Field Guide to Prawns of the Check Hall River

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By

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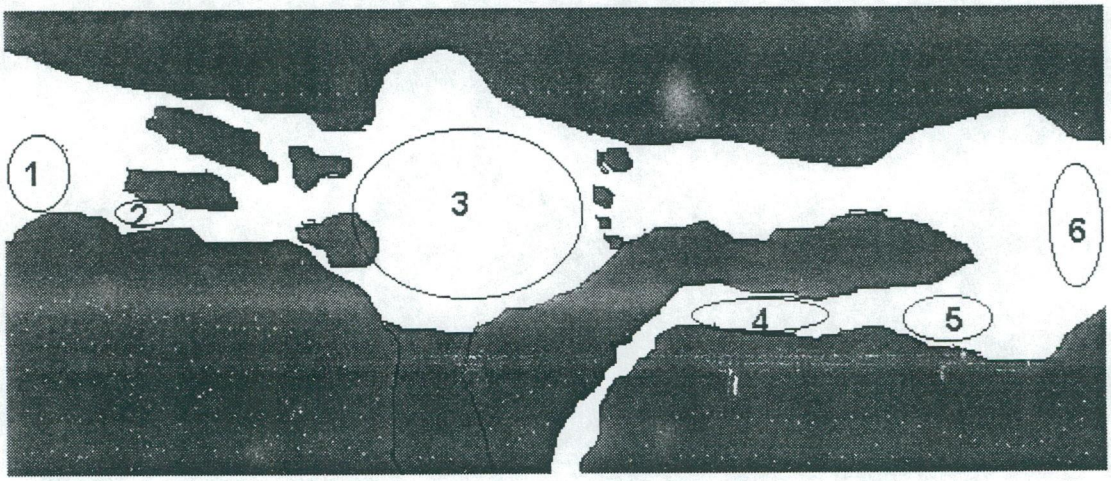
Introduction

This is a guide to the prawns of the Check Hall River. Prawns are defined as freshwater shrimp. Shrimp are differentiated from all other decapods by the fact that they have pinchers on their first and second pereiopods, with the second being the larger of the two. The Check Hall runs past the Archbold Research Center. Below is a diagram of the Check Hall River; numbered areas are sampling sites (see fig.1). This guide was designed to facilitate further research in this stream; therefore, a description of the most effective ways to catch, kill, and preserve specimens is included. This species guide contains scientific names along with pictures. There is a general description of each species that can be used to identify specimens in the field. A list of diagnostic characters that can be used to definitively identify species compliments the guide; the diagnosis is taken verbatim from the key. Finally, a description is included of the type of habitat in which each species is most likely to be found. The higher taxonomic groupings for prawns are listed below.

Kingdom: Animalia
Phylum: Arthropoda
Class: Crustacean
Order: Decapoda

Figure 1: Diagram of the Check Hall River



Methods of Capture

To be most effective at capturing prawns we found some general principals very useful. Use slow movement and try not to stir up any debris; it decreases visibility. Clear ziplock bags work best for transporting prawns. The time of day when you will be most successful is between two and five in the afternoon, and eight and ten in the evening. Work in groups of at least two people, and be patient and creative. We attempted four different methods of capturing specimens; netting, wire mesh trap, glass jar and light, and stick and grab. Only the glass jar and light, and stick and grab proved to be effective.

1. Netting

Equipment: thick gloves, net

Method: We attempted dropping the net on the prawn from above as well as scooping the net up from below the prawn. Both proved ineffectual because the prawns are very agile and quick.

2. Wire Mesh Trap

Equipment: wire mesh trap, bait (bread)

Method: Place the wire mesh trap in an area where many prawns are likely to be found, and place the bait in the back end of the trap. Prawns will be able to enter, but not exit this trap. This is the easiest method, but will only catch small specimens such as *Xiphocaris*. Using this method, you are unlikely to catch any large specimens.

3. Glass Jar and Light

Equipment: glass jar, underwater flashlight

Method: Use this method only at night. Hold the light and the jar in one hand and point the beam of the light up through the bottom of the jar. Point the light at the prawn, and persuade it into the jar using a stick. Then quickly close the lid on the jar. This method will not work with *Atya innocous*, because they shy away from light.

4. Stick and Grab

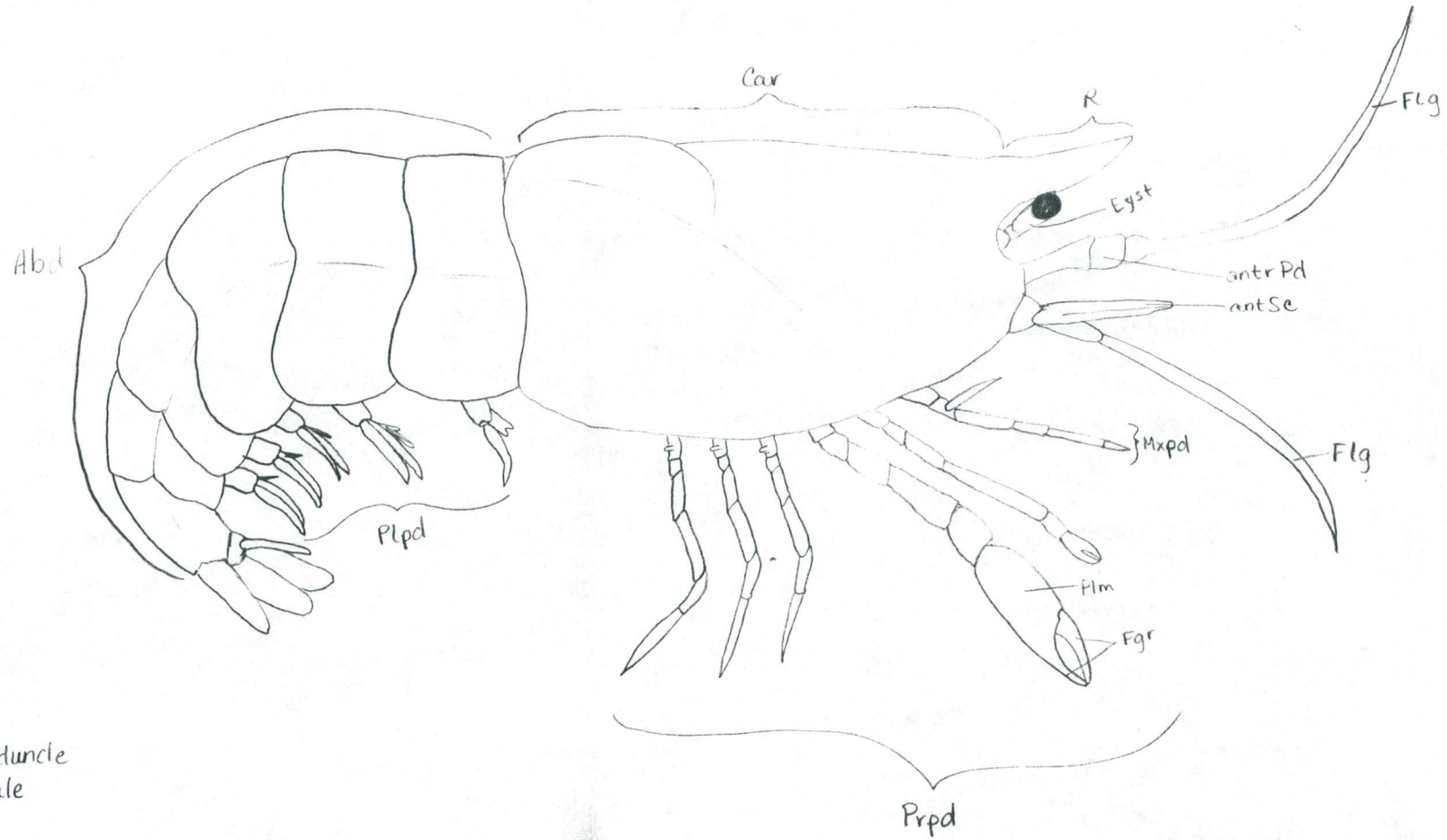
Equipment: thick gloves, underwater flashlight, stick

Method: Use the light to locate the specimen, and mimic the movement of free floating debris with the stick. Slowly move the stick into the prawn's general vicinity and pin it down. This can be done by pressing the stick on either one of the pinchers, or between the carapace and abdomen. Then quickly grab the prawn using the thick gloves. This is the best method for catching *Atya innocous* and other larger specimens.

Killing and Fixing Malacostraca (Crabs, Prawns, Lobsters, etc.)

1. Place specimen in a 10% neutral formalin solution for 24 hours.
2. Wash specimen with tap water.
3. Store in a 70% alcohol solution, this will preserve the specimen.

This method was taken from Biological Museum Methods: Volume 2, Plants, Invertebrates, and Techniques (Hangay and Dingley 1985).



Key

Abd, Abdomen
antPd, Antennal peduncle
antSe, Antennal scale
Car, Carapace
Eyst, Eyestalk
Fgr, Finger
Flg, Flagellum
Mxpd, Maxilliped
Plm, Palm
Plpd, Pleopod
Prpd, Pereiopod

Family Atyidae
Atya innocous

General Description:

1. Size = medium to moderately large
2. Coloration = camouflage (green and brown phases)
3. Eyes normal
4. Very short rostrum lacking dorsal teeth
5. Long tufts of hair covering pinchers on first two pairs of pereiopods
6. Only last three pairs of pereiopods visible when walking, because they tuck the first two pairs up under the body

Family Atyidae
Atya innocous

Diagnosis:

Orbital margin unarmed. Rostrum without dorsal teeth, lateral lobes obtuse, ventral margin virtually unarmed. Ventral margin of pleuron of second abdominal somite unarmed, those of third through fifth somites usually bearing rows of small, sharp denticles. Eyes not reduced. Basal segment of antennular peduncle without dorsal spines proximal to series bordering distal margin. Pereiopods without exopods. Fingers of chelae of first and second pereiopods bearing terminal tufts of long hair. Carpus of second pereiopod broader than long. Last three pereiopods bearing depressed horny scales. Merus of third pereiopod noticeably broader than that of fourth pereiopod, usually between 0.2 and 0.3 as broad as long. Appendix masculina on second pleopod of male broad lobe bordered with slender curved spines. Body without distinct dark-colored transverse bands near anterior and posterior ends of abdomen. A moderately large species, maximum postorbital carapace length at least 34 mm.

Habitat:

This species is most likely to be found in standing pools of still water with high levels of organic matter deposits. The area is usually shady, and they typically hide under the organic material found on the pool bottom.

Family Atyidae
Xiphocaris elongata

General Description:

1. Size = small
2. Coloration = mostly translucent
3. Eyes normal
4. Rostrum extremely long with dorsal teeth only at the base
5. No visible pinchers
6. No tufts of long hair on first or second pereiopods
7. Exopods on all pereiopods

Family Atyidae
Xiphocaris elongata

Diagnosis:

Orbital margin unarmed. Rostrum armed with series of subequal, close-set, small teeth in basal part of dorsal margin, ventral margin finely serrate. Ventral margins of abdominal pleura unarmed. Eyes well developed. Basal segment of antennular peduncle without dorsal spines. All pereiopods with well developed exopods. Fingers of chelae of first and second pereiopods without terminal tufts of long hair. Carpus of second pereiopod longer than broad. Last three pereiopods without horny scales or tubercles. Merus of third pereiopod not noticeably broader than that of fourth. Appendix masculina on second pleopod of male short (not overreaching appendix interna), subcylindrical, and armed distally with crown of moderately long spines. A medium sized species, maximum postorbital carapace length of about 15 mm.

Habitat:

These are found in all areas of the river; this is the most common species in the Check Hall River. They are attracted to light, thus are more frequently found in exposed areas. They are typically found swimming, as opposed to resting on a rock or the river bottom.

Family Palaemonidae
Subfamily Palaemoninae
Macrobrachium carcinus

General Description:

1. Size = medium to very large
2. Coloration = only species in Dominica with longitudinal stripes
3. Eyes normal
4. Rostrum with dorsal teeth
5. First and second pair of pereiopods with pinchers
6. Very small pinchers on first pair of pereiopods
7. Subequal claws on second pair of pereiopods
8. No long hairs on the dactyls
9. Dactyls may cross at tips, especially in large specimens

Family Palaemonidae
Subfamily Palaemoninae
Macrobrachium carcinus

Diagnosis:

Carapace with antennal and hepatic spines, without branchiostegal spine. Rostrum usually reaching to or slightly beyond end of antennular peduncle, dorsal margin sinuous, tip slightly upturned; armed with 11 to 16 rather regularly spaced dorsal and 3 or 4 ventral teeth; posterior 4 to 6 teeth of dorsal series placed on carapace behind level of orbital margin. Eyes large, cornea well pigmented. Second pereiopods of adult male subequal, robust; fingers slender, very slightly shorter than palm, gaping and proximal part, strongly crossing at tips, opposable margin of each arm near midlength (dactyl) and near end of proximal third (fixed finger) with large tooth, fixed finger partially pubescent; palm slightly compressed, more than three but less than four times as long as wide, armed with scattered spines, spines longer and less numerous near margin continuing onto fixed finger but not forming crestlike row; carpus about half as long as palm and slightly shorter than merus. Third pereiopod with propodus slightly more than twice as long as dactyl. Color pattern characterized by longitudinal dark and light stripes on carapace and abdomen. A very large species, maximum postorbital carapace length more than 90 mm.

Habitat:

This species is found in areas of running water, normally found resting in between rocks. They are extremely territorial; therefore you will not find them in close proximity to one another.

Family Palaemonidae
Subfamily Palaemoninae
Macrobrachium crenulatum

General Description:

1. Size = medium to very large
2. Coloration = variable
3. Eyes normal
4. Rostrum with dorsal teeth
5. First and second pair of pereiopods with pinchers
6. Very small pinchers on first pair of pereiopods
7. Second pair of pereiopods very well developed and subequal
8. Long hairs between dactyls of second pair of pereiopods
9. One large tooth on opposable margin of proximal end of dactyls of second pair of pereiopods

Family Palaemonidae
Subfamily Palaemoninae
Macrobrachium crenulatum

Diagnosis:

Carapace with antennal and hepatic spines, without branchiostegal spine. Rostrum reaching about as far as end of antennular peduncle, dorsal margin faintly convex, tip not upturned; armed with 11 to 14 rather regularly spaced dorsal and 3 or 4 ventral teeth; posterior 4 to 6 teeth of dorsal series placed on carapace behind level of orbital margin. Eyes large, cornea well pigmented. Second pereiopods of adult male very dissimilar and unequal; major cheliped with fingers slightly longer or shorter than palm, curved dactyl forming wide gape, one large tooth on proximal part of opposable margin of each finger, each finger densely covered with nonaligned spinules on both surfaces and bearing numerous tufts of long, stiff hairs along cutting edges; palm distinctly compressed, about twice as long as wide, armed with longitudinal rows of strong spines, those on mesial margin forming spiny crest diminishing rather abruptly at base of fixed finger but not near midlength of palm, spines of upper and mesial surfaces partially concealed by hairs; carpus shorter than either palm or merus but much more than half as long as palm. Third pereiopod with propodus two and one half to three times as long as dactyl. Color pattern usually characterized by light transverse patch on posterior part of third abdominal tergum; fingers on second pereiopod and second distal podomeres of third to fifth pereiopods not conspicuously banded; second pereiopods dark colored. A medium sized species, maximum postorbital carapace length about 30 mm.

Habitat:

This species is found in areas of running water, normally found resting in between rocks. They are extremely territorial; therefore you will not find them in close proximity to one another.

Family Palaemonidae
Subfamily Palaemoninae
Macrobrachium heterochirus

General Description:

1. Size = medium to very large
2. Coloration = striking transverse color bands on abdomen, usually either brown and yellow or blue and black
3. Eyes normal
4. Rostrum with dorsal teeth
5. First and second pair of pereiopods with pinchers
6. Very small pinchers on first pair of pereiopods
7. Second pair of pereiopods in adult males similar in form, but unequal in length
8. No hairs between dactyls of second pair of pereiopods
9. Fingers of second pereiopods touching throughout their length

Family Palaemonidae
Subfamily Palaemoninae
Macrobrachium heterochirus

Diagnosis:

Carapace with antennal and hepatic spines, without branchiostegal spine. Rostrum reaching anteriorly nearly or just as far as end of antennular peduncle, dorsal margin sinuous, tip slightly upturned; armed with 10 to 13 dorsal and 2 to 4 ventral teeth; posterior 4 to 6 teeth of dorsal series placed on carapace behind level of orbital margin, posterior 3 or 4 more erect and more widely spaced than others. Eyes large, cornea well pigmented. Second pereiopods of adult male similar in form but unequal in length; fingers about two thirds as long as palm, meeting throughout their length, without noticeably large teeth on opposable margins, each finger bearing numerous scattered spinules on exterior surface and short pubescent along cutting edge; palm only slightly compressed, three or more times as long as wide, provided with scattered spinules protruding from short pubescence, but without spiny crest along margin continuing from fixed finger; carpus about three-fourths as long as palm and as long as or longer than merus. Third pereiopod with propodus two to three times as long as dactyl. Color pattern characterized by dark transverse bands on abdominal tergites and dark boarders on pleura. A medium- sized species, maximum postorbital carapace length about 34 mm.

Habitat:

This species is found in areas of running water, normally found resting in between rocks. They are extremely territorial; therefore you will not find them in close proximity to one another.

Conclusion

The five species included in this guide are the most commonly found prawns in the Check Hall River. *Xiphocaris elongata* appears to be the most abundant species, while *Atya innocous* seems to be the rarest. All species in the genome *Macrobrachium* seem to be fairly equal in abundance. Project members observed one at least one other specimen, which is believed to not be included in this guide. Further sampling will likely yield more species. Future studies could focus on increasing the completeness of this field guide, or could focus on performing a detailed study on one of these species.

References:

Chase, Fenner A., Jr., and Horton H. Hobbs, Jr. 1969. *The Freshwater and Terrestrial Decapod Crustaceans of the West Indies with Special Reference to Dominica.* Smithsonian Institution Press, Washington, D.C. 475 pp.

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