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FOOD, FEEDING HABITS AND SEX RATIO IN THE AFRICAN RIVER PRAWN, MACROBRACHIUM VOLLENHOVENII (HERKLOTS, 1857) FROM OLOGE LAGOON, LAGOS, NIGERIA

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ABSTRACT

Using barrier traps (with non-return valves), 500 specimens of Macrobrachium vollenhovenii (Herklots, 1857), of size range 7.2cm-13.5cm total length, were collected from Ologe Lagoon, and examine for food and feeding habits and sex ratio. Analysis of the stomach contents was by the frequency of occurrence and numerical methods. The major food items were the algae, crustaceans and fishes. The algae accounted for 47.84% by number and 42.08% by occurrence, while the crustaceans accounted for 23.55% by number ad 54.26% by occurrence. The fishes made up 15.44% by number and 44.10% by occurrence. The females predominated over the males with a statistically significant sex ratio of 1 male to 3.03 females.

INTRODUCTION

Prawns are decapod crustaceans which serve as a source of animal protein, provide foreign exchange, and chitin, which is extracted from the shell of prawns, can be converted into chitosan which serves a variety of uses.

Prawns sourced from the wild, have for years, been the only means of meeting both local and foreign demands. However, evidence abounds that prawn catches from our coastal waters have reduced drastically due to over-exploitation and pollution. Consequently, local and foreign demands have exceeded the quantity obtained from natural waters, hence, the need to supplement prawn catch through aquaculture. One of the likely choices for aquaculture in Nigeria is the African river prawn, Macrobrachium vollenhovenii. Powell (1982) reported that this prawn is comparatively readily available in West Africa.

The biology of this prawn has been extensively studied. Such studies include Anetekhai (1986; 1989), Anetekhai and Bakare (1990), Anetehhai and Fagade (1989), Udo and Ekpe (1991), and Marioghae and Ayinla (1995). Despite its apparent importance and culture potentials, very little published material is available on the food and feeding habits of this species. Food and feeding habit studies are important in determining the quality and quantity of food that can be given to the prawn in a culture system. This paper, therefore, provides information on the food and feeding habits and sex ratio in the African river prawn, Macrobrachium vollenhovenii.

MATERIALS AND METHOD

Specimens of Macrobrachium vollenhovenii used for this study were caught with barrier traps (with non-return valve) from the Ologe Lagoon in Lagos State, Nigeria.

The total length of each specimen was measured on a measuring board, to the nearest tenth of a centimeter, while the body weight was determined to the nearest hundredth of a gram, with a top-loading Mettler balance (Model PE 1600). Each specimen was cut open from the ventral side (mouth region), using a dissecting scissors to remove the stomach. A cut was then made through the stomach to expose the contents of the stomach into a petri-dish. Water was added into the stomach contents in the petri-dish, and the contents viewed under the microscope for identification of the various food types and organisms. The contents of the stomach were

analysed by the frequency of occurrence and numerical methods as described by Hynes (1950).

The sexes were determined by the presence or absence of eggs on the abdominal region of the prawn, presence or absence of lump on the ventral side of the first abdominal segment (Anetekhai, 1990) and the microscopic examination of the pleopod of the second abdominal segment of the prawn.

RESULTS

Food and Feeding Habits

Of the 500 specimens of Macrobrachium vollenhovenii examined, 186 (37.2%) had empty stomachs. A summary of the stomach contents is presented in Table 1. The algae constituted the most important food item, and made up 47.84% by number and 42.08% by occurrence. Next in order of importance were the crustaceans which accounted for 23.55% by number and 54.26% by occurrence. Arthropods were also found in the stomach of M. vollenhovenii. By number, the arthropods accounted for 12.31% of all food items and 26.14% by occurrence.

Mollusca (broken shell) appeared to be less important as they accounted for only 0.87% by number and 3.49% by occurrence. Sand grains and unidentified items made up 72.38% and 43.31% respectively by the occurrence method.

Table 1: Summary of the Stomach Contents of *Macrobrahium vollenhovenii from Ologe Lagoon*

Food Item	Numerical Method		Frequency Of Occurrence	
		%	NUMBER	%
ALGAE				
Spirogyra	2344	26.02	39	12.32
Cladophora	1966	21.82	93	29.76
CRUSTACEA				
Ceriodaphnia	1218	13.52	124	39.53
Diaptomus	904	10.03	46	14.73
PISCES				
Fish eggs	872	9.68	79	25.14
Fish scales	519	5.76	60	18.96
ARTHROPODA				
Insect parts	1109	12.31	82	26.14
MOLLUSCA				
Broken shell	78	0.87	11	3.49
Sand grains	-	-	227	72.38
Unidentified items	-	-	136	43.31

Sex Ratio

Out of the 500 specimens examined, 124 (24.8%) were males, while 376 (75.2%) were females giving a sex ratio of 1 male to 3.03 females. The females thus predominated over the males accounting for more than half of the prawns examined. The chi-square analysis showed that there was a statistically significant difference between the expected 1:1 and the observed 1:3.03 sex ratio in *M.vollenhovenii* at 5% level of significance.

DISCUSSION

The major food items found in the stomach of *M. vollenhovenii* were algae, crustaceans and fishes. Other food items were insect parts, broken shell sand grains and unidentified items. This was an indication that the prawn was an omnivore. This fact was attested to by Marioghae and Ayinla (1970) who reported that the *Macrobachium* species in the Epe Lagoon fed on a variety of small benthic organisms. New and Singholka (1982) also reported that *M. rosenbergii* are omnivorous and their diet include aquatic insects and their larvae, algae, grains, nuts seeds, fruits, mollusks, crustaceans, fish flesh and offal of fish and other animals.

The sex ratio observed showed that the proportion of females was higher than the males. This was in agreement with the findings of Anetekhai (1990) who reported a mean monthly sex ratio of 1:3 in favour of the females for *M. vollenhovenii* from Asejire Lake. Sagua (1980) reported a sex ratio of one male to five females in *P. hastatus*. Anetekhai (1990) reported a breeding season of June to August in *M. vollenhovenii,* and since the prawn specimens used for this study were collected between April and June, which fell within the breeding, the higher sex ratio recorded in favour of the females could be due to the search for mating partners, on the part of the female, Anetekhai (1995) had reported that the males were territorial and that the female had to come into male's nest for mating and protection. Penn (1980) also reported a sex ratio in favour of males except during the breeding season when the females were favoured. The search for extra food required to replenish the body fraction used for egg production could also have accounted for the higher sex ratio recorded in favour of the females.

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