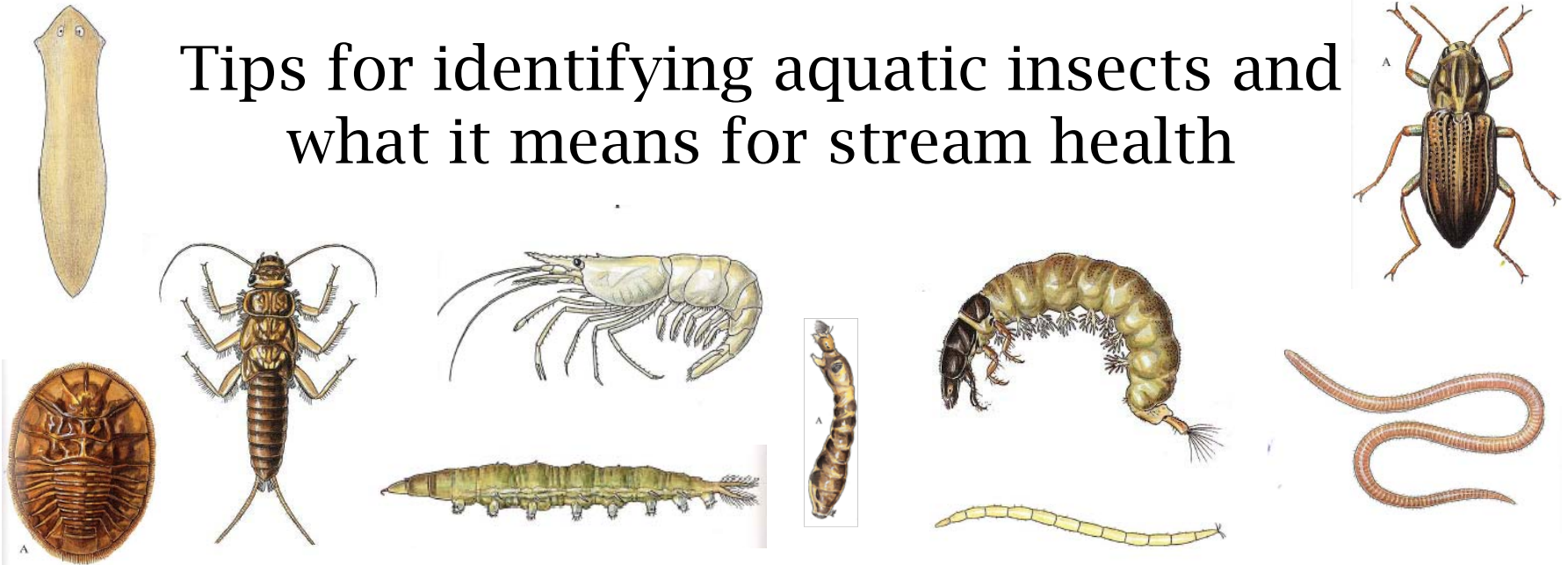


Macroinvertebrate Mayhem!

Tips for identifying aquatic insects and what it means for stream health





WHY BUGS?

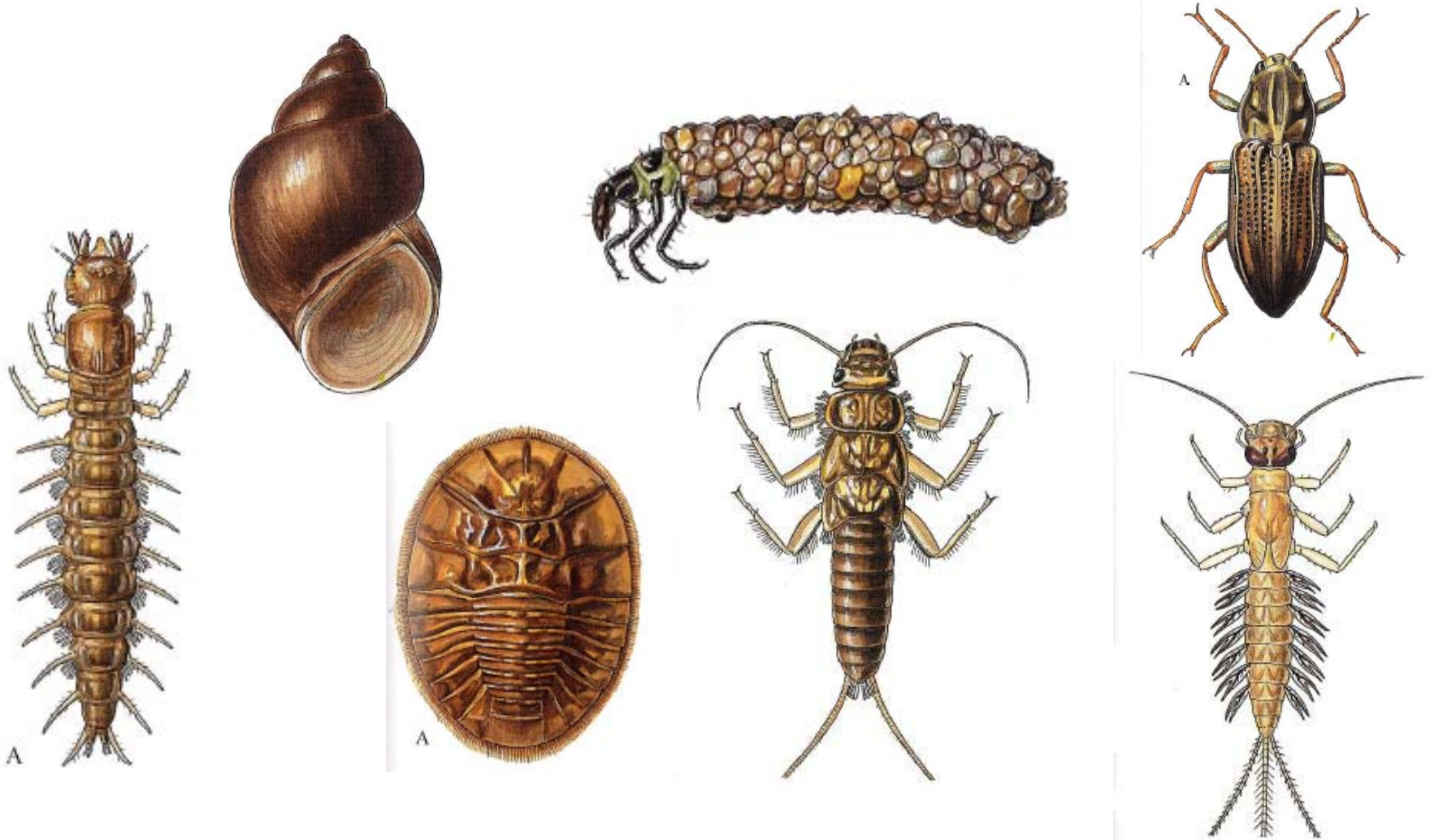


Benthic Macroinvertebrates are good indicators of water quality because:

- They live in the same portion of the stream most of their lives
- Certain macroinvertebrates are more sensitive to pollution than others
- These particular invertebrates are sampled because they can be seen with the naked eye



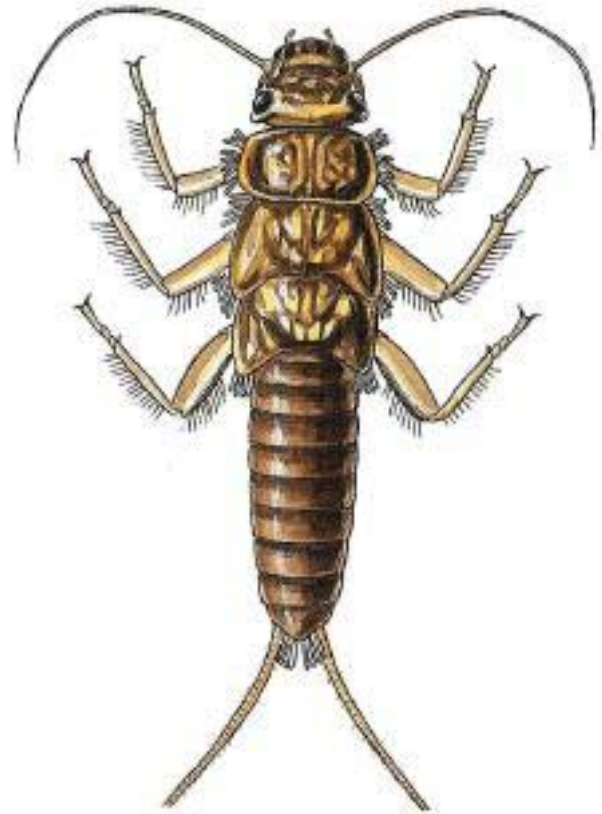
POLLUTION INTOLERANT: extremely sensitive to pollution





STONEFLY

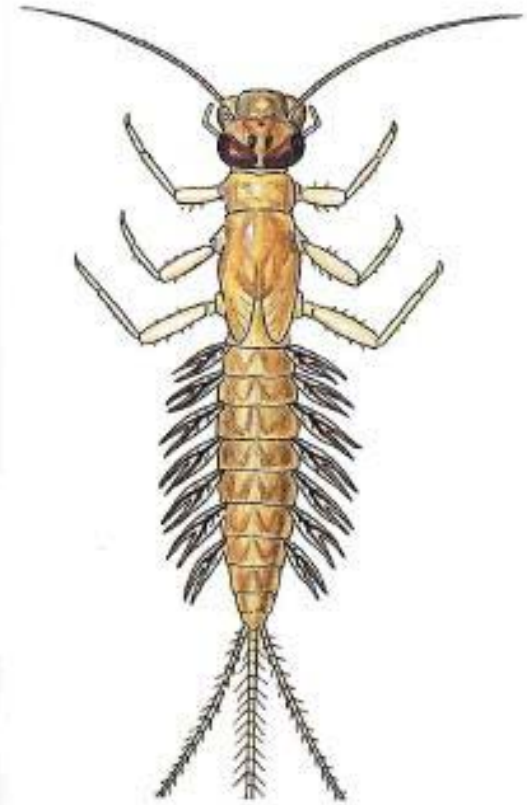
- Found in cool, clean streams with high levels of dissolved oxygen
- Two long antennae
- Two hair-like tails
- Wing pads present, often very visible
- Six segmented legs on middle section of body





MAYFLY

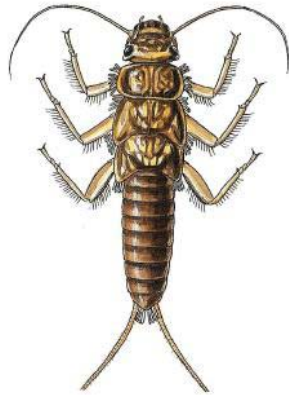
- Live buried in soft stream beds
- Three long hair-like tails
- Plate-like or feathery gills along the side of the abdomen
- Six segmented legs on middle section of body



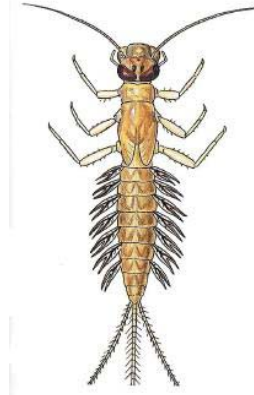


COMPARISON

STONEFLY

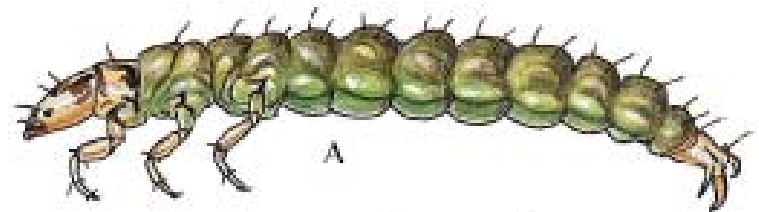


MAYFLY



CADDISFLY

- Make houses of rocks, sand, leaves, or twigs, or may make no case
 - Very small or no antennae
 - Six segmented legs on upper-middle section of body
 - Two small, thick extensions at each end of the body, and each has a hook at the end
- **May be out of the case when found



GILLED SNAILS

- Shell opening has operculum (plate like door)
- Having gills requires good water quality (*gills=good*)
- Shell opens to the right when the tip of the shell is pointing up and the opening is facing you



**It is important to make sure that the snail is in its shell before counting it

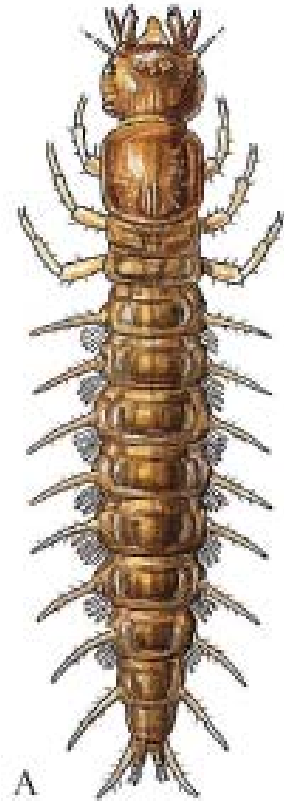
WATER PENNY

- Flattened bodies that are oval, almost circular
- Easy to identify, as name gives a good description of their appearance



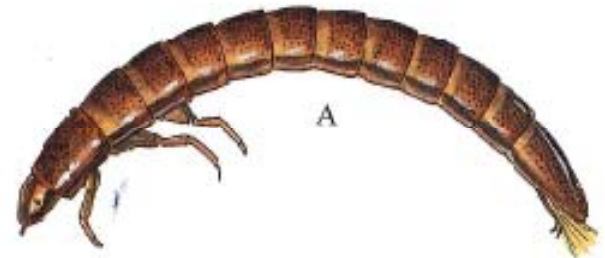
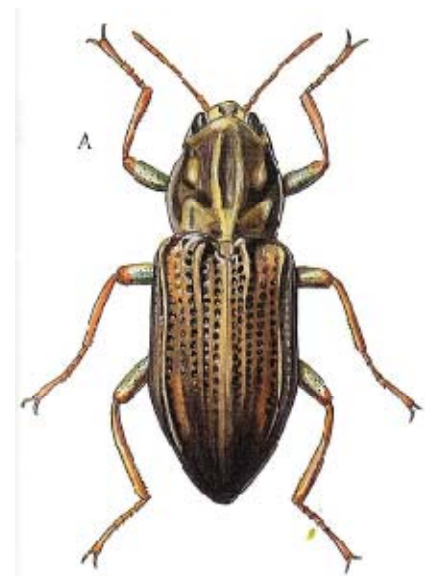
DOBSONFLY

- AKA, hellgrammite
- Head is large with robust, toothed jaws that project forward
- Lateral filaments along body
- Short, fleshy, prolegs with hooks at end of body



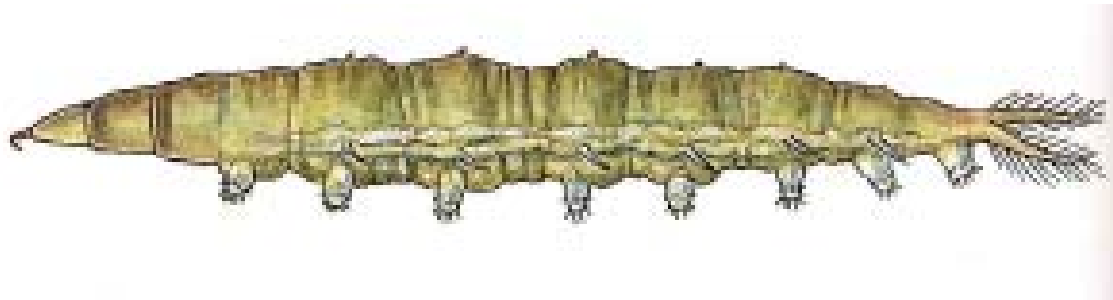
RIFFLE BEETLE

- Both adult and larvae are aquatic
- Adults: hard bodied, cylindrical, usually dark brown or red-brown with various metallic tints
- Larvae: elongate, cylindrical, usually dark brown or red-brown with six legs



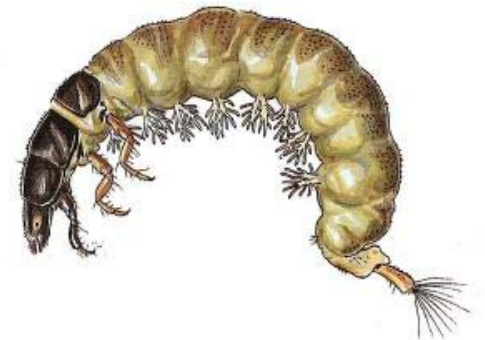
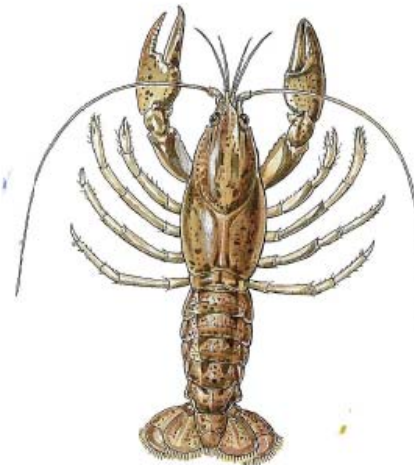
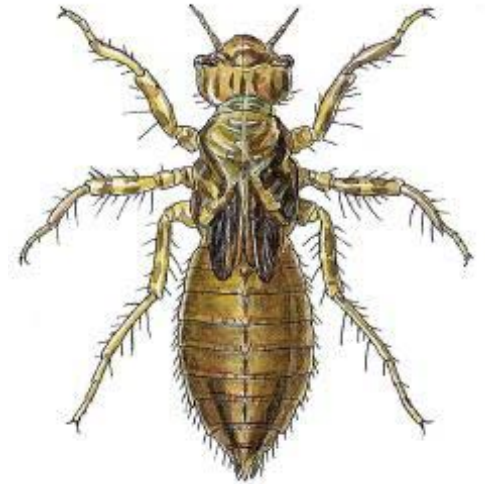
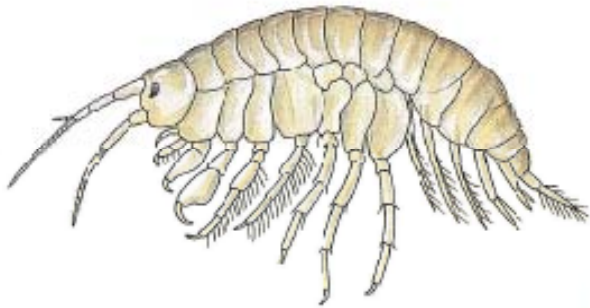
WATERSNIPE FLY

- Head small, often hidden from view
- 8 pairs of fleshy prolegs
- Posterior with 2 pointed, feathery protrusions longer than prolegs





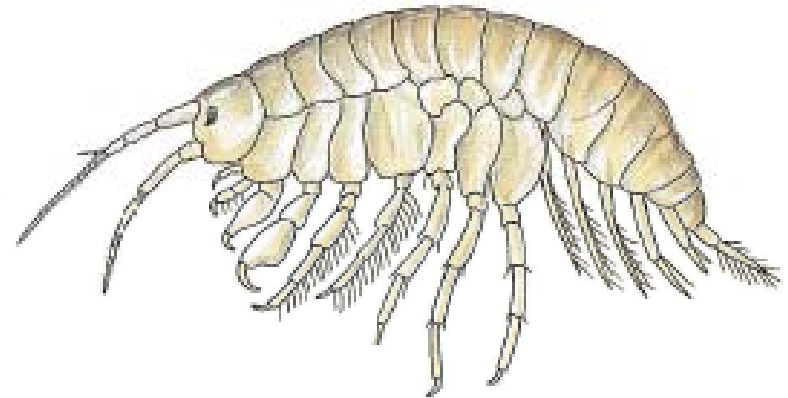
POLLUTION SENSITIVE: somewhat sensitive to pollution





SCUD

- AKA, side swimmer: swim rapidly on their sides
- Body is flattened from side to side
- Are usually found where there are plants in the water
- Seven pairs of segmented legs
- Color: creamy, translucent, light gray, or brown
- Hard, plate-like shell





SOWBUG

- Seven pairs of legs
- Dark brown or gray in color
- Two pairs of antennae, one pair much longer than the other
- Distally flattened
- In large numbers indicates organic enrichment





COMPARISON

SCUD



SOWBUG





CRANE FLY

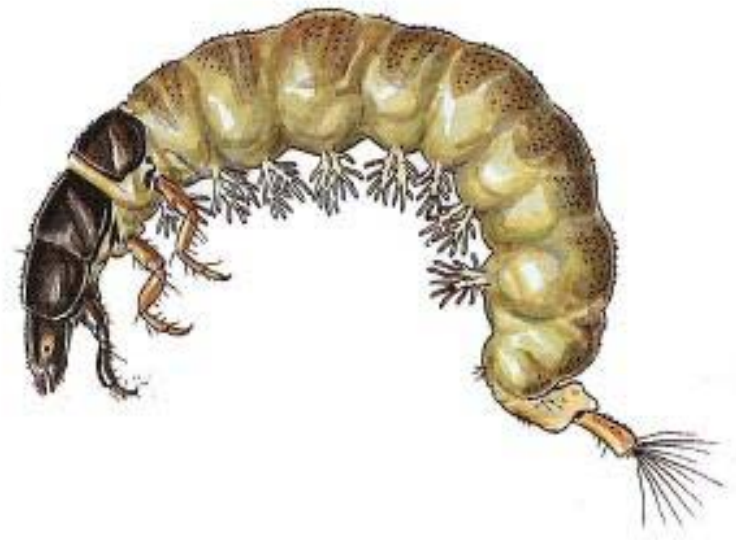
- No legs, worm-like body
- Head small, often hidden from view
- Fleshy protrusions at posterior end
- Color: translucent, white, brown





NET SPINNING CADDISFLY

- Have 3 hardened, darker plates on each thorax segment
- Branched filamentous gills on bottom of abdomen
- Often curled in tight 'C' shape

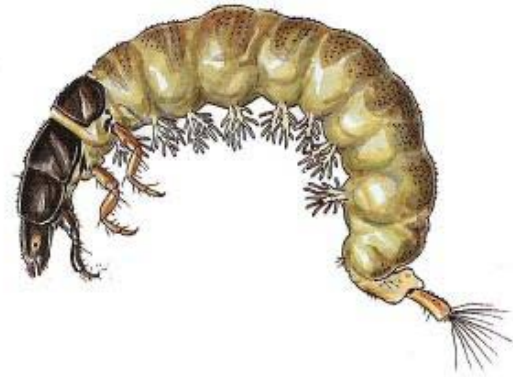
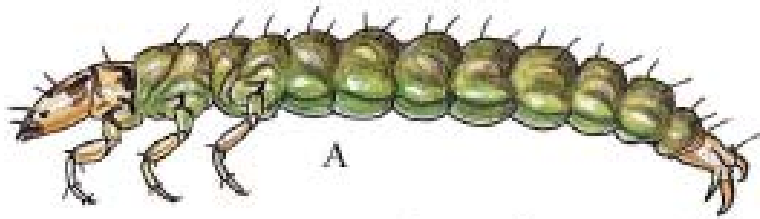




COMPARISON

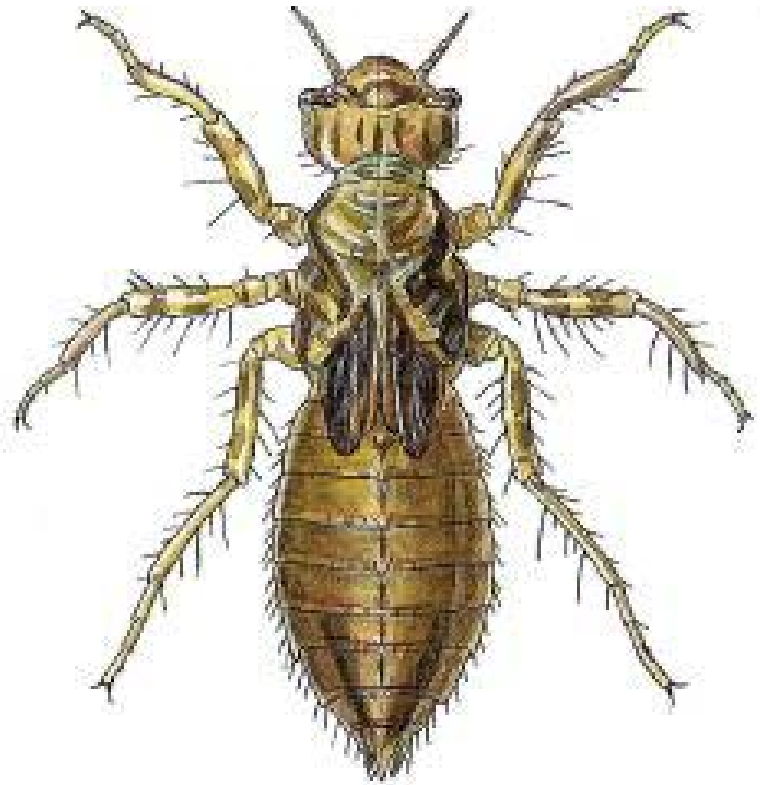
CASE BUILDING CADDISFLY

NET SPINNING CADDISFLY



DRAGONFLY

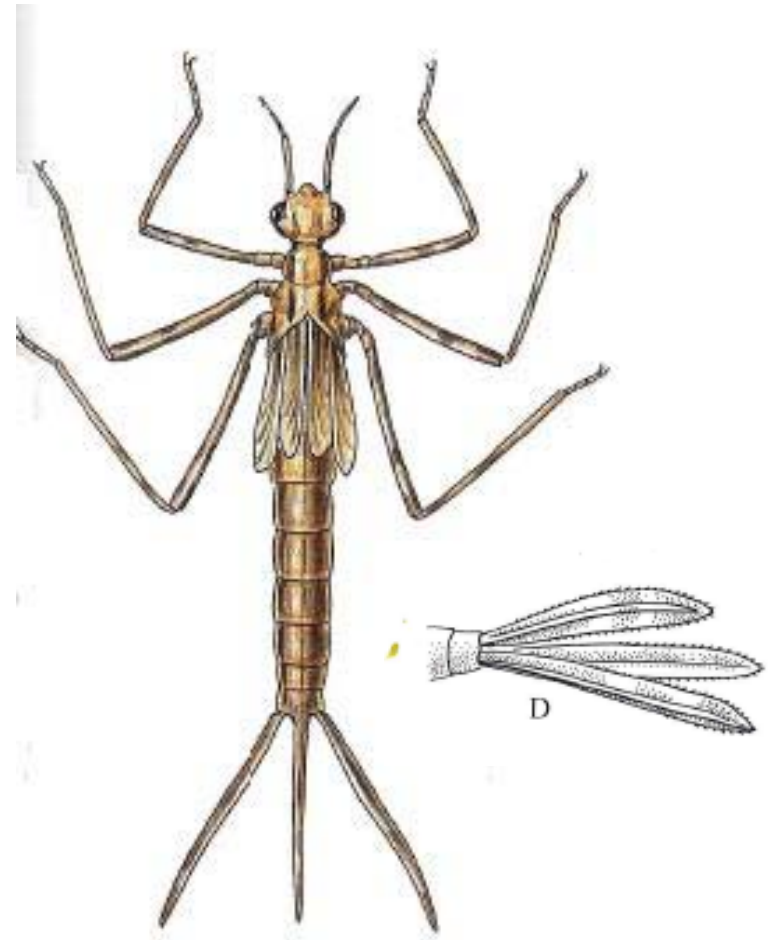
- Large eyes
- Large scoop-like lower lip
- Wide oval or round abdomen
- Six long segmented legs on upper middle section of body





DAMSELFLY

- Large eyes
- Six long spindly legs on upper middle section of body
- Narrow body with three oar-shaped tails (gills) that look like fans



CLAMS & MUSSELS

- Hard shell
- Shell may feel smooth or rough
- If alive, two pieces of the shell will be closed together (bivalve)

**ensure that shell pieces are closed for clam or mussel to be counted



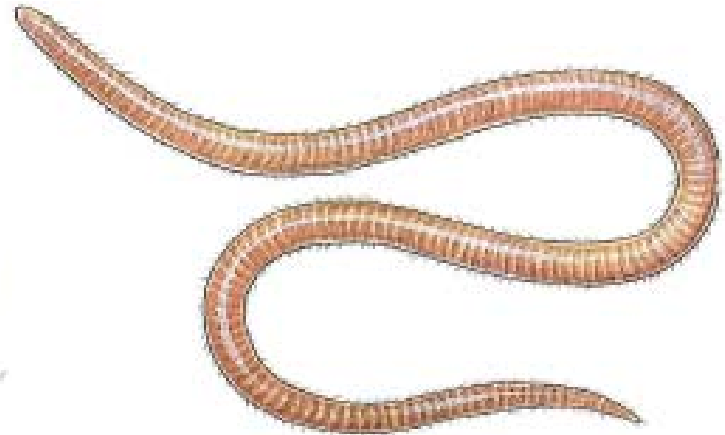


POLLUTION TOLERANT: not very sensitive to pollution



AQUATIC WORM

- May be red, tan, black or brown
- Can look like an earthworm or be much narrower and thread-like
- When found in large numbers indicates an organically polluted stream



LUNGED SNAIL

- Shell is spiral, coiled, or dome shaped
 - Shell opens to the left when the tip of the shell is pointing up and the opening facing you (*left = lunged*)
 - Can get oxygen from air trapped in their shell so they are less dependent on water quality
- **It is important to make sure that the snail is in its shell before counting it





COMPARISON

GILLED SNAIL



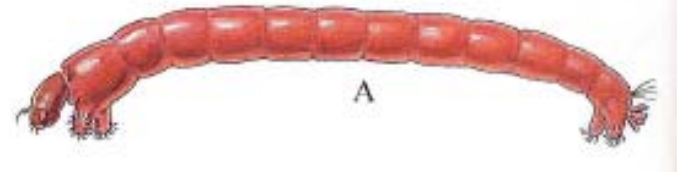
LUNGED SNAIL





MIDGE FLY

- Have narrow, elongate bodies that are snake-like in appearance
- Both ends similar width
- Color: creamy white, red
- Lacks hairs except at last segment of abdomen





BLACK FLY

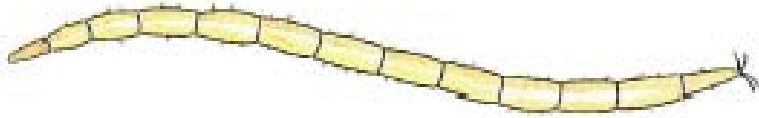
- Posterior 1/3 of body is enlarged = bowling pin shape
- *bowling pin* = *black fly*
- Often stuck to substrate by rear end
- Clumps of hair on top of the head





COMPARISON

MIDGE FLY



BLACK FLY





LEECH

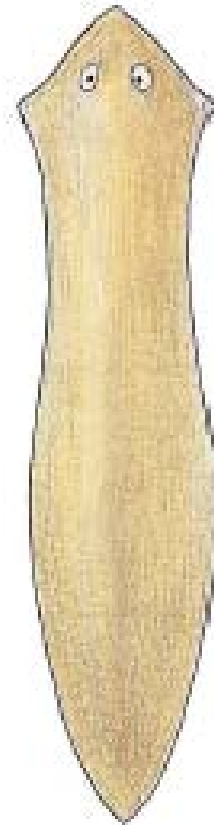
- Worm-like segmented body
- Body is somewhat flattened
- Suckers on the underside at both ends
- Are mainly scavengers that feed on other invertebrates





FLATWORM

- Body is soft, elongate, flattened from top to bottom
- No segments
- Triangular, arrow-like shaped head
- Two eyespots on top of the head
- Color: dark gray, brown, or black



QUESTIONS?

