

# Notes on The Ecology of Certain Aquatic Invertebrates

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In the past few years the public has become more aware of the vast number of streams throughout these United States that are becoming polluted. Many of the potential water pollutants are synthetic organic chemical wastes being emptied into our rivers from huge manufacturing processes. Chemical identity of these waste products in the stream is almost impossible to trace with our present analytical techniques. However, clean streams of all sizes contain a diverse aquatic community of macroinvertebrates. These animals are exposed to the changes a river undergoes when a pollutant is introduced into the water; varying degrees of pollution are often reflected by the absence of certain of these organisms.

Mr. William M. Beck, Jr. recently assembled an artificial collection of organisms for demonstration purposes. These organisms were collected from a variety of streams in the state of Florida. The purpose of this material was to demonstrate the use of indicator organisms in determining water quality. Once assembled the collection presented a challenge. If this had been a true sample what could it tell us about the waters from which it was taken?

Listed below are 48 animals in the Florida Collection:

## List of Species

### Porifera

- Spongillinae (sponges)  
*Spongilla sp.*..... (1)

### Annelida

- Oligochaeta (aquatic earthworms)  
*Limnodrilus sp.*..... (2)  
Hirudinea (leeches)  
*Helobdella stagnalis* (Linn.) (3)

### Arthropoda

#### Crustacea

- Cladocera (water fleas)  
*Daphnia longispina* (O.F.M.) (4)  
Mysidacea (opossum shrimp)  
*Taphromysis louisianae* (Banner)  
..... (5)  
Isopoda (aquatic sowbugs)  
*Asellus sp.*..... (6)  
Amphipoda (scuds, sideswimmers)  
*Hyalella azteca* (Saussure). (7)  
Decapoda (shrimp, crayfish)  
*Palaemonetes paludosus* (Gibbes)  
..... (8)  
*Procambarus bivittatus* (Hobbs)  
..... (9)

#### Arachnoidea

- Hydracarina (water fleas)  
*Hydrachna sp.*..... (10)

#### Hexapoda or Insecta

- Collembola (springtails)  
*Isotomurus palustris* (Müller)  
..... (11)  
Plecoptera (stoneflies)  
*Neoperla clymene* (Newman) (12)  
*Perlesta placida* (Hagen).... (13)  
Ephemeroptera (mayflies)  
*Stenonema exiguum* (Traver)  
..... (14)  
*Isonychia sp. A* (Berner)... (15)  
*Ephemrella trilineata* (Berner)  
..... (16)  
*Hexagenia munda marilandica*  
(Traver) ..... (17)  
Odonata (dragonflies, damselflies)  
*Progomphus sp.*..... (18)  
*Gomphus pallidus* (Rambur) (19)  
*Perithemis seminole* (Calvert)  
..... (20)

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<i>Hagenius brevistylus</i> (Selys) (21)	
<i>Argia translata</i> (Hagen) . . . . (22)	
<i>Agrion maculatum</i> (Beauvois)	
. . . . . (23)	
Hemiptera (true bugs)	
<i>Ranatra</i> sp. . . . . (24)	
Megaloptera (alderflies, dobsonflies, fishflies)	
<i>Corydalis cornutus</i> (L) . . . . (25)	
Neuroptera (spongilla flies)	
<i>Climacia areolaris</i> (Hagen) . . (26)	
Trichoptera (caddis flies)	
<i>Chimarra socia</i> (Hagen) . . . . (27)	
<i>Polycentropus interruptus</i> (Banks)	
. . . . . (28)	
<i>Hydropsyche incommoda</i> (Hagen)	
. . . . . (29)	
<i>Cheumatopsyche</i> sp. . . . . (30)	
<i>Leptocella candida</i> (Hagen). (31)	
<i>Oecetis inconspicua</i> (Walker) (32)	
<i>Molanna</i> sp. . . . . (33)	
<i>Brachycentrus numerosus</i> (Say)	
. . . . . (34)	
Lepidoptera, Pyralididae (aquatic caterpillars)	
<i>Nymphula</i> sp. . . . . (35)	
Coleoptera (beetles)	
<i>Gyrinus</i> sp. . . . . (36)	
<i>Stenelmis lateralis</i> (Sands) . . (37)	
Diptera (flies, mosquitoes, midges)	
<i>Simulium</i> sp. . . . . (38)	
<i>Tabanus atratus</i> (Fabr.) . . . . (39)	
<i>Pentaneura monilis</i> (Linn.) . . (40)	
<i>Chironomus decorus</i> (Joh.) . . (41)	
<i>Cryptochironomus fulvus</i> (Joh.)	
. . . . . (42)	
<i>Corynoneura scutullata</i> (Win-	
mertz) . . . . . (43)	
<i>Tanytarsus exiguus</i> (Joh.) . . (44)	
<i>Culicoides</i> sp. . . . . (45)	
<b>Mollusca</b>	
Gastropoda	
Pulmonata (pulmonary snails)	
<i>Physa pumilia</i> (Say) . . . . . (46)	
Ctenobranchiata (gill snails)	
<i>Goniobasis floridensis</i> (Say). (47)	
<i>Campeloma</i> sp. . . . . (48)	

## Remarks

The hypothetical body of water represented is a shallow swift stream in north-

western Florida. The stream rises in the Citronelle formation and empties into the Gulf of Mexico. There are a number of springs emptying into the stream. There has been no organic pollution entering this portion of the stream within the past thirty months.

The stream may be described as follows: the water is low in color but may have a moderate turbidity; the dissolved oxygen is high throughout the year and the pH is between 7.0 and 8.2 Alkalinity is over 100 mg/l while hardness is over 110 mg/l due primarily to calcium and not to magnesium. In a cross-section of the stream at this point the velocity will range from 0 to over 3.5 fps. The stream has a great number of habitats at the point of collection. Sand with silt and mud bottoms occur. Some limestone is exposed in the bed of the stream. There are heavy growths of plants including *Nymphaea*, *Vallisneria* and probably *Naias*. There is a suggestion that a growth of *Panicum* is present. Hydric hammock occupies at least one bank with large trees overhanging the stream. The collection point is above any tidal influence but is not a great distance from salt water.

The collection was made on the lower southern slope of the Western Highlands near its junction with the Coastal Lowlands. The stream lies in northwestern Florida between the Chattahoochee and Escambia Rivers.

The springs mentioned above do not exist very far above the collection point and the plankton content of the water is low. The phosphate content of the upstream waters is low although a fairly high phosphate content may be found at the collection point. This collection was not made in the summer months.

Every point made in the above discussion may be supported directly by the individual species of animal in the collection.

Similar collections applicable to different parts of our country can be assembled without extreme difficulty. These collections are excellent teaching aids for the study of advanced biology and applied ecology.