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Proximate Composition of Fresh Water Prawn Marobrachium Nipponenses and Crab Potamon sp. from al-Hawizah Marshes, South of Iraq

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Abstract
The seasonal changes were studied in the chemical composition in muscle of caridean prawn *Macrobrachium nipponenses* and crab *Potamon sp.* from al-Hawizah marshes– south Iraq for the period from June 2016 to May 2017. that was found to be varied among the two different size groups examined. The results showed that there were clear seasonal differences in the chemical composition of both crustaceans, with the highest rate of protein 20.02% in species *M. nipponenses* in the spring, while the highest rate of fat for the same species 3.52% in winter, while the highest rate For the second species of protein 19.28% in the spring, while the highest rate of fat ratio in this species 2.64% in the autumn, and showed the moisture and ash ratios of the two species mentioned clear seasonal differences.In general, the protein content in muscle male and female of two crustaceans was higher in small size groups than in large size groups. The protein content in two sexes and size groups of two species were high.
Keywords: *Macrobrachium nipponense,* proximate chemical, Protein, Fats, Carbohydrates.
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1.Introduction

Mesopotamia marshlands constitute the largest wetland ecosystem in the Middle East and western Eurasia. These marshlands are located at the confluence of Tigris and Euphrates rivers in southern Iraq. Al- Hawizah marsh is the biggest marsh in southern Iraq covered by an area (2400 Km ^{2}-3000 Km ^{2}) and depth (1.5 m-5 m).

The study of the chemical composition of prawns and crabs living in fresh water gives great importance to the nutritional value of each species. It also reflects the physiological state of the organism. There may be differences in composition between species by size, sex and nutrition. Protein content is important in the study of composition (Nargis, 2006)(1). And most developed countries see shrimp as a good alternative to food containing fat amino acids Perhaps the most important is characterized by shrimp is its rich content of amino acids and fatty unsaturated bonds and containing the enzymes of protein and lipid and mineral elements as well as lack of connective tissue (Zhao et al 2016; New et al., 2010)(2, 3).

Recent studies on the chemical composition of prawns and crabs in the Iraqi water bodies included the calculation of the amount of protein, fat and carbohydrates for males and females from various parts of the body, including the carapace area and scales and meat parts eaten, showed a difference seasonally between different size groups and between males and females in the proportion of protein.

Al-Khafaji et, al 2018a (4) included there studied, proximate composition (protein, carbohydrate, lipid, ash and moisture) and fatty acids in different size groups and sexes of blue crab *Portunus pelgicus.* In general, observed the protein content was higher in males than females and younger ones than in adults.

Al-Khafaji et, al 2018b(5) studies the nutritional status of three species of commercial shrimp *Penaeus semisulcatus, Metapenaeus affinis* & *Parapenaeopsis stylifera* in North West Arabian Gulf. The study concentrated on the nutritional status of the prawn in dry matter basis. The average values of the proteins, carbohydrates, lipids, ash and moisture as in fresh tissues of these shrimp species were recorded.

The present study aims at identifying the nutritional value of these two species of crustaceans taken from Iraqi fresh water bodies.

2. Materials and Methods

2.1. Sample collection

Shrimp samples were brought from al-Hawizah marshes- southern Iraq (Figure 1), for the period from June 2016 to May 2017 to the Laboratory of Life Technologies at the Center for Marine Sciences. The total length of the prawn *M. nipponenses* was divided into two groups. The first group consisted of small lengths (10-30 mm), while the second group was 30-95 mm long and included adults of the species. While, the total carapace length for crab *Potamon sp.* Was divided into two groups. The first group consisted of small lengths (10-30 mm), while the second group was 30-75 mm long and included adults of the species.

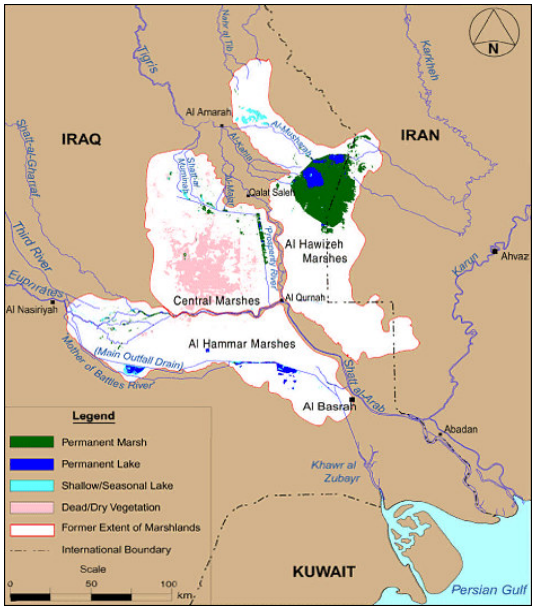

Figure 1: study area for collected two crustceans species in al-Hawizah marshes- southern Iraq.

2.2. Chemical analysis

Samples were analyzed to estimate the chemical components using the methods mentioned in A.O.A.C. (2000)(6).

Where the humidity was determined by drying the weight of the sample using the oven at 105 temperature until the stability of weight, the amount of protein was calculated by calculating the amount of nitrogen x 6.25 after micro-Kjedahle digestion of a given weight of samples using concentrated sulfuric acid and distillation with acid Boric and rectification with hydrochloric acid concentration 1N to determine the amount of nitrogen, and the method of extraction in the soxhlet for intermittent extraction to measure the lipid ratio using the cyclohexane solvent for 6 hours. The ash content after the sample was burned in the Muffel furnace at 525 °C for 14 hours until the weight was stable and the carbohydrate content of the samples was determined as difference from the total percentage (100%).

2.3. Statistical analysis

The statistical interpretation of the tabulated data was performed by using SPSS (18.0 version) for the mean standard deviation at 5% level of significance.

3. Results

3.1. Chemical composition of different length groups:

The chemical composition of the different length groups of the studied species was calculated to determine the differences in protein, fat and carbohydrate content between the length groups. The chemical analysis showed no significant differences ($p > 0.05$) in the chemical content between the different length groups. Figures 1 and 2 illustrate the chemical composition of different length groups of both species., and on this basis took a sample of all lengths for the purpose of chemical analysis.

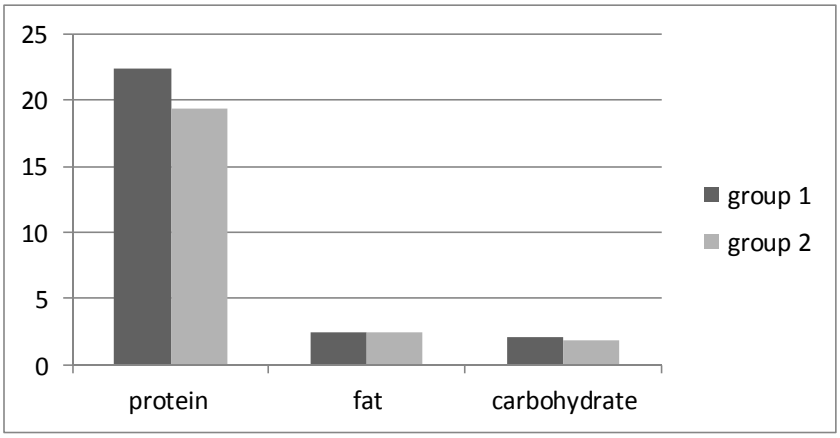

Figure 1: the chemical composition of two different length groups in *M. nipponenses*

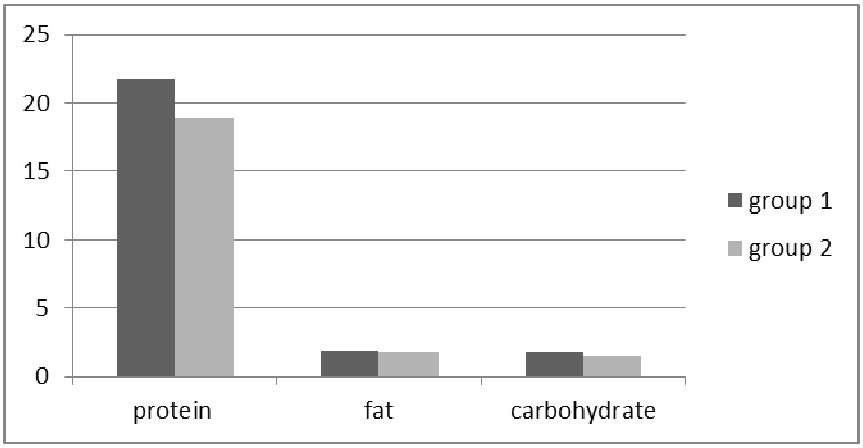

Figure 2: the chemical composition of two different length groups in *Potamon sp.*

3.2. Chemical composition of the two species during the four seasons:

The protein, fat, carbohydrate, ash and moisture content of the two species was calculated by taking a sample of tissues from this species over four seasons

1. freshwater prawn: The lowest protein level was 17.39% in the autumn, while the highest in the spring was 20.02%, the fat level was the lowest in the spring at 2.13%, while the highest in winter was 3.52%, the carbohydrates level lowest in winter was 1.61%, the highest in summer was 2.83% and the humidity was 70.84-73.16% During the four seasons, Table 1 shows the chemical composition of the freshwater prawn during the four seasons.

2. Fresh water cancer: The chemical composition of freshwater crab was calculated during the four seasons. The lowest percentage of protein was in the Autumn of 16.57%, while the highest in the spring was 19.28%, while the fat was the lowest in the winter season was 1.83% , And the highest percentage in the summer amounted to 2.64% and noted that the proportion of fat close in the four seasons. The lowest rate of carbohydrates in the spring was 1.92%, and the highest rate in winter was 2.47%. Humidity ranged between 70.91% and 74.21%. Table 2 shows the seasonal changes in the chemical composition of freshwater crab during the study period

Table 1: Mean proximate composition values of male and female of *M. nipponenese* (%) in four seasons.

Seasons	Moisture %	Protein %	Carbohydrate %	Fat%	Ash%
spring	71.15	20.02	2.16	2.13	4.27
summer	73.16	17.44	2.81	2.56	4.03
autumn	72.81	17.39	1.83	3.39	5.13
winter	70.84	18.51	1.61	3.52	5.52

Table 2. Mean proximate composition values of male and female of *M. nipponenese* prawn (%) in four seasons.

Seasons	Moisture %	Protein %	Carbohydrate %	Fat %	Ash%
spring	71.62	19.28	1.92	2.04	5.14
summer	72.27	17.15	2.04	2.64	5.90
autumn	70.91	16.57	2.27	2.47	6.78
winter	74.21	17.61	2.47	1.83	3.88

4. Discussion

The current study investigated the nutritional value of the freshwater prawn species *M. nipponenses* and freshwater crab *Potamon sp.* from the Hawizah marsh. It was found that the ratio of protein, fat and ash is close to these two species individuals in most seasons of the year. However, there are seasonally significant differences in some components of the chemical structure, It was observed that there were significant differences in humidity between autumn and other seasons, and there was no significant difference in fat and carbohydrate levels for this species. The reason for this is that the composition of shrimp muscles at different stages of sexual maturity of ether with sexual maturity of the neighborhood Which have effects on the ovaries and central gastrointestinal tract, and have been observed by Nisa and Sultana (2010)7. During the study of type F. penicillatus in Pakistan, and perhaps this conclusion is different from what Zative et.al (1969)8, in which the period of reproduction affects the chemical composition of muscles and other organs of the body,

Biochemical composition of organisms are known to vary with season, size of animal, stages of maturity and availability of food, temperature etc. Protein is the most prominent biochemical components of crustaceans from eggs to adult and is strikingly dominant in younger phases.

The high protein content in the lowest size groups may be attributed to increased protein synthesis during the active growth phase as it has been observed elsewhere in shrimps and mantis shrimps (Achuthan Kutty and Parulekar, 1984; Ajit kumar, 1990; Tanuja, 1996)9,10,11,. *M. nipponense* and *Potamon sp.* showed greater variation in protein with regard to size group, protein content was higher in younger organisms than in adults. In the present study two species also showed higher protein content in younger ones than in adults.

5. References

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