

Wacky Key

Key to the families of common, summer invertebrates of the Waccamaw River, SC

- | | |
|--|----|
| 1a Has legs with joints | 2 |
| 1b Does not have legs with joints | 36 |
| 2a Six legs | 3 |
| 2b More than 6 legs | 32 |
| 3a Has no tail or 1 tail (may have 2 fleshy "legs" with claws on back end) (Figs. 1, 11) | 4 |
| 3b Has 2 or more tails (may be broken off - look for attachment points) (Fig. 2) | 6 |



Fig. 1 No tail or 1 tail



Fig. 2 Two or more tails

- | | |
|--|---|
| 4a Surface of abdomen soft and fleshy (Fig. 3) | 5 |
| 4b Surface of abdomen at least somewhat hardened (Figs. 6, 8, 9) | 8 |

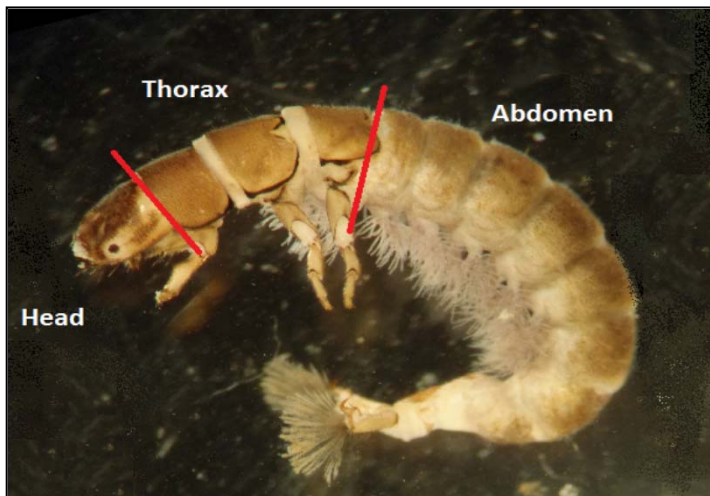


Fig. 3 Head, thorax, and abdomen

- | | |
|---|--|
| 5a No long filaments extend from sides of abdomen;
may have gills and/or a case (Fig. 3) | 11 |
| 5b A single long filament extends from each side of each abdominal segment (Figs. 4, 45) | 31 |
| 5c Each segment with several filaments on top of abdomen,
each at least 1/2 as long as body (Fig. 5) | Coleoptera, Haliplidae , <i>Peltodytes</i>
(beetle larvae) |



Fig. 4 Single filaments at side (Corydalidae)



Fig. 5 Several long filaments on top (Halipidae *Peltodytes*)

- | | |
|---|--|
| 6a Gills down each side of the abdomen or on top of it
most with 3 hair-like tails (Figs. 19, 20, 30, 42, 54) | 22 |
| 6b No gills down sides of abdomen (may have gills beneath) (Figs. 36, 65) | 7 |
| 7a Three flattened tails (Figs. 33, 36) | Odonata, Zygoptera 15
(damselflies) |
| 7b Two hair-like tails (Figs. 61, 65) | 21 |
| 8a A very hard shell covers abdomen and delicate inner wings
(like a beetle); mouthparts <u>never</u> forming a tubular or triangular
beak (often pointing backward beneath head) (Figs. 6, 40, 41, 45, 46, 51) | Coleoptera 26
(beetle adults) |
| 8b Not as above; mouthparts may or may not form a tubular
or triangular beak (Figs. 7, 31, 44) | 9 |



Fig. 6 Very hard shell covering wings



Fig. 7 Mouthparts forming a tubular or triangular beak

9a Mouthparts forming a tubular or triangular beak (often pointing backward beneath head); often with overlapping leathery wings covering delicate inner wings (Figs. 7, 8, 61, 62)

Heteroptera, 25
(true bugs)

9b Mouthparts not forming a tubular or triangular beak

10



Fig. 8 Overlapping leathery wings (Belastomatidae)



Fig. 9 Hard elongate body, small eyes, trapdoor (Elmidae)

10a A single filament extends from the side of each abdominal segment; may or may not have thick tufts of gills beneath abdomen (Figs. 4, 39)

Corydalidae
(hellgramites)

10b Broad abdomen and big prominent eyes (Figs. 27, 38, 44, 56, 59)

Odonata, Anisoptera 17
(dragonflies)

10c Hard elongate body and small eyes; trapdoor containing gills beneath last segment (Figs. 9, 41)

Coleoptera, **Elmidae**
(riffle beetle larvae)

11a Case maker; two short fleshy "legs" on last segment each with a claw; three humps (on each side and one on top) on first segment of abdomen, look on first segment behind those with legs, humps sometimes become a bit flattened (Figs. 10,11)

Trichoptera 13
(caddisflies)

11b Not a case maker; two fleshy "legs" on last segment each with a claw; no humps (Fig. 11)

Trichoptera 12
(caddisflies)

11c No fleshy "legs" on last segment; no case; no humps (Fig. 51)

Coleoptera, **Hydrophilidae**
(water scavenger beetle larvae)

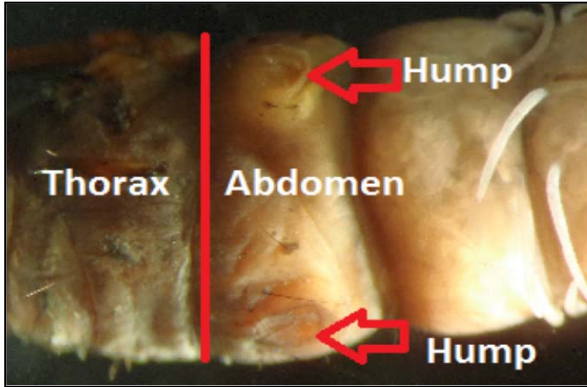


Fig. 10 Humps on first segment of abdomen (Limnephilidae)



Fig. 11 Two fleshy "legs" on last segment

12a Thick tufts of gills beneath abdomen (Fig. 3)

12b No gills beneath abdomen (Fig. 68)

Hydropsychidae
(net-spinning caddisflies)
Polycentropodidae

13a Case broad and flat, made of sand (Fig. 60)

13b Case not as above

Molannidae
14

14a Antennae much longer than wide (Fig. 12)

14b Antennae just tiny bumps (between eye and front edge of head) (Fig. 13)

Leptoceridae
(longhorn caddisflies)
Limnephilidae



Fig. 12 Antenna much longer than wide (Leptoceridae)



Fig. 13 Antenna just a tiny bump (Limnephilidae)

15a First segment of antenna long, half as long as entire antenna (Fig. 33)

15b First segment of antenna short (Fig. 36)

Calopterygidae
(broad-winged damselflies)
16

16a Prementum (underside of head) long and narrow, shaped like a spoon including the handle (Fig. 55)

16b Prementum short and wide, somewhat triangular (Fig. 36)

17a Prementum (underside of head) flat (Fig. 14)

17b Prementum cup shaped (Fig. 15)

Lestidae
(spread-winged damselflies)

Coenagrionidae
(narrow-winged damselflies)

18

19



Fig. 14 Prementum flat (Gomphidae)



Fig. 15 Prementum cup shaped (Corduliidae)

18a Antenna has 4 or fewer short chunky segments (Figs. 14, 44)

18b Antenna longer with 6 or more slender segments (Fig. 27)

19a Head with stout triangular horn pointing up between antennae; legs long and spider-like, first segment of hind leg reaching near back end of body (Fig. 16, 59)

19b No upward-pointing central horn, legs shorter (sometimes has forward-pointing horn) (Fig. 17)

Gomphidae
(clubtail dragonflies)

Aeshnidae
(darners)

Macromiidae

20

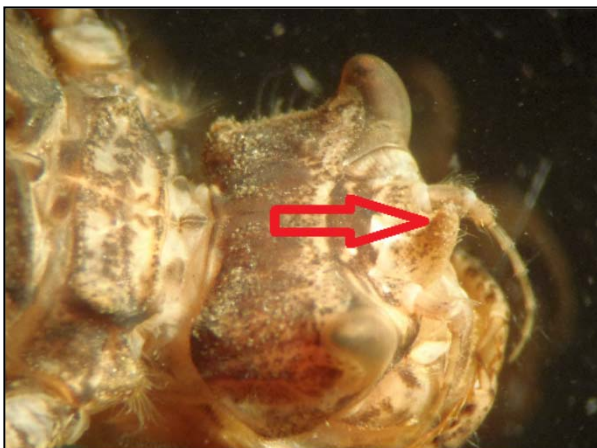


Fig. 16 Triangular horn pointing up (Macromiidae)



Fig. 17 Forward-pointing horn (some Corduliidae)

20a Narrow end of prementum (underside of head) with central groove on bottom (Figs. 18, 38)

20b Narrow end of prementum without central groove on bottom (Fig. 56)

Corduliidae
(emerald dragonflies)
Libellulidae



Fig. 18 Prementum with central groove (Corduliidae)

21a No visible gills; body stick-like (Fig. 61)

Heteroptera, **Nepidae**, *Ranatra*
(water scorpion)

21b No visible gills; large head with cluster of dark spots making up each eye (Fig. 40)

Coleoptera, **Dytiscidae**, *Neoporus*

21c Tufts of branched gills where legs attach but none on abdomen (Fig. 65)

Perlidae
(stoneflies)

21d Gills otherwise

other Plecoptera
(stoneflies)

22a Operculate gills present (operculate gills cover other gills) (Figs. 19, 20)

23

22b No operculate gills

24



Fig. 19 Triangular operculate gills (Leptohiphidae *Tricorythodes*)



Fig. 20 Squarish operculate gills (Caenidae *Caenis*)

23a Operculate gills triangular (Figs. 19, 53)

Leptohiphidae, *Tricorythodes*

23b Operculate gills squareish (Fig. 20, 32)

Caenidae, *Caenis*

- | | |
|--|--|
| 24a Broad flat head; gills along sides of abdomen (Fig. 47) | Ephemeroptera, Heptageniidae
(flathead mayflies) |
| 24b Feathery, forked, fringed gills on abdomen; with tusks (Fig. 42) | Ephemeroptera, Ephemeridae
(burrowing mayflies) |
| 24c Tiny body; oval gills along sides of abdomen;
notch in front of head (Figs. 21, 30) | Ephemeroptera, Baetidae
(minnow mayflies) |
| 24d Long gills on abdomen end in narrow points or filaments; no tusks (Fig. 54) | 30 |



Fig. 21 Notch in front of head (Baetidae)

- | | |
|---|--|
| 25a Large flat bug with stout front legs (Figs. 8, 31) | Belostomatidae
(giant water bugs) |
| 25b Long, fringed back legs like oars; body somewhat cylindrical (Fig. 62) | Notonectidae
(backswimmers) |
| 25c Body stick-like (Fig. 61) | Heteroptera, Nepidae , <i>Ranatra</i>
(water scorpion) |
| 26a Body smooth and streamlined;
usually some legs hidden when viewed from above (Figs. 40, 45, 51) | 27 |
| 26b Body less streamlined; long crawling legs, all usually visible from above;
antennae slender like thread (Figs. 41, 46) | 29 |
| 27a Eyes divided so that one pair look up and one pair look down (Fig. 45) | Gyrinidae
(whirligig beetle adults) |
| 27b Only one pair of eyes | 28 |
| 28a Antennae with last 3 segments widened and fuzzy,
often curls down below eye (beware that 3-4 segmented maxillary
palps may be longer than antennae (Figs. 22, 51) | Hydrophilidae
(water scavenger beetles) |
| 28b Antennae (and palps) slender (Fig. 40) | Dytiscidae
(predacious diving beetles) |

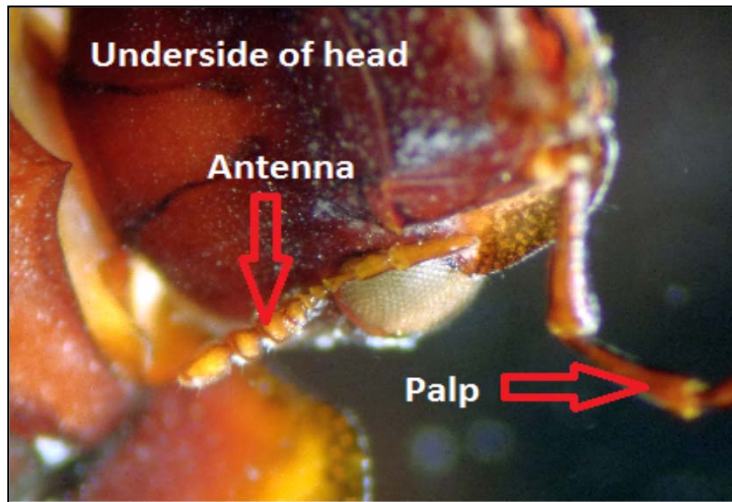


Fig. 22 Last 3 antenna segments widened and fuzzy

- | | | |
|-----|---|--|
| 29a | Two big flat plates cover the bases of hind legs and most abdominal segments (Fig. 46) | Haliplidae , <i>Peltodytes</i> |
| 29b | No big flat plates beneath abdomen (Fig. 41) | Elmidae
(adult riffle beetles) |
| 30a | 3 hair-like tails (Fig. 54) | Ephemeroptera, Leptophlebiidae |
| 30b | 2 small feathery tails (Fig. 2, second part) | Coleoptera, Dytiscidae , <i>Coptotomus</i> |
| 30c | 4 small feathery tails (gills) surround a single projection bearing 4 hooks; body usually white (Fig. 45) | Coleoptera, Gyrinidae |
| 31a | Dark in color (Figs. 4, 39) | Corydalidae
(hellgramites) |
| 31b | Creamy white (Fig. 45) | Coleoptera, Gyrinidae |
| 32a | Tiny body (<1/8 in.) spherical to egg-shaped, sometimes flattened; 8 legs (Fig. 50) | Acariformes, Hydracarina
(water mites) |
| 32b | Body flattened horizontally; often with tan or pink color pattern (Fig. 29) | Isopoda, Asellidae
(sowbugs) |
| 32c | Body not tiny and not flattened | 33 |
| 33a | Body shape like shrimp or crayfish (Figs. 34, 64) | Decapoda 34 |
| 33b | Body higher than wide; usually white (Figs. 43, 49) | Amphipoda, 35
(scuds) |
| 34a | Head projection (above eyes) flattened vertically; body usually white or translucent (Fig. 64) | Palaemonidae , <i>Palaemonetes paludosus</i>
(freshwater shrimp) |
| 34b | Head projection (above eyes) flattened horizontally (Fig. 34) | Cambaridae
(crayfish) |

- 35a First (top) antenna with a tiny branch at tip of second segment (Figs. 23, 43)
- 35b No tiny branch on first antenna (Fig. 49)

Gammaridae
Hyalellidae, *Hyalella*

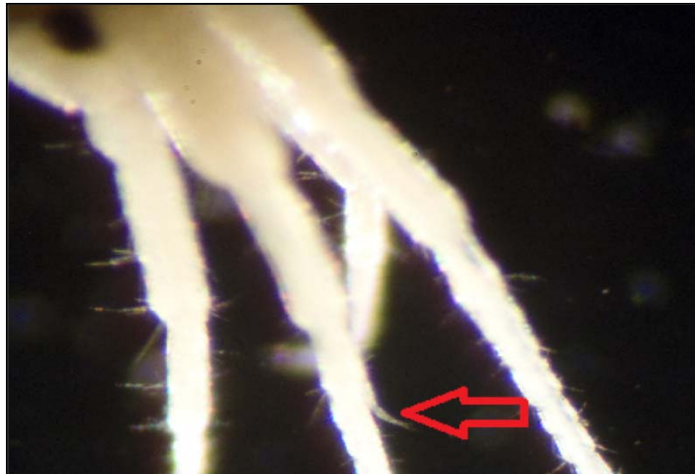


Fig. 23 Antenna with tiny branch (Gammaridae)

- 36a With one-part shell (Figs. 28, 66, 67, 73)
- 36b With two-part shell (like a clam) (Figs. 37, 70, 72)
- 36c Without shell
- 37a Shell opening on left when facing you with point up (Fig. 66)
- 37b Shell opening on right when facing you with point up (Fig. 73)
- 37c Shell spirals within the same plane forming no elevated point (Fig. 67)
- 37d Shell shaped like a low cone; no spiral (Fig. 28)

Gastropoda 37
 (snails)
 Bivalvia 38
 (clams/mussels)
 40

Physidae
 (lunged snails)
Viviparidae
 (gilled snails)
Planorbidae
 (rams-horn snails)
Ancylidae
 (limpets)

38a Short thick teeth inside each shell (at point of shell) surrounded on both sides by long narrow teeth (short teeth are somewhat perpendicular to shell edge while long ones run parallel to it); shell <2 in. wide (Figs. 25, 26)

39

38b Short thick teeth inside each shell (at point of shell) adjacent to only one set of long narrow teeth, or no teeth present (Figs. 24,72)

Unionidae
(mussels)

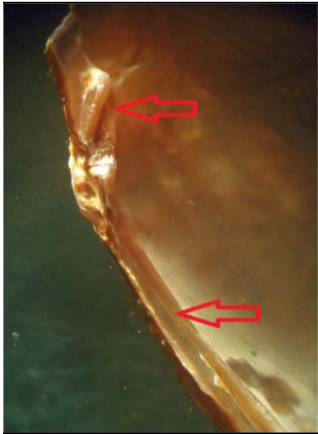


Fig. 24 Unionidae

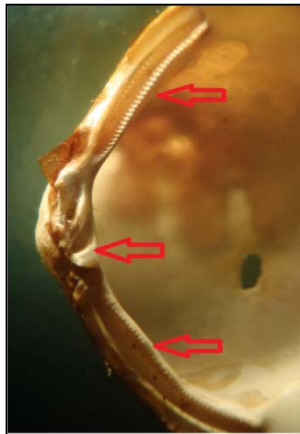


Fig. 25 Corbiculidae



Fig. 26 Sphaeriidae

39a Long narrow teeth serrated (Figs. 25, 37)

Corbiculidae, *Corbicula fluminea*
(asian clam)

39b Long narrow teeth not serrated; shell very small, most < 1/2 in. (Figs. 26, 70)

Sphaeriidae
(fingernail clam)

40a Head clearly visible; body seldom over 1/4 inch long (Figs. 35, 69)

41

40b No head or head withdrawn from sight (Figs. 48, 63, 71)

42

41a Tiny slender "C" shaped body; 1 pair fleshy "legs" near head;
No fan-like brushes near mouth (Fig. 35)

Chironimidae
(midge flies)

41b Obvious fan-like brushes near mouth; abdomen bulb-shaped (Fig. 69)

Simuliidae
(blackflies)

42a Head withdrawn into body; finger-like projections at back end (Fig. 71)

Tipulidae
(crane flies)

42b Body with many segments like an earthworm; no
finger-like projections (Figs. 48, 63)

43

43a Has two suckers on underside, one at each end; body often flattened (Fig. 48)

Hirudinea
(leaches)

43b No suckers; usually not flattened; wide range of sizes (Fig. 63)

Oligochaeta
(worms)

Representatives of each family listed alphabetically



Fig. 27 Aeshnidae



Fig. 28 Ancylidae



Fig. 29 Asellidae



Fig. 30 Baetidae



Fig. 31 Belostomatidae



Fig. 32 Caenidae



Fig. 33 Calopterigidae



Fig. 34 Cambaridae



Fig. 35 Chironomidae



Fig. 36 Coenagrionidae



Fig. 37 Corbiculidae



Fig. 38 Corduliidae



Fig. 39 Corydalidae



Fig. 40 Dytiscidae



Fig. 41 Elmidae



Fig. 42 Ephemeridae



Fig. 43 Gammaridae



Fig. 44 Gomphidae



Fig. 45 Gyrinidae



Fig. 46 Haliplidae



Fig. 47 Heptageniidae



Fig. 48 Hirudinidae



Fig. 49 Hyalellidae



Fig. 50 Hydracarina



Fig. 51 Hydrophilidae



Fig. 52 Hydropsychidae



Fig. 53 Leptohiphidae



Fig. 54 Leptophlebiidae



Fig. 55 Lestidae



Fig. 56 Libellulidae



Fig. 57 Limnephilidae



Fig. 58 Leptoceridae



Fig. 59 Macromiidae



Fig. 60 Molannidae



Fig. 61 Nepidae



Fig. 62 Notonectidae



Fig. 63 Oligochata



Fig. 64 Palaemonetidae



Fig. 65 Perlidae



Fig. 66 Physidae



Fig. 67 Planorbidae



Fig. 68 Polycentripodidae



Fig. 69 Simuliidae



Fig. 70 Sphaeriidae



Fig. 71 Tipulidae



Fig. 72 Unionidae



Fig. 73 Viviparidae

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