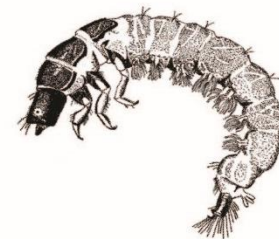
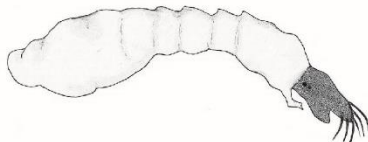
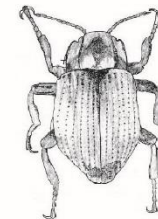
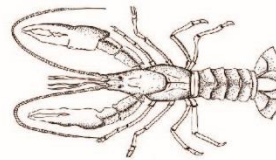
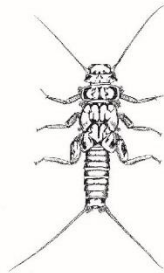
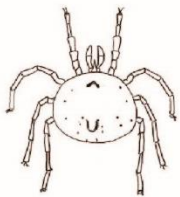


# Identification Guide to Freshwater Macroinvertebrates

© Stroud Water Research Center



# Major Characteristics of Aquatic Larvae

## GLOSSARY

**Abdomen:** posterior body segment(s) of insect

**Dorsal:** the top surface, the back

**Filaments (tail):** hair-like structures

**Jointed leg:** true legs, legs capable of bending

**Lateral:** at the side

**Portable case:** structure made of leaves, twigs, or sand that some caddisfly and midge larvae carry with them

**Posterior:** tail end of the body

**Prolegs:** short leg-like structures (not jointed)

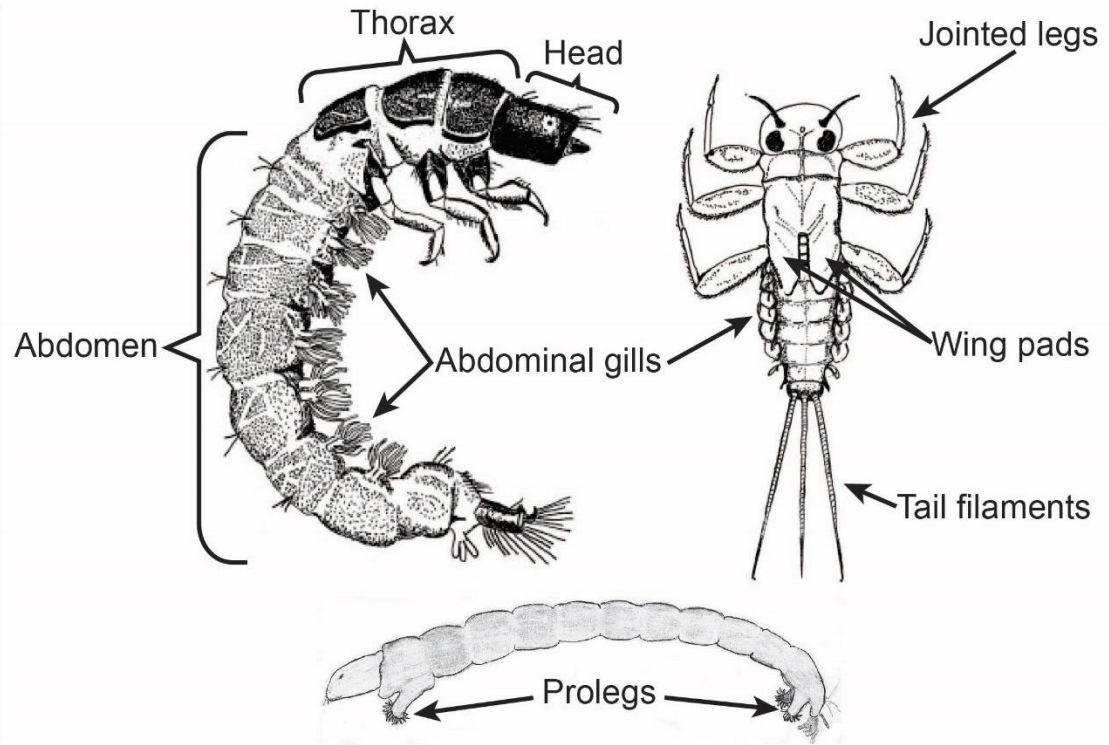
**Protrusion:** part of the body that sticks out

**Segment:** a section of body

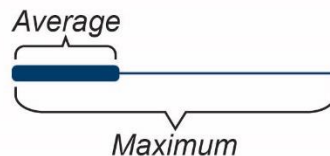
**Thoracic:** the middle region between the head and the abdomen

**Ventral:** underside

**Wing pads:** developing wings, often W in shape



## Approximate Size Range

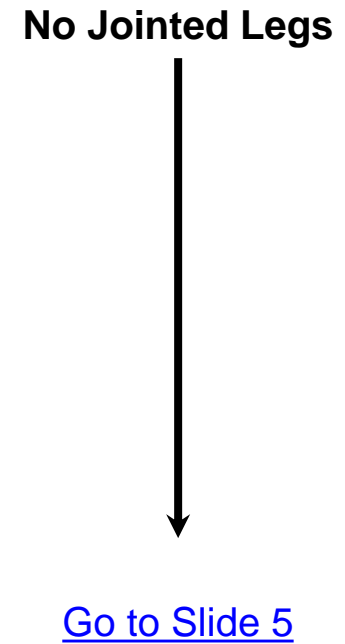
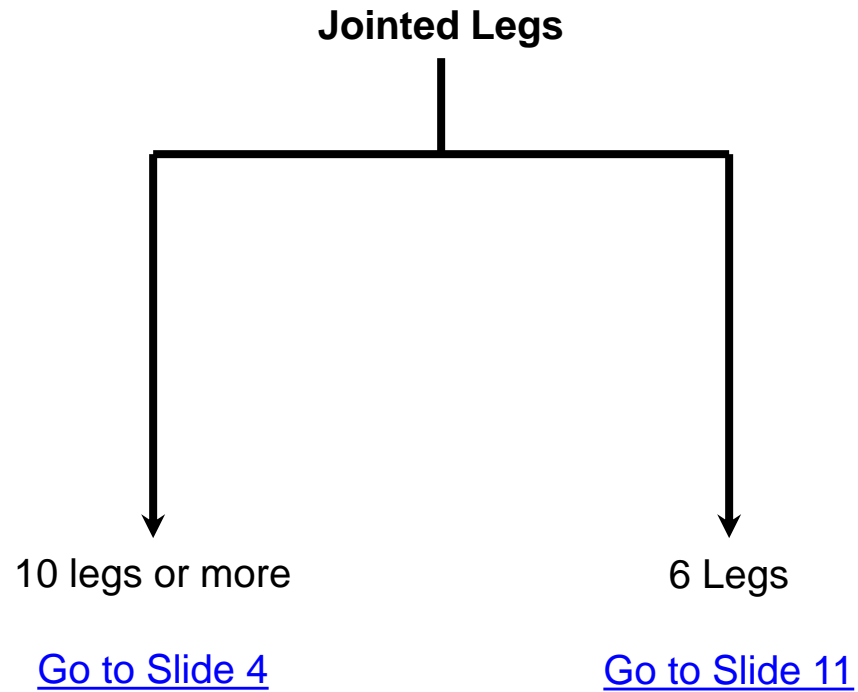


## Pollution Tolerance

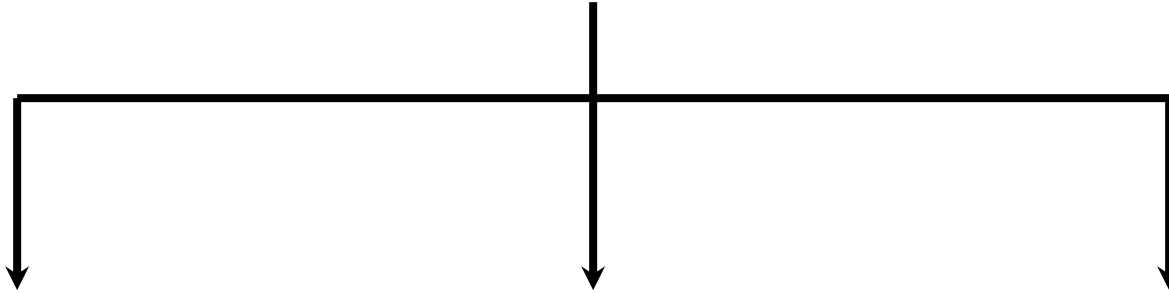
Sensitive (S)

Somewhat Sensitive (SS)

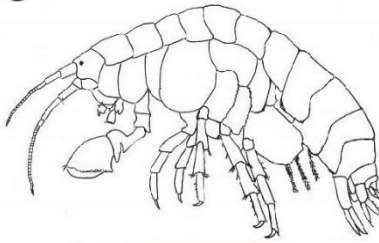
Tolerant (T)



10 Legs or More

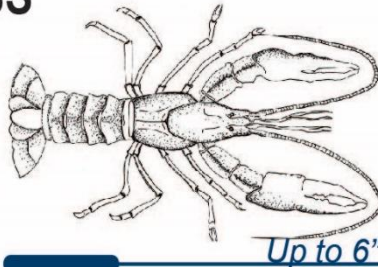


SS



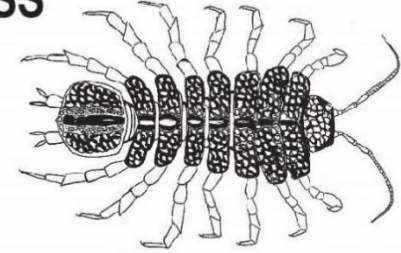
**SCUDS**  
*Amphipoda*

SS



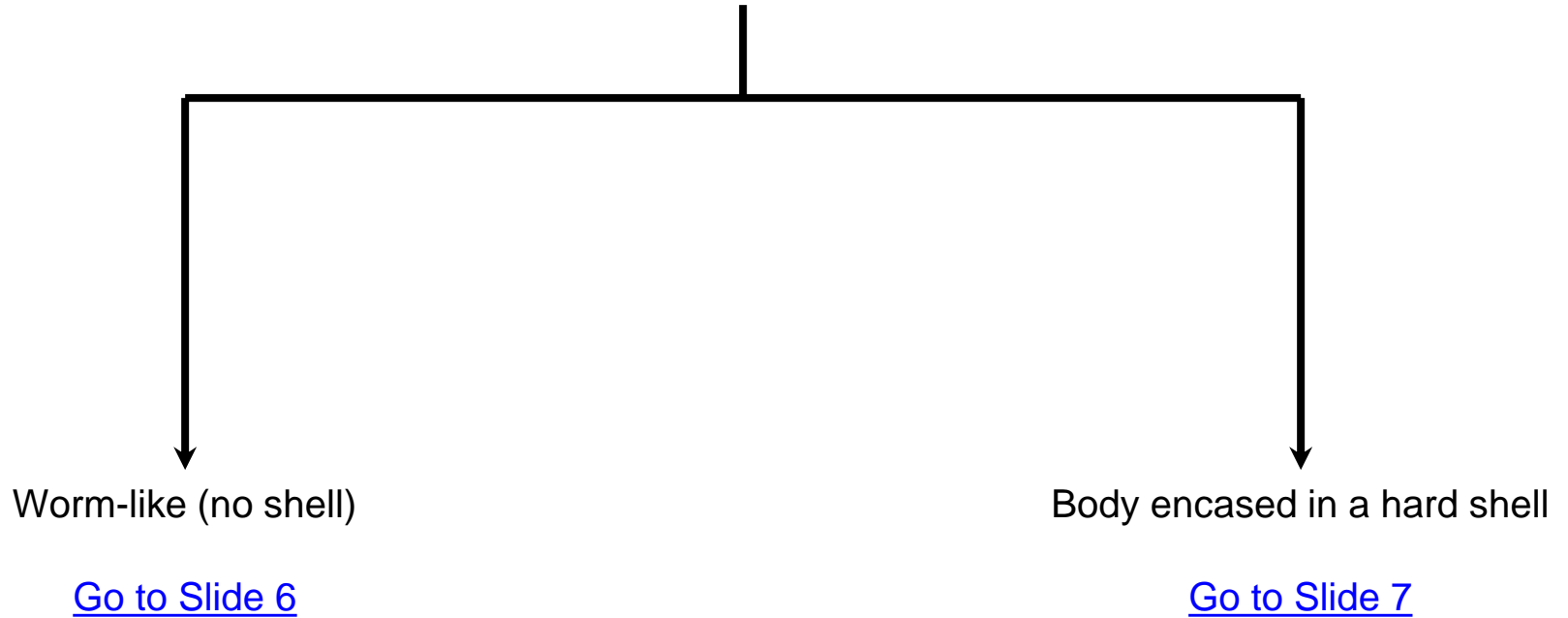
**CRAYFISH**  
*Decapoda*  
*Crustaceans*

SS



**SOWBUGS**  
*Isopoda*

No Jointed Legs



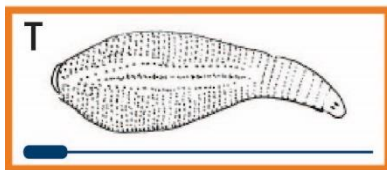
## Worm-like (No Shell)

Segmented Worms

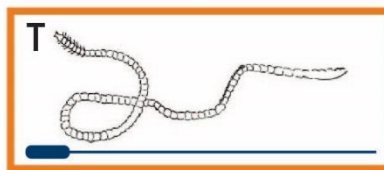
Head and/or fleshy protrusion

Non-segmented worms/flat-worm

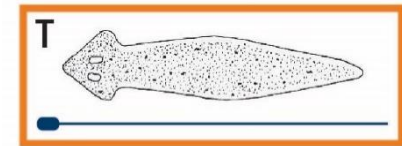
[Go to Slide 8](#)



**LEECHES**  
*Hirudinea*

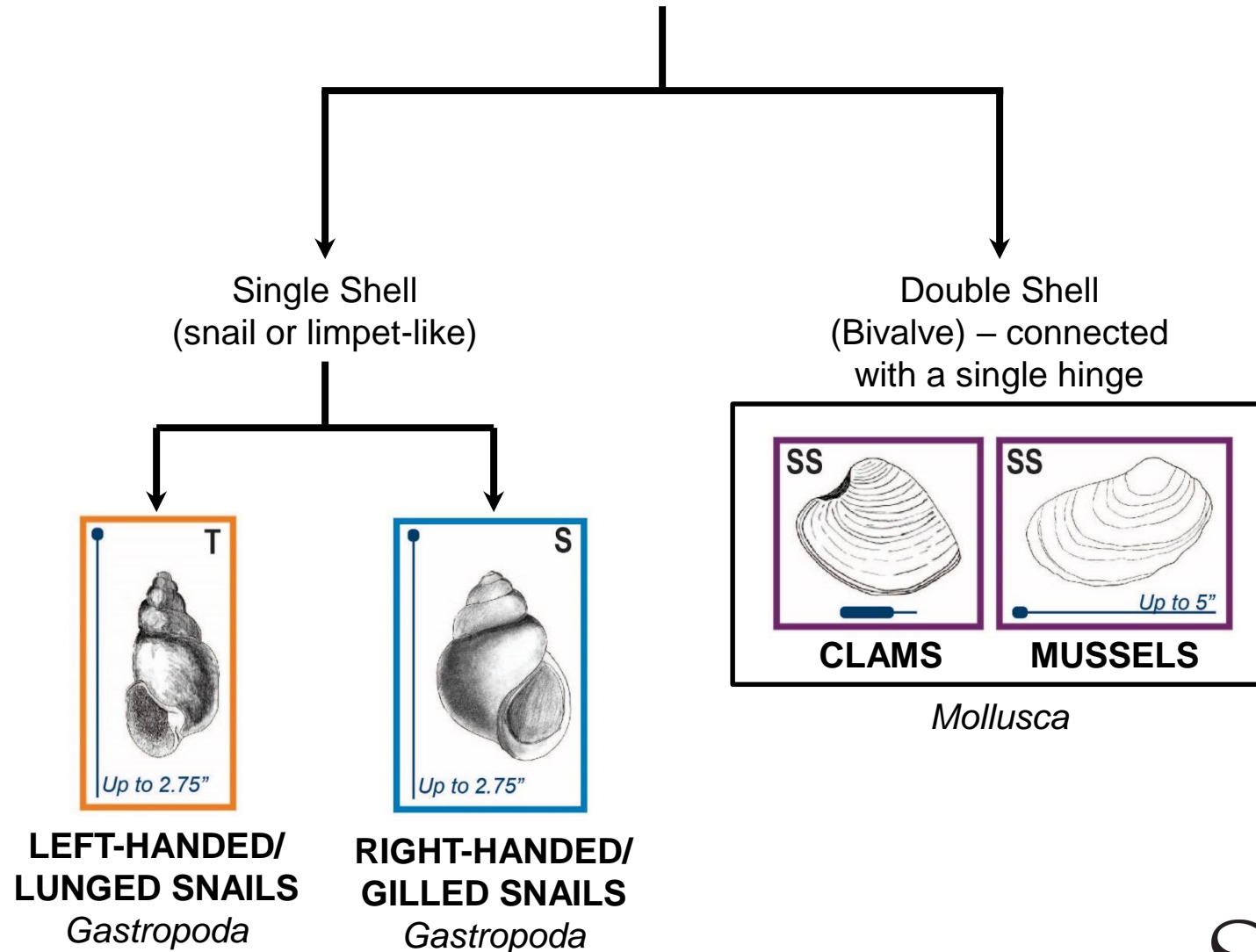


**AQUATIC WORMS**  
*Oligochaeta*



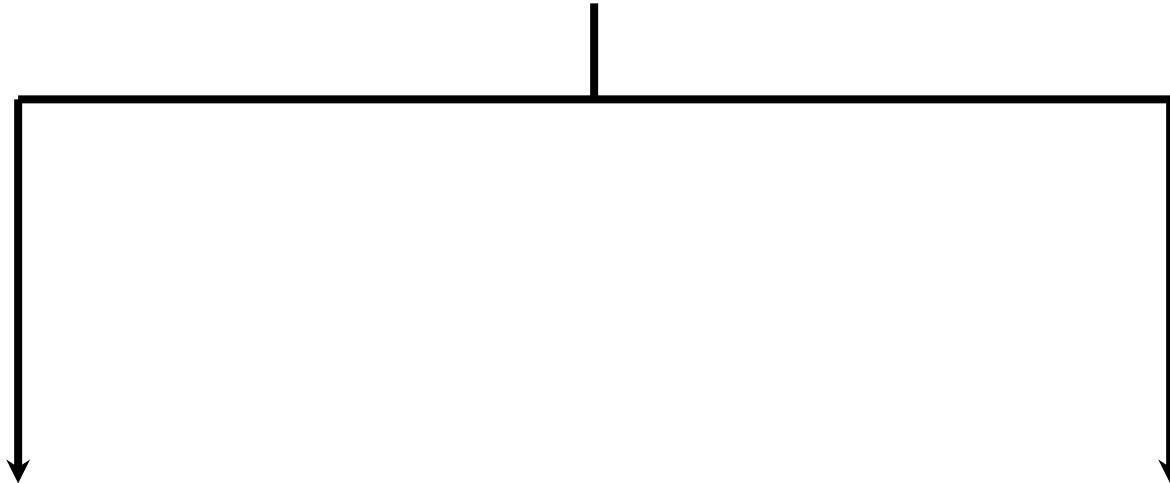
**PLANARIANS/FLATWORMS**  
*Turbellaria*

## Body Encased in a Hard Shell



**Worm-like with Distinct Head or Fleshy Protrusion**

**DIPTERA** *True Flies*



Small head often hidden from view

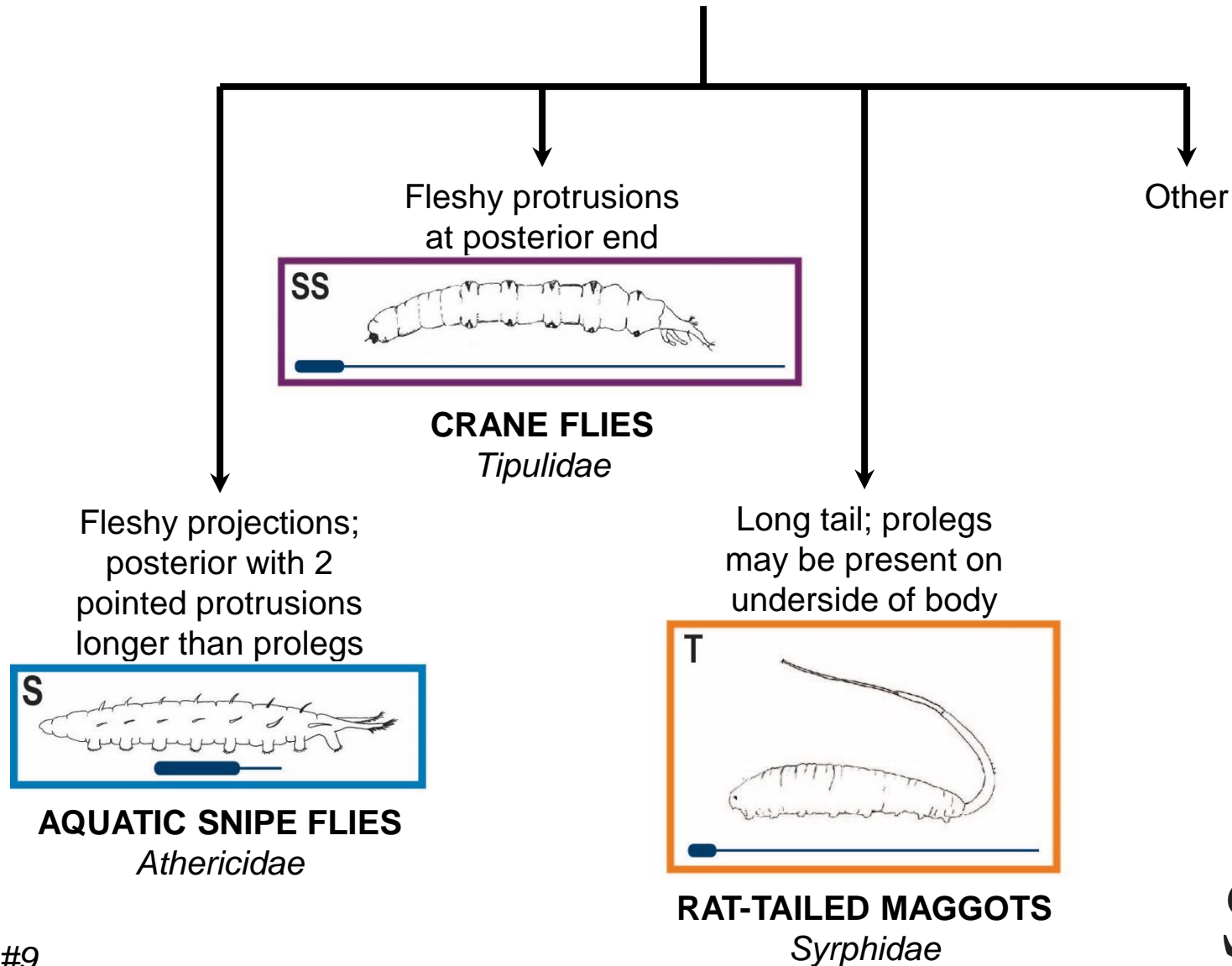
[Go to Slide 9](#)

Distinct head

[Go to Slide 10](#)

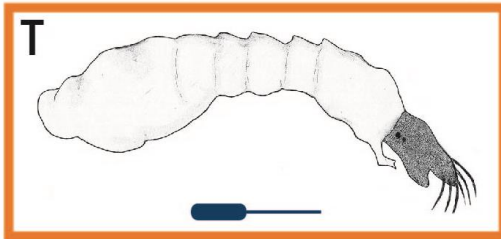


## Small Head Often Hidden From View



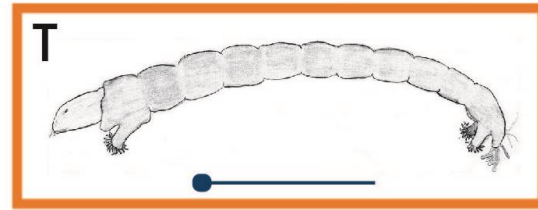
## Distinct Head

One end wider than other;  
no posterior prolegs



**BLACK FLIES**  
*Simuliidae*

Both ends similar width; small  
anterior and posterior prolegs



**MIDGE FLIES**  
*Chironomidae*

## 6 Jointed Legs

No portable case

Portable case (made of sand,  
gravel, or plant material)

[Go to Slide 12](#)

No observable wings  
or wing pads

[Go to Slide 12](#)

Wing pads or wings  
present

[Go to Slide 14](#)

Portable Case

No Observable Wings or Wing Pads

Observable hooks  
at end of body

No observable hooks at end of body

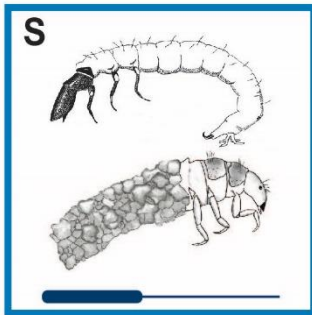
[Go to Slide 13](#)

Without lateral filaments

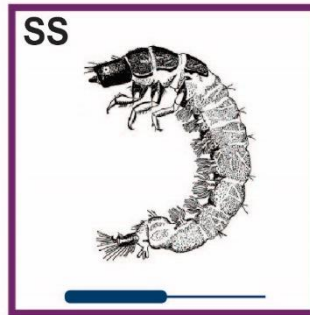
With lateral filaments

No branched gills

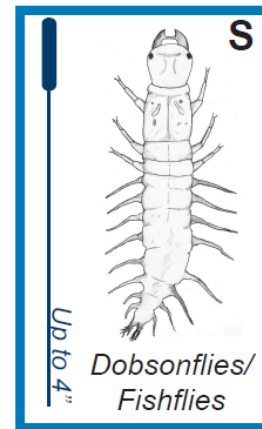
Branched gills on underside  
of abdomen; dorsal plates on  
all three thoracic segments



**OTHER CADDISFLIES**



**NET-SPINNING CADDISFLIES**



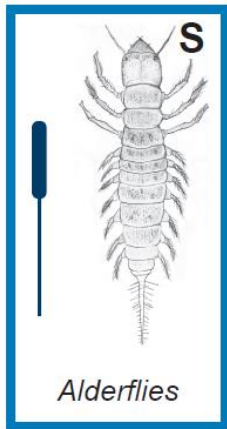
**DOBSONFLIES/FISHFLIES**

*Megaloptera*

*Trichoptera*

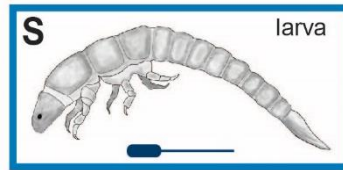
No Observable Hooks at End of Body

With lateral filaments;  
body ends in a  
single, long filament

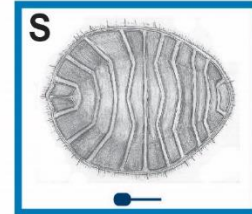


**ALDERFLIES**  
*Megaloptera*

Without lateral filaments



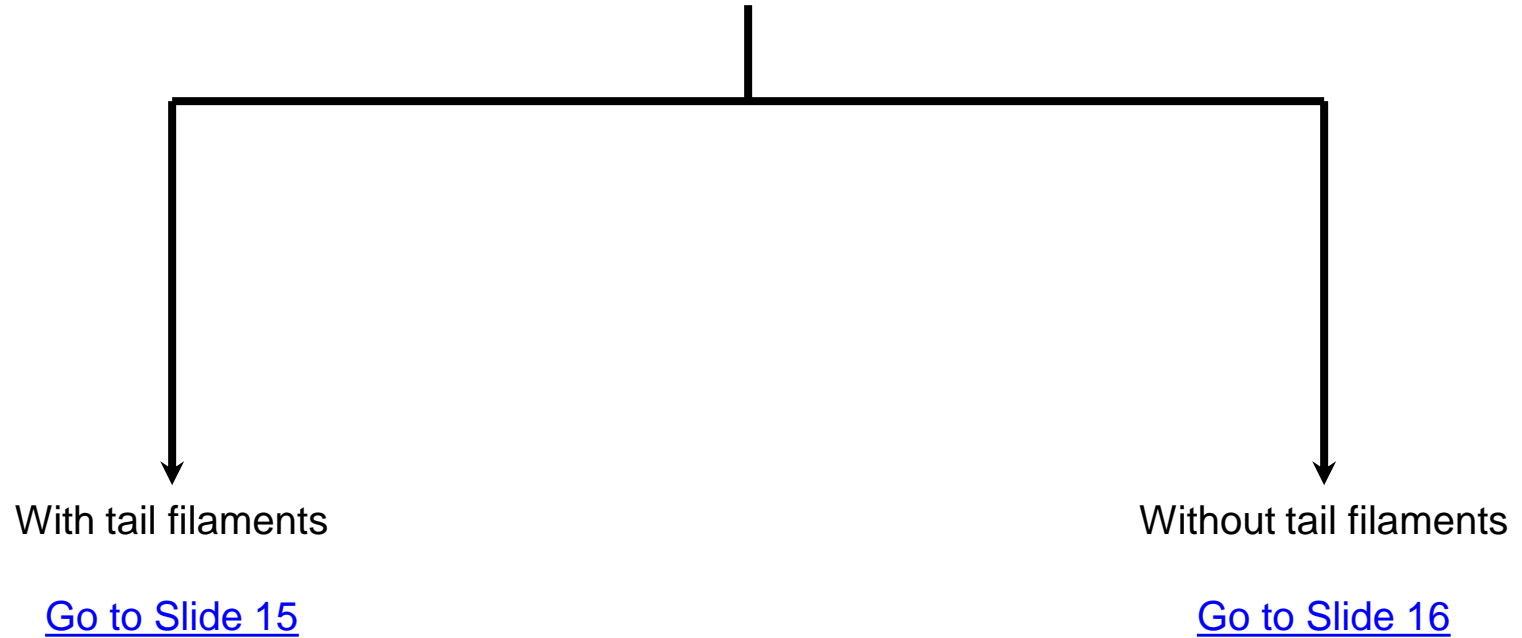
**RIFFLE BEETLE LARVAE**  
*Elmidae*



**WATER PENNIES**  
*Psephenidae*

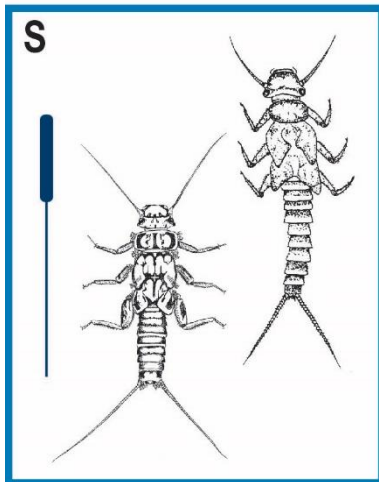
*Coleoptera*

**Wing Pads or Wings Present**



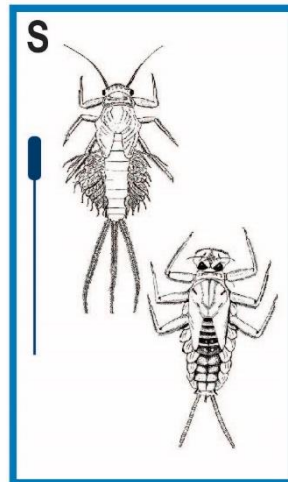
## With Tail Filaments

Two tail filaments,  
without  
abdominal gills



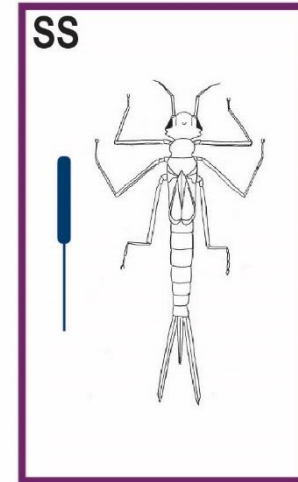
**STONEFLIES**  
*Plecoptera*

Two or three tail  
filaments, with  
abdominal gills



**MAYFLIES**  
*Ephemeroptera*

Three flat tail filaments,  
without abdominal gills;  
large hinged mouth



**DAMSELFLIES**  
*Odonata*

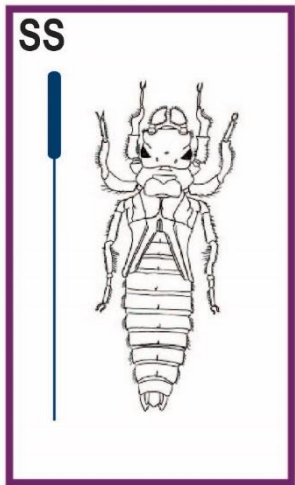
## Without Tail Filaments

Wing pads

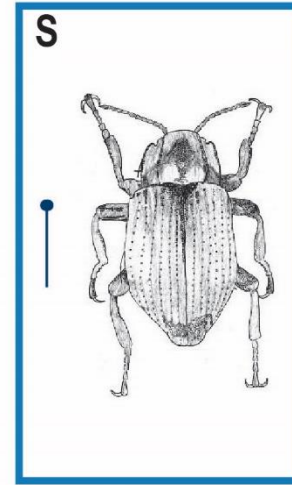
Wings

Large, hinged  
mouth

Hard wing coverings  
with centerline



**DRAGONFLIES**  
*Odonata*



**ADULT RIFFLE BEETLES**  
*Elmidae*