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Breeding of river shrimp *Macrobrachium nipponense* with *Barbus xanthopterus* in laboratory tanks

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Abstract

Juvenile river shrimp *Macrobrachium nipponense* were used with weights and bred with *Barbus xanthopterus* of the same weight for a 30-day experiment. The weight at the end of the experiment was 2.313 ± 0.567 gm and 11.167 ± 2.644 gm for both shrimp and fish respectively. The shrimp grew with a weight increase exceeding one gram, while the fish grew

with a weight increase exceeding 3 grams during the same period of the experiment. These results encourage the need to move towards mixed farming and benefit from the common factors between experimental animals to give more benefit from the sustainable crop.

Keywords: Breeding, Shrimp Nutrition, Shrimp Growth

Introduction

Shrimp in the aquatic environment are divided into two groups: the Caridae and the Panidae. There are more than eight types of shrimp in Iraqi waters (Al-Maliky, 2013) ^[2]. Shrimp culture with other species can be used in coastal areas with low salinity to reduce the problems prevalent in shrimp culture because species diversification can reduce the impact of waste streams and absorb most of the waste generated by shrimp monoculture, and shrimp polyculture can increase the productivity of aquatic species without disrupting the existing environmental conditions. Shrimp polyculture in low salinity is useful for controlling diseases caused by external trematodes and most external parasites and protozoa that cannot survive long in low salinity (Jewel *et al.* 2021) ^[5]. Mixed fish and shrimp farming was studied in Iraqi waters at the laboratory level, and the results were encouraging (Al-Maliky, 2017) ^[3].

Material and Methods

Selected sizes of shrimp *M. nipponense* with weights (0.81-0.85)gm and numbers (30), and fish *B. xanthopterus* with weights (7.7-7.9)gm and numbers (30). The experiment continued for 30 days and was fed with fodder. Environmental conditions and weights were measured every 10 days.

Results and discussion

The Fig 1 shows that the growth of fish *B. xanthopterus* was clear in its growth during the experiment period, as its weight increased by more than 3 grams. Likewise, the shrimp *M. nipponense* grew and its weight increased by more than one gram for the same experiment period. This relationship of mixed farming indicates the extent of the suitability of shrimp farming with fish through the nature of the shrimp's feeding on the fat and its benefit in purifying and cleaning the water of the farming ponds, thus helping to provide a more suitable and sustainable environment for aquaculture.

The environmental factors were suitable throughout the experiment, temperature between 24-28, pH between 7.8-8.1, and oxygen 6-8, These results are consistent with the results of studies by (Al-Maliky, *et al.* 2015; Al-Maliky, 2017) ^[4, 3].

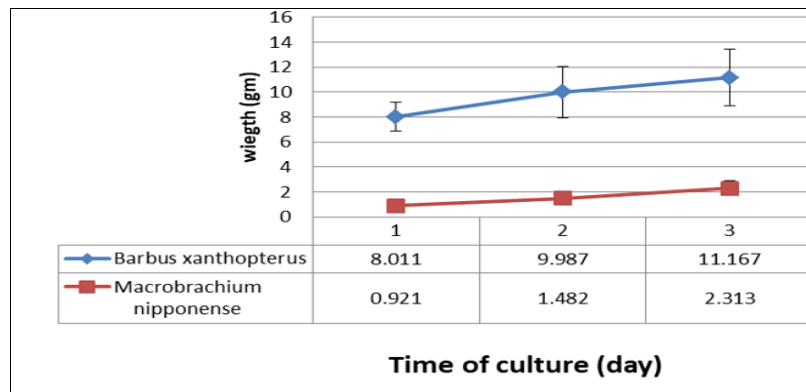


Fig 1: Growth of shrimp and fish during (1=10, 2=20 and 3=30 day) mixed culture.

When shrimp *M. nipponense* are raised with fish *B. xanthopterus* and given sufficient feed and nutrition, there is no aggression or assault between the two parties and they live together without aggression. This is what happened in the current study and was confirmed by Al-Daraji *et al.* (2019)^[1].

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