

Research Article

Fish feeding on mosquitoes in Murtizapur, District of Akola, Maharashtra State: length-weight relationship

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ABSTRACT

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After they establish themselves, these fish continue to kill mosquito larvae over an extended period of time. Comparatively speaking, the introduction of larvivorous fish is less expensive than chemical control. Using fish is a control strategy that is environmentally beneficial. Shallow water is preferred by larval fish like Poecilia and Gambusia, which are also the breeding grounds for mosquito larvae. The most common fish in the country for commercial purposes is the guppy. Both novices and professionals will find the guppy to be a great option. Children and novice fish keepers alike will do well with this lovely species. They can endure environments where other fish would die because they are so resilient. Additionally, the guppy is a great option for cycling brand-new aquariums. Cycling is the phrase used to describe the maturation phase of the aquarium. When an aquarium has enough beneficial microorganisms to reduce the toxicity of fish waste, it is considered mature. Guppy fish are aquatic, but they reproduce viviparously and undergo internal fertilization, which is more similar to vertebrate reproduction on land, which is why we chose them for our study.

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Introduction

Northern South America and the Antilles are home to the viviparous freshwater guppy, *Poecilia reticulata* Rodriguez (1997). In order to biologically manage mosquito larvae that transmit infectious illnesses like malaria, filaria, and chikun guniya, among others, it was put into Colombian waterways and the waters of numerous other tropical nations in the 1940s. Across all Maharashtra states, public health centres have employed it as one of the most effective and popular biological control agents against mosquito larvae. Poecilia's capacity for survival is attributed to the following traits: In the course of a day, a single fish consumes 80–100 mosquito larvae. It is a surface feeder that has an easier time navigating pond edges. It may devour its own offspring since it is a very carnivorous species.

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So that the young ones may hide and live, there has to be a decent number of weeds in the water. It is exceptionally well-suited to handling and transportation. It may be transported without the need for certain equipment. When placed in freshwater environments, it thrives and procreates. It may remain in the environment for many years when it has become well established. The learner has the chance to understand the variety of parts and how they work together to support a "typical" vertebrate's whole reproductive endeavour thanks to *poecilia reticulata*. This species is widely accessible and low maintenance, much as other Poeciliidae family members. Because of its unusual method of reproduction, the guppy exhibits a variety of reproductive traits in a single lab session, including gonad shape and courting behaviour. The Rojas group, 2004 *Poecilia reticulata* has been used as a biological model in several research, such as those on behaviour, the development of life histories, water quality, and Bronikowski et al. (2002). Since 1903, guppy fish have been extensively used in public health centres. Research has shown that regular partial water changes, stable ambient conditions, and a healthy food are essential to effective management. Water poisoning is the most prevalent cause of death for guppies. Guppies are poisoned by mineral-filled water, which kills them. The goal of the current research is to investigate the bacterial illnesses that affect guppy fish living in various environmental conditions in various parts of Murtizapur. The reason for the fish's demise will also be investigated. By boosting the guppies' fertility or survivorship, we may reduce the number of illnesses that mosquitoes transmit, such as filarial, malaria and chikungunya, among others.

Material and Methods

Several tanks at the P.H.C. (Public Health Centre) in Murtizapur, guppies were collected. The male and virgin female were permitted to copulate. Three separate aquaria (20 each) were chosen to receive sixty healthy female fish of uniform size and weight. The experiment included the usage of three 40x3x27 cm tanks. To prevent fish in separate tanks from stimulating each other visually, black plastic walls were used to divide the aquaria. Unwanted artificial light was kept out of the tanks by a black plastic cover. In all trials, the water's temperature was maintained between 24.4 and 25.10 °C. There was constant aeration, sufficient circulation, and filtration of the aquarium water. Water was dechlorinated before to the experiment's commencement. pH was measured titrimetrically once a week. Group A was given 30 days, while Group B and Group C were given the same number of days. Group B receives manufactured food in the form of flake and granules, Group C is given no food at all, and Group A is given natural food in the form of zooplankton and earthworms. To determine the length-weight connection, the gathered fish were measured from top mouth to tailfin at the beginning and conclusion of the experiment. Each fish's body size (Standard length, SL) was measured using a vernier calliper, with each measurement taken to the closest 0.1 mm. When measured, the fish was put to sleep in a 2-phenoxyethanol solution. A fish was weighed up to mg, and the weight of the fish was determined using an electrical monopan balance after data for fish of the specified length was combined.

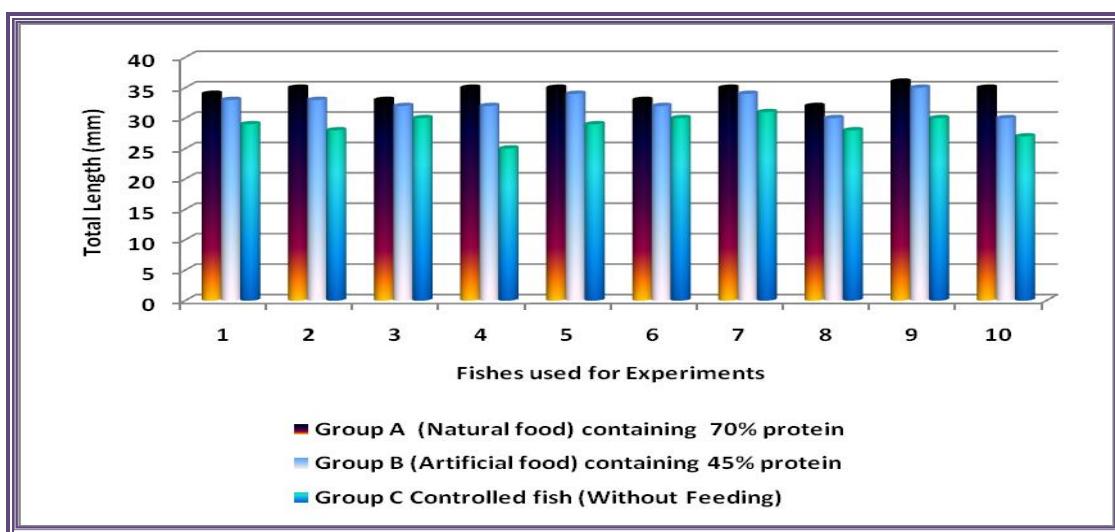
Result and Discussion

The whole body weight and length of the females were measured (Table-1, Graph-1, 2). When comparing group B's diet with fake food to group A's fed with natural food, there were notable differences in body weights and lengths ($P>0.05$; $P>0.05$). As comparison to other group C and group B's total body weight and length were also greater ($P<0.01$; $P<0.001$). Chong, A.S. et al. (2004) conducted similar research. Their research's key discovery was that meal protein levels affected a number of metrics, such as weight gain, the general makeup of brood fish, the quantity and quality of eggs, and larval survivorship. Their research's key discovery was that meal protein levels affected a number of metrics, such as weight gain, the general makeup of brood fish, the quantity and quality of eggs, and larval survivorship. In a related research, James (2002) found that *X. helleri* given 45% animal protein had greater growth and fertility than those fed 35% protein. Pelleted feed included this amount of animal protein. Compared to Group C, which was treated as a control, females from Groups A and B had significantly higher total body weight and length ($P<0.05$; $P<0.001$). During the experiment, female guppy fish from the algae supplemented groups grew larger than those from the controlled groups, and by the end, the length and weight of the algae supplemented groups were approximately 17% higher than the females from the control groups (without feeding).

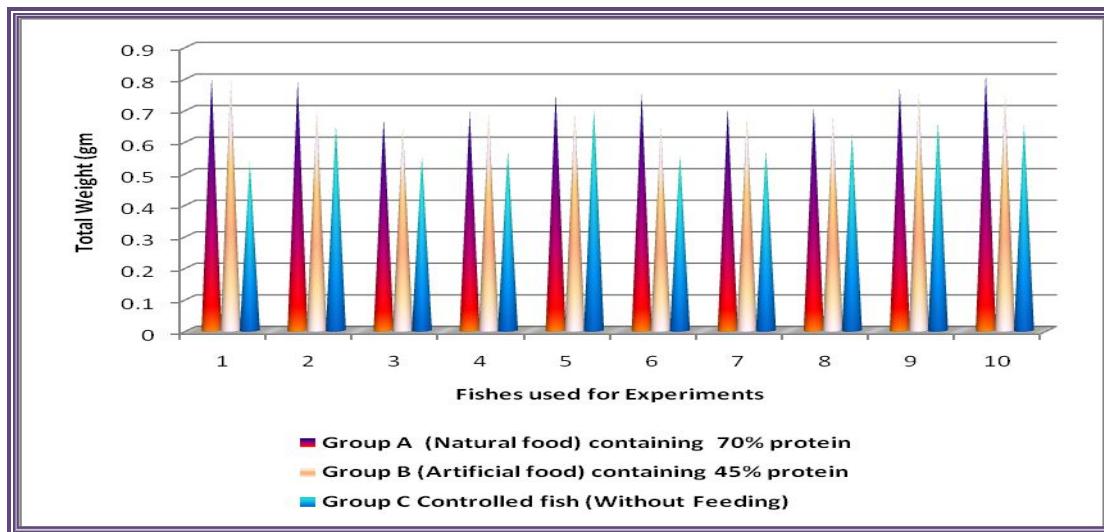
The findings indicated that females given natural foods like daphnia and earthworms had relatively greater body proportions and weights. Previous research by Dahlgren (1980) showed similar findings when the impact of adding different concentrations of *Daphnia* sp. to drum-dried flake feed on the development and fertility of brood stock *Xiphophorus helleri* was assessed. 190 embryos on average per female at the end weight and mean fecundity, which was a substantial increase above the output from the weekly or non-supplemented treatments. The current investigation shows that females fed on a relatively higher protein content had considerably greater individual fecundity. It was discovered that one significant component influencing the success of reproduction is food quality. It is evident from both the current and previous studies that protein levels must be higher than a certain threshold in order to have a substantial impact on reproductive capability. Group A, which was given natural food, had noticeably larger body lengths and weights than group B, which was fed artificial food ($P>0.05$; $P>0.05$). Additionally, group B's total body weight was greater than group C's ($P<0.01$; $P<0.001$).

Table 1 : *Poecilia reticulata* feeds on natural food, artificial food, and neither. Its total length (TL) is measured in millimetres, while its total weight (TW) is measured in grammes.

Group A (Natural Food) Containing 70% Protein		Group B (Artificial Food) Containing 45% Protein		Group C Controlled Fish (Without Feeding)	
TL(mm)	TW(g)	TL(mm)	TW(g)	TL(mm)	TW(gm)
34	0.800	33	0.799	29	0.531
35	0.790	33	0.701	28	0.650
33	0.670	32	0.650	30	0.550
35	0.692	32	0.690	25	0.568
35	0.750	34	0.700	29	0.700
33	0.750	32	0.650	30	0.555
35	0.705	34	0.679	31	0.570
32	0.707	30	0.680	28	0.620
36	0.770	35	0.752	30	0.660
35	0.811	30	0.750	27	0.650



Graph-1. *Poecilia reticulata*'s total length when given (A) natural food, (B) artificial food, and (C) not fed (controlled fish)



Graph-2. Total weight of *Poecilia reticulata* fed with (A) natural food, (B) artificial food, and (C) not fed (controlled fish) is shown

Conclusion:

The effect of natural and artificial food, which vary in terms of protein content, was examined in relation to *Poecilia reticulata* length-weight. Fish in Group A, which received Natural food with 70% protein, had far longer total bodies and heavier total bodies overall. When given fake food with 45% protein, female *Poecilia reticulata* fish were much smaller and lighter than those in Group -A. Fish were much smaller and lighter than those in Group A.

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