

## Techniques Used for Catching Freshwater Shrimp in Puerto Rico

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### ABSTRACT

En Puerto Rico existe un pesca artesanal de *Macrobrachium* y *Atya*. Se utilizan para su captura una variedad de técnicas primitivas tales como usar las manos o usando un machete. Otros métodos más eficientes incluyen el uso de una vara bifurcada o "gigs" y arpones, que son utilizados en agua clara. La vara bifurcada es utilizada en áreas de aguas llanas y en noches sin luna, mientras que el arpón es usado por pescadores que bucean durante el día para capturar los camarones. Por lo general, las trampas poseen dos entradas para facilitar el sacar los organismos atrapados en la misma. Las carnadas utilizadas son variadas entre las cuales se encuentran el coco, maíz, pedazos de pescado, arenque ahumado y otras de origen casero que le han sido exitosas al pescador. Probablemente, el naso es el método más ampliamente utilizado pues puede usarse tanto de día como de noche, en aguas claras o turbias, en arroyos o áreas donde la corriente sea considerable. El naso se coloca en un punto fijo en la quebrada o arroyo, luego de lo cual, el pescador busca su presa moviendo con los pies o manos las piedras y asustando al camarón hasta que éste trata de escapar y la corriente lo lleva al naso quedando así atrapado. La atarraya es de dos a cinco metros de diámetro, con una malla de 13mm de tamaño y posee unas pequeñas pesas de plomo alrededor de todo el borde. Este tipo de red puede utilizarse en áreas que no son rocosas. El nasillo junto con la línea y el anzuelo son métodos que pueden utilizarse en cuerpos de agua con una profundidad entre tres y cinco metros. Al nasillo se le coloca una carnada y cierto peso para que llegue rápido al fondo y se asiente cuan largo es. Luego, se retira rápidamente del agua. El método por anzuelo y línea utiliza un pequeño anzuelo con revalvas al cual se le coloca una carnada y luego a una línea de monofilamento liviana. Al principio, la línea con el camarón que ha mordido el anzuelo se levanta lentamente, luego que está cercano a la superficie éste se hala rápidamente.

### INTRODUCTION

Puerto Rico has an artisanal, freshwater stream, shrimp fishery. Most of the shrimp caught are *Macrobrachium* and *Atya* species. Shrimp are caught both in the coastal and mountainous areas around the island and are generally consumed by the fishermen or sold along the roadside. A variety of techniques have been developed by the fishermen. These methods will be presented in the order of most primitive to most advanced.

#### By Hand

The most primitive method of catching river shrimp is by hand. It consists of trapping the shrimp, either between rocks or crevices or in small caves and

can be used in clear or turbid water which is generally shallow. This method is risky to the fisherman, who may be pinched or injured by the powerful chelae (pincers) of the shrimp or freshwater crabs. This method also requires skill, since some of the shrimps, for instance *Atya* species, have such a smooth exoskeleton that it is even difficult to hold a living specimen out of the water (Chace and Hobbs, 1969).

### **Machete**

This inefficient, primitive method is used on moonless nights in clear water streams. A bright light is used to search in shallow waters, where the machete is slashed into the water to kill the shrimp. The shrimp are often cut into two parts, but other times escape only to die from an incurred wound. This method has fallen into disuse in recent years.

### **Forked Stick**

This somewhat more advanced version of the machete method uses a 2 meter long, slim, forked stick in clear streams on moonless nights. Bright lights are used to search for the shrimp that must be pinned against a uniform bottom where it can be caught alive. This method requires a skilled person with good aim and is not used much today.

### **Gig**

A gig is more efficient than the machete or forked stick and is used during moonless nights in clear water. A bright light is used to search for the shrimp in shallow water. A gig consists of a spear-like pole with three to seven prongs protruding from the end of the pole. Once the shrimp is speared, it is held against the bottom until the shrimp is trapped with a free hand.

### **Spear**

The fisherman usually uses a diving mask to hunt for the shrimp in clear water during the day. He dives and when he detects a shrimp, thrusts his spear or gig at the prey.

### **Traps**

Traps and nets of various forms and materials are used. Traps have one or two openings which are designed to make exiting difficult and are similar to traps used in Asia (Taw, 1982). A variety of baits are used, including coconuts, corn, cut fish, smoked herring, or homemade baits with which the fisherman has had previous success. The traps are baited and sit for one or several days before they are checked. These traps have the advantage of allowing the fisherman to collect live specimens which can be sorted for larger shrimp. Small shrimp and berried females can be thrown back into the stream. However, traps are subject to vandalism.

### **Basket Net**

This is probably the most common method of catching shrimp in rivers. This method can be used during the day or night, in clear, or turbid water of small streams and in areas with a current. Larger nets are used on larger rivers

in areas with depths less than 1 m. Size and shape vary according to where the net is used. Generally, it consists of a hoop net supported by a rigid rod. It is held at a fixed point in the stream while the fisherman works his way downstream moving rocks with his feet or hands to scare the shrimp. Shrimp try to escape downstream and are caught and held by the current in the deep net. The fisherman then turns the net inside out on the stream bank to separate shrimp from debris.

### Cast Nets

The use of cast nets is popular in Puerto Rico due to this nets versatility. This method works best in shallow, turbid waters at night, but is also successful in clear water during the daytime. This method is not effective in extremely rocky places or in depths greater than 3 meters. The cast net is circular, about 60 to 100 cm in diameter, with 1.25 cm mesh and is equipped with lead weights fastened around the margin of the net. The net is constructed so that the circumference of the open end of the mesh cone is greater than the circumference of the leadline. As the net is retrieved the extra mesh forms a pocket that traps the shrimp (Nielsen *et al.*, 1983). One type has the edges turned inward to form a cup shaped ring which traps the shrimp as the net is dragged or lifted slowly. A string is attached to the center of the net, but there is no drawstring. Another type has a drawstring which pulls the margins of the net inward allowing the fisherman to "close" the net to form a purse-like pouch.

These nets are used in various ways. One method is to wait until just after sundown to bait areas of the stream having little or no current. Pelleted fish feeds or similar sinking foods, such as coconut meat attached to weighted coconut husks, are often used. The fisherman waits for about 20 minutes, then casts the net into the baited area to trap the shrimp attracted to the food. Another method can be employed by dragging the common castnet downstream. Often the downstream area is baited first.

### Cone Nets

Cone nets work well in muddy or clear water and can be used effectively in deeper places in the stream in depths up to 3—5 m deep where other fishing methods are difficult. Baits such as coconut meat, corn, flour, cod, etc., are placed in the bottom of the cone as attractants. The bottom of the net is weighted to drop the net quickly to the stream bottom. When the baited net is lowered to the bottom of the stream, the net will more or less flatten out on the stream bottom. The fisherman will wait for about 20 minutes, then rapidly pull the net toward the surface. The net elongates into the cone shape, thereby trapping the shrimp which swim toward the bottom of the cone.

### Hook and Line

The hook and line method can be utilized in turbid or clear waters and permits the fisherman to "fish" waters that are too deep for most methods. It consists of using a small, slightly opened barbed hooks (size number 11) or bent pins attached to the end of a light monofilament line. When the shrimp tries to swallow the baited hook, the line is pulled smoothly, then rapidly as the shrimp is brought from the water. Poles are often used if the pool is not deep. This method requires skill with using the hook and line.

An advanced variation on the hook and line method, used in Dominica, was described by Chace and Hobbs (1969). The equipment is prepared by using a six-foot line with a bent pin on one end of the line. The barb on a fish hook supposedly keeps the shrimp from accepting the hook, although the authors have found that barbed hooks work better on larger shrimp. The other end of the line is tied to one end of a pole about 1 m long. The hooked end should be baited with either small pieces of shrimp or an earthworm and the point of the hooked pin should be lightly stuck into the same end of the pole to which the line is tied. The opposite end of the pole should be grasped in one hand with the index finger flexed around the now U-shaped slack line approximately midway between its two ends. With the hook lightly anchored in the end of the pole, the baited end of the pole can be carefully directed into a crevice or gently thrust beneath a rock even in the swifter currents. If the shrimp accepts the bait, detectable by a gently tug on the index finger flexed around the line, the finger should be extended, thus releasing the line. The pole is slowly withdrawn until the slack has been taken from the line and within one and one-half minutes, should be drawn firmly but gently from the cavity under the rock. If the shrimp has swallowed the pin, it can be pulled from its lair and placed into a container or on the ground, where the hook can be removed.

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