Efficiency of Different Traps and Baits for Catching Freshwater Prawn *Macrobrachium* Spp. for Broodstock Development

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Abstract. Catching of wild freshwater prawns in Palawan is done by using different fishing gears, including baited traps. However, there are only limited studies related to the efficiency of these traps on catching freshwater prawns. In this study, the efficiency of four different traps (traditional plastic traps, bamboo traps, modified traps, and rattan traps) and three baits (low-valued fish, grilled coconut, and octopus) was tested in catching live *Macrobrachium* spp. from the rivers of two localities in the Barangay Bagong bayan, Roxas and Sitio Catama, Dumaran, Palawan at two sampling events with 12-hr intervals along the river bank. Each trap was deployed randomly 5-8 meters apart in the collection site late afternoon and retrieved the following day. The highest catch was obtained using plastic traps with low-value fish as bait. All samples from the different traps were collected alive. Modifications are underway to improve the design of these traps to improve catch efficiency. Regulating the collection of *Macrobrachium* from the wild by developing it into broodstocks will support the sustainable aquaculture industry using hatchery-produced seedstocks instead of sourcing it from the wild.

1. Introduction

*Macrobrachium* Spence Bate, 1868 (Crustacea: Palamonidae) is among the highly diverse, abundant and widespread group of decapod crustaceans [1]. This genus is comprised of 242 species and subspecies that inhabit fresh to brackish environments [2]. They are native and widely distributed species that inhabit major river systems of Southeast Asia and other continents except for Europe [3]. Worldwide, about 100 species of *Macrobrachium* spp. were reported that exist. In a recent survey in the Philippines, 12 species of freshwater prawn were found [4].

*Macrobrachium* are usually caught from the wild. Traditionally, the seed of freshwater prawns is collected with bamboo strip traps [5] while the juvenile and adults are caught using baited-traps. [6] noted that fishing gears used in the collection of *Macrobrachium* spp. in the Philippines are the following: spear gun, shrimp pot, scissors net, prawn pot, push net, cast net, barricades shrimp pot, and fish corrals. Stationary fishing gears such as traps or pots are usually baited with different foods or
luring materials to increase the efficiency of catching the target organism. Some baits used are root crops, maize, palms leaves and fruits, coconuts, and fish [7] [8].

In Palawan, freshwater prawn collectors use traditional traps made of plastic bottles and scoop net; and these are called “siyud”. To catch live freshwater prawn, plastic bottle traps are usually baited with coconuts. On the other hand, modified gear made of battery and stainless steel to electrify the freshwater prawn and spear guns are also used by other collectors, but these types of gears kill freshwater prawns upon catching. There are only a little information and no published studies conducted about the different traps and baits in collecting live freshwater prawn in the province. Live freshwater prawns are highly valued in the market; however, in Palawan, this industry is merely relying on wild stocks. There is an ongoing research project on broodstock development to establish freshwater prawn hatchery in the province. Several healthy and live individual adult freshwater prawns would be necessary for the study. Thus, this study was conducted to assess the efficiency of the different traps and baits, which are the traditional plastic traps, bamboo traps, modified traps, and rattan traps to catch live freshwater prawns.

2. Materials and Methods

2.1 Study Sites
The study was conducted in the rivers of Sitio Catama, Dumaran, Palawan and Barangay Bagong Bayan, Roxas, Palawan (Figure 1).

2.2 Baits used
Three different types of baits were used in the study, including low-valued fish, coconut and octopus. The low-value fish and octopus were placed on ice to maintain freshness. The coconut was grilled to release the aroma (Figure 2). The baits are wrapped in the nets before being placed in the traps.

2.3 Traps used
Four different traps were used in the study: bamboo trap or crab pot, rattan traps, modified traps and plastic traps (Figure 3).

2.4 Set-up of traps
Setting of traps was done at 4:00-6:00 PM. All traps were baited with low-value fish, coconut and octopus, and randomly set in the area at intervals of 5-8 meters. Hauling of traps was done after 12 hrs the following morning. All freshwater prawns caught in the traps were immediately placed in pails with freshwater (Figure 4).

2.5 Maintenance of catch: The freshwater prawn that was caught in each trap were counted and recorded. They were transported to the project site and then stocked in the hapa nets for monitoring. (Figure 5).

2.6 Data analysis
All statistical data was analyzed using One Way Analysis of Variance (ANOVA) to determine significant difference at P<0.05.

Figure 1. Map of Palawan showing the two (2) Sampling area, A. Catama, Dumaran, Palawan and B. Bagongbayan, Roxas, Palawan.
Figure 2. Different baits used; Low-valued fish, Coconut and octopus.

Figure 3. Different traps used, Bamboo traps (A), Rattan traps (B), Modified traps and Plastic traps (C).
3. Result and Discussion

The result of the study in Bagong Bayan, Roxas, Palawan showed that plastic traps with low-valued fish have the highest total catch with 229 pcs on day 1 and 154 pcs on day 2, and modified traps have the lowest with no catch during days 1 and day 2 (Figure 6). In terms of CPUE, plastic traps with low-valued fish have the highest catching efficiency with 19 pcs/hour on day 1 and 13 pcs/hour on day 2, while modified traps have the lowest catching efficiency with 0 pcs/hour during day 1 and day 2 (Figure 7). The same result was obtained in Catama, Dumaran, Palawan, wherein plastic traps with low-valued fish have the highest total catch of 52 pcs on day 1 and 40 pcs on day 2. Bamboo traps with octopus have the lowest catch on day 1 with a total catch of 2 pcs, and Bamboo traps with low-valued fish and Rattan traps with coconut have the lowest catch on day 2, both with a total catch of 6 pcs (Figure 8). Like CPUE, plastic traps with low-value fish have the highest catching efficiency with 4 pcs/hour on day 1 and 3 pcs/hour on day 2. All the remaining different traps have the same catching efficiency with 1 pcs/hour during days 1 and 2 (Figure 9). ANOVA (P<0.05) showed no significant differences between the different traps and baits in the two study sites.
**Figure 6.** Total catch of different traps in Bagongbayan, Roxas Palawan

**Figure 7.** Catch per Unit Effort of different traps in Bagongbayan, Roxas Palawan
**Total Catch**

![Graph showing total catch](image)

PT=Plastic Traps  
BT= Bamboo Traps  
MT=Modified Traps  
RT=Rattan Traps  
LVF=Low-Valued Fish  
C=Coconut  
O=Octopus

**Figure 8.** Total catch of different traps in Catama, Dumaran Palawan

**CPUE (pcs/time)**

![Graph showing CPUE](image)

PT=Plastic Traps  
BT= Bamboo Traps  
MT=Modified Traps  
RT=Rattan Traps  
LVF=Low-Valued Fish  
C=Coconut  
O=Octopus

**Figure 9.** Catch per Unit Effort of different traps in Catama, Dumaran Palawan
The present study focused on catching live freshwater prawn for broodstock development in Palawan using different traps and bait such as plastic traps, bamboo traps, modified traps, and rattan traps baited with low-valued fish, coconut, and octopus. The study revealed that plastic traps baited with low-valued fish were better in catching wild freshwater prawns in terms of the number of catches and CPUE.

Presently, there are only limited published studies on catching live Macrobrachium from the wild using different traps. The efficiency of the different traps to catch freshwater prawns was significantly affected by the baits used. [7] Used 24 traps (large, medium, and small) locally called matapi with the different baits such as babassu coconut and fish to catch M. amazonicum in Guajará bay. A total of 909 M. amazonicum with an average total maximum length of 13.65 cm was collected in their study. Using medium traps baited with babassu coconut was the most successful combination. Standard baits used in traps for Macrobrachium in commercial and artisanal fishing was also reviewed by [8], these are white core root of cassava, boiled maize shaft, yam stems and leaves, and palm frond, coconuts, and maize and palm fruits [9] [10] [11] [12] [13]. The shape of the trap also affects their efficiency of catching Macrobrachium sp. Minnow nets aided with lamps had a significant number of catches with a total of 25 individuals, as compared to box-shaped (7 individuals) and wire-stage trap (10 individuals). Still, both traps had more catch than bamboo stage traps over the six nights of sampling in Barito River [14]. Different traps were also designed to catch a particular size of the freshwater prawn. [15] Used woven cane traps in collecting adult and mosquito net traps for juvenile M. vollenhovenii in Ogun and Okumnany River. On the other hand, [5] used traps called Bagala or Bokshi to catch the wild seed of M. rosenbergii in the Amba River.

During the sampling days, the researchers could not conduct measurements of freshwater prawns' body length and weight to avoid possible high mortality upon transportation to the laboratory before the broodstock development. Most of the collected samples were small in size sensitive. The study conducted by [7] showed that babassu-medim matapi combination can catch M. amazonicum with carapace length (CL) ranging from 10-15mm and 15-20mm or class 2 class 3 individuals. The bodyweight of the catch ranged from <5 g and 5-10 g, respectively. In the informal interview conducted, the freshwater prawn gatherers in Palawan preferred using plastic traps to catch wild freshwater prawns because this trap is easy to use and handle. However, the use of this trap can catch only small sizes of the organism.

4. Conclusion
There was high catching efficiency of freshwater prawn using the different traps and baits. Low-value fish is the preferred bait for plastic traps. The type of bait in catching freshwater prawns depends on the traps to ensure higher catch volume.

5. Reference

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