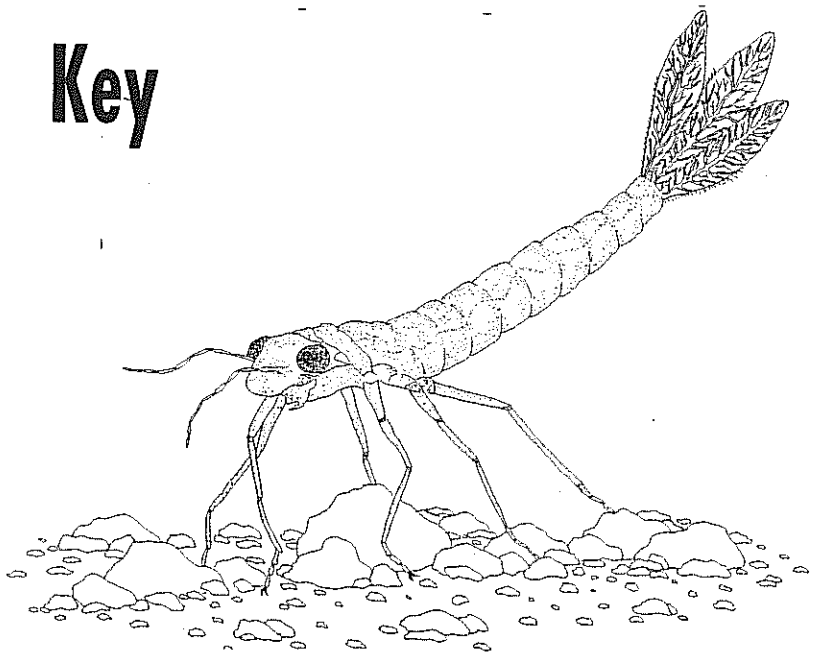
Macroinvertebrate Key



COLORADO RIVER WATCH NETWORK

Mary P. Gilroy

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► APPENDIX B: THE KEY TO BENTHIC MACROINVERTEBRATES

This is a general guide to the most common macroinvertebrates found in the lower Colorado River and its tributaries. It is designed to be used by monitors of all ages. It is not intended to replace a more detailed key, such as those written by Merrit and Cummins, Pennak or McCafferty. These are referenced in the guide itself, and are recommended for anyone interested a higher level of macroinvertebrate taxonomy

This is a dichotomous key. To use it, you must make a series of choices to match the observable traits of the organism you are trying to identify. Always start at the beginning of the key for each organism, and follow the numerical choices until you reach a name and a diagram. You will find descriptions of habitat and general characteristics of organisms in Appendix C: Macroinvertebrate Classification to double check your identification.

As you continue to work with the benthic population particular to your site, this process should get easier. Remember to preserve your specimens with taxonomic labels in the jars so LCRA staff can verify the identification as well.

1a. Animals living in a hard, limy shell, with soft body.....7

1b. Animals without a limy shell.....**2**

2a. Jointed legs present, but may not be functional. Hard or soft body.....**10**

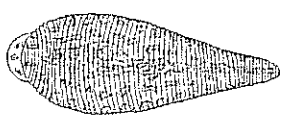
2b. Jointed legs absent, body covering mostly soft and pliable (a hardened head capsule may be present.....**3**

3a. Body banded by rings or creases (segments) at regular intervals, these segments are much wider than long.....**4**

3b. Segments present or absent, if present, not much wider than long.....**5**

4a. Body with suction disk at one or both ends, length usually less than 10X its width.

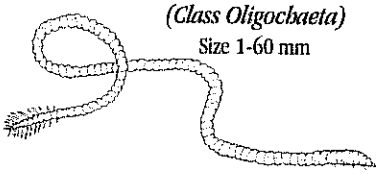
LEECHES (Phylum Annelida, Class Hirudinea)



Leeches
(Class Hirudinea)
Size 5-50 mm

4b. Body without suction disks, length usually more than 10X its width, hairs or bristles sometimes evident.

SEGMENTED WORMS (Phylum Annelida, Class Oligochaeta)



Aquatic Earthworm
(Class Oligochaeta)
Size 1-60 mm

5a. Body unsegmented, long and slender, evenly tapered to a fine point at one end.

ROUNDWORMS (Phylum Nematoda)

5b. Body otherwise..... **6**

6a. Body flat, elongate or oblong; unsegmented head is often spade shaped. Pigmented eyespots on dorsal surface of head. Often looks cross-eyed.

FLATWORMS/PLANARIA

(Phylum Platyhelminthes, Class Turbellaria)

Planaria
(Class Turbellaria)
Size 5-30 mm

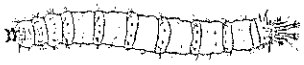
6b. Body segmented, cylindrical, oblong, capsulelike; may or may not have a head capsule and thick fleshy knobs on underside.

FLY LARVAE (Phylum Arthropoda, Class Insecta, Order Diptera)

Dipterans are often easy to identify to family, so diagrams and descriptions of families are listed below:

6b1. No distinct head. Body ends in disk with eye-like spiracles. Disk is fringed with hairs and often with fleshy lobes.

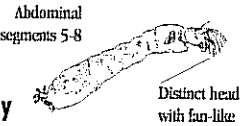
CRANE FLIES (Family Tipulidae)



Crane Fly
(Family Tipulidae)
Size 10-50 mm

6b2. Unique 'bowling pin' shape, with swollen abdominal segments 5-8. Often abundant, attached to surface of rocks. Distinct head with fanlike hairs.

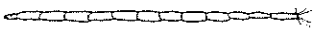
DEER FLIES (Family Simuliidae)



Blackfly
(Family Simulidae)
Size 2-8 mm

6b3. Very long slender, hairlike body, often wiggling horizontally

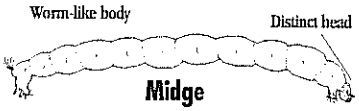
BITING MIDGES (Family Ceratopogonidae)



Biting Midge
(Family Ceratopogonidae)
Size 2-15 mm

6b4. Narrow wormlike bodies with distinct head; look closely for one pair of prolegs on first thoracic and last abdominal segment. Characteristic 'wiggler' movement

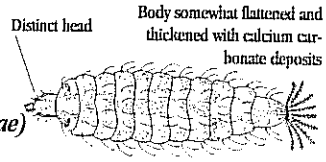
MIDGES (Family Chironomidae)



Midge
(Family Chironomidae)
Size 2-30 mm

6b5. Small distinct head on hard somewhat flattened body, often appearing stiff and lifeless. Circle of hairs on posterior end.

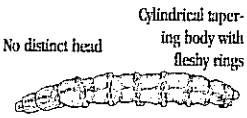
SOLDIER FLIES (Family Stratiomyidae)



Soldier Fly
(Family Stratiomyidae)
Size 10-50 mm

6b6. No obvious head or prolegs, cylindrical maggotlike body with fleshy rings, whitish, yellowish, greenish or brownish.

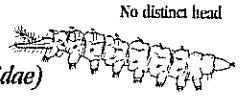
DEER FLIES (Family Tabanidae)



Deerfly
(Family Tabanidae)
Size 15-40 mm

6b7. Elongated body, with head mostly retracted into thorax. Well developed prolegs end in tiny hooks on underside of abdomen. Two long, fringed filaments are at end of abdomen. *Uncommon*

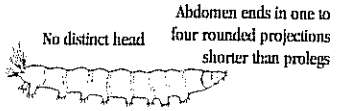
SNIPE FLIES (Family Athericidae)



Snipe Fly
(Family Athericidae)
Size 10-18 mm

6b8. No distinct head, well developed prolegs on underside of abdomen. Abdomen ends in1 to 4 rounded projections. *Uncommon*

DANCE FLIES (Family Empididae)



Dance Fly
(Family Empididae)
Size 2-7 mm

7a. Shell consisting of two hinged halves **8**

7b. Shell entire, usually spiral..... **9**

8a. Shell with toothed hinge, triangular in shape, outer surface heavily ridged. (Introduced from China)

ASIATIC CLAMS (Phylum Mollusca, Class Pelecypoda, Genus *Corbicula*)

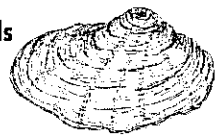
Asiatic Clam
(Class Pelecypoda)
Size 10-50 mm

8b. Shell with membranous hinge, shell shape variable.

NATIVE CLAMS AND MUSSELS

(Phylum Mollusca, Class Pelecypoda)

Native Clams/Mussels
(Class Pelecypoda)



9a. Spiral opening on the right side

GILLED SNAIL

(Phylum Mollusca, Class Gastropoda, Family Lymnaeidae)

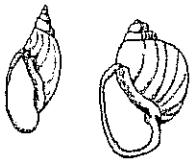
Gilled Snail
(Family Lymnaeidae)
Size 10-40 mm

9b. Spiral opening on the left side, air breathers.

POUCH SNAIL

(Phylum Mollusca, Class Gastropoda, Family Physidae)

Pouch Snail
(Family Physidae)
Size 10-25 mm



10a. Body with functional legs..... **11**

10b. Body without functional legs,
mummy or capsulelike,
living in a cocoon.
Pupae of Class Insecta

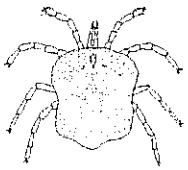
Black Fly
(Order Diptera, Family Simulidae)

11a. Body with three pairs of legs. Larvae, nymphs, adults of Class Insecta..... **17**

11b. Body with more than three pairs of legs..... **12**

12a. Very small, often red. Body compact, spiderlike,
with four conspicuous pairs of legs.
WATER MITES
(Phylum Arthropoda, Class Arachnida)

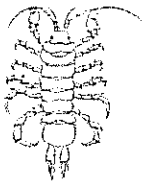
Water Mite or Hydracarina
Less than 3 mm



12b. Body with at least five conspicuous pairs of legs (Class Crustacea)..... **13**

13a. Body flattened horizontally, body with three or more joints.
SOWBUGS
(Phylum Arthropoda, Class Crustacea, Order Isopoda)

Sowbug
(Order Isopoda)
Size 5-20 mm



13b. Body compressed laterally or not, but never flattened horizontally..... **14**

14a. Eyes on stalks..... **15**

14b. Body compressed laterally, coiled with a slight hump in the back.
Eyes, if present, seen only as spots on sides of head.
SCUDS (Phylum Arthropoda, Class Crustacea, Order Amphipoda)

Scuds
(Order Amphipoda)
Size 5-20 mm

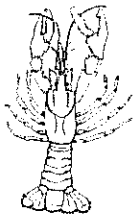
15a. Pincers on first pair of legs..... **16**

15b. No obvious pincers on first pairs of legs
FAIRY SHRIMP
(Phylum Arthropoda, Class Crustacea, Order Anostraca)

Fairy Shrimp
(Order Anostraca
Size 10-45 mm

16a. Body flattened dorsoventrally (top to bottom). Pincers strong and large, other legs stout and used for walking.
CRAYFISH
(Phylum Arthropoda, Class Crustacea, Order Decapoda)

Crayfish
(Order Decapoda)
Size 10-150 mm



16b. Pincers thin and flattened, used for swimming. *Very uncommon.*

OPOSSUM SHRIMP

(Phylum Arthropoda, Class Crustacea, Order Mysidacea)

All animals from this point on in the key are Phylum Arthropoda, Class Insecta

17a. Animal flealike, with forked projection on underside. *Uncommon.*

SPRINGTAIL (Order Collembola)

17b. Animal otherwise.....**18**

18a. Long segmented filaments at end of body and wing pads present.....**19**

18b. Long filaments absent, or if present, not segmented.....**20**

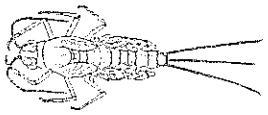
19a. Two long tail filaments, usually without abdominal gills, two claws on each 'foot'.

STONEFLIES (Order Plecoptera)

Stonefly
(Order Plecoptera)
Size 5-35 mm

19b. Three tail filaments, middle filament may be very reduced, abdomen usually with gills, usually one claw on each 'foot'.

MAYFLIES (Order Ephemeroptera)

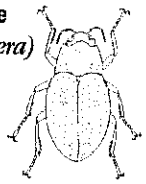


Mayfly
(Order Ephemeroptera)
Size 5-30 mm

20a. Back of body with hard wing covers, a pair of thin sheetlike wings beneath.

ADULT BEETLES (Order Coleoptera)

Adult Beetle



Riffle Beetle
(Order Coleoptera)
Size 1-8 mm

20b. Back without hard wing covers.....**21**

21a. Body with exposed membranous wings or wing pads.....**22**

21b. Body without membranous wings or wing pads (larvae).....**24**

22a. Membranous wings present; held flat in an overlapping V-shape across back. Mouth in the form of a beak, folded ventrally.

WATER BUGS: Water Strider, Water Boatman, Giant Water Bug, Creeping Water Bug (Order Hemiptera)

Water Boatman

Giant Water Bug

Creeping Water Bug

(Order Hemiptera)
Size 1-65 mm

22b. Membranous wings absent, wing pads present, large eyes. Mouth parts formed into an extendable scoop that is held ventrally. (Order Odonata)..... **23**

23a. Long thin abdomen ends in three bladelike gills.

DAMSELFLY LARVAE

(Order Odonata, Suborder Zygoptera)

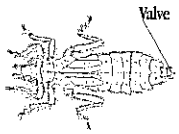
Damselfly
(Order Odonata)
Size 10-30 mm

23b. Robust, almond shaped abdomen with no obvious platelike gills; instead, has stiff pointed plates or valves.

DRAGONFLY LARVA

(Order Odonata, Suborder Anisoptera)

Dragonfly Larva
(Order Odonata)
Size 15-45 mm



24a. Caterpillar like appearance, distinct head, three pairs of short stubby thoracic legs.

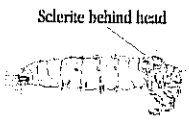
AQUATIC MOTH LARVAE (Order Lepidoptera)

Aquatic Moth Larvae
(Order Lepidoptera)
Size 20-25 mm

24b. Body otherwise..... **25**

25a. Fleshy, wormlike body with hardened head capsule and three pairs of legs near head. Hardened sclerite on at least the first segment behind the head. Often found in cases made of sticks, leaves and sand.

CADDISFLIES (Order Trichoptera)



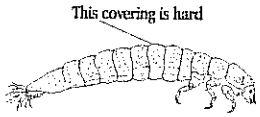
Caddisfly
(Order Trichoptera)
Size 2-40 mm

25b. Body covering mostly hard..... **26**

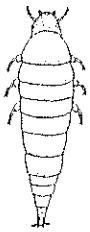
26a. Slender tapering filaments on the sides of each abdominal segment..... **27**

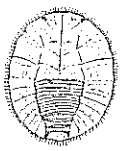
26b. No filaments on abdomen; body either entirely hardened or entirely soft with hardened head capsule or distinctly flattened with legs hidden underneath.

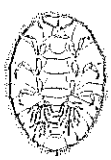
SOME BEETLE LARVAE: Riffle beetles, water pennies and others (Order Coleoptera, Family Elmidae; Family Psephenidae, and others)



Riffle Beetle Larvae
(Family Elmid)
Size 2-40 mm







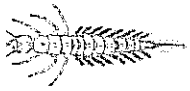
Water Penny **Water Penny**
(Family Psephenidae)
Size 4-6 mm

Beetle Larvae
(Order Coleoptera)

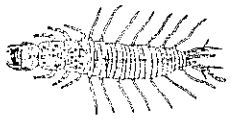
27a. Body ending in a pair of hook-bearing fleshy legs (Dobsonflies) or in a single tapering filament. (Alderflies)

DOBSONFLIES AND ALDERFLIES

(Order Megaloptera)



Alderfly
(Order Megaloptera, Family Sialidae)
Size 10-25 mm

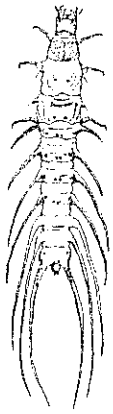


Dobsonfly or Hellgrammite
(Order Megaloptera, Family Corydalidae)
Size 25-90 mm

27b. Body ending otherwise.

SOME BEETLE LARVAE

(Order Coloeptera)



(Family Hydrophilidae)
Size 4-60 mm