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APPLICATION OF LIVE FEEDS IN THE FRESHWATER ORNAMENTAL FISH LARVAE OF *PUNTIUS DORSALIS* (JERDON)

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ABSTRACT

Feeding experiment conducted under laboratory conditions, to determine the suitability of live feed for the larvae of ornamental fish Puntius dorsalis, *shows the increase of specific growth rate and weight gain when they were fed with mosquito larvae (3.284 and 8.04%/day), chironomus larvae (3.308 and 6.24%/day), chopped earthworm (2.659 and 4.391%/day) and plankton (2.618 and 4.39%/day). The maximum growth rate, 0.614 g was observed in mosquito larvae feed followed by chironomus larvae (0.522 g), chopped earthworm (0.411g) and plankton (0.405g) feed. The present study indicates that mosquito larvae could be used as a suitable live feed for feeding* Puntius dorsalis *larval fishes.*

Key words : Puntius dorsalis, *Live feed, Plankton, Chopped earthworm, Mosquito larvae, Chironomus larvae*

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Introduction

Ornamental fishes have gained considerable attention in recent years. The *Puntius* (Cyprinidae) species are of fresh water fishes native to Southeast Asia. Their large scales, bright colors, schooling behaviour and ease of maintenance and breeding have made them popular in the aquarium trade (Clyde S. Tamaru *et al.*, 2001). Freshwater tropic fishes found in Indian waters are known for their vivid colours, their beauty and ability to live in confinement and to consume different varieties of food and peaceful nature. It is evaluated that out of 186 fish species, 62 (33.3%) are considered as only food fish followed by 53 (28.4%) as only ornamental. Farming freshwater tropical fish is a very competitive aquaculture venture. The initial stages of *P. dorsalis* is having eye catching feature of silvery white in colour. The black spots are present in front of the caudalfin on both sides. The adult fishes are having high commercial value. It is commonly called "Long snouted barb". The small scale farmers have successfully substituted low cost live feeds such as planktons, water fleas, tubicid worms, mosquito larvae and chopped earthworm. In ornamental fish farming, live food organisms, especially *Artemia* and rotifers, are extensively used as the main food sources for the larviculture. Both the food organisms are filter feeders and have successfully been applied as biological carriers for transferring essential nutrients to predator larvae (Leger *et al.*, 1986).

The blood worms (chironomus) are ideal live food source to all varieties of ornamental fishes (Jameson and Santhanam, 1996). Samantaray and Mohanty (1997) have formulated pelleted feeds (instead of live feed) to the larvae resulting in poor survival. Since the digestion in post-larvae takes place because of enzymes absorbed from live prey. In the study, we have selected four types of live feeds like, plankton, chopped earthworm, mosquito larvae and chironomus larvae for the assessment of growth and survival.

Materials and Methods

P. dorsalis larvae, weighing 140-170 mg were collected from Tamprabarani river, Tirunelveli, Tamil Nadu. They were maintained at 29°C in cement cisterns and fed with planktons, till the start of the experiment. Feeding trials were carried out for a culture period of 35 days in 50L plastic troughs. Each trough was stocked with 50 larvae, and it was maintained with water temperature of 29 ± 0.5°C, dissolved oxygen 6 to 6.8 mg/l and pH: 6.8 to 7.4 throughout the experiment. Larvae were fed on plankton, chopped earthworm, mosquito larvae and chironomus larvae separately thrice a day (8 hr, 13 hr, 18 hr) *ad libitum*. The water was changed every day. The live feeds were treated with 20ppm formalin for 10-15 min and washed

thoroughly with tap water prior to feeding to avoid introduction of pathogens and parasites which are normally associated with live natural food (Uys and Hecht, 1985).

At the end of the experiment, each fish was weighed and its body length was measured. The specific growth rate (SGR) and weight gain (%) were estimated with the help of following formulas.

Mean growth rate (%/day)

$$= \frac{\text{Final mean weight} - \text{Initial mean weight}}{\text{Initial mean weight} / \text{No. of days}} \times 100$$

Specific growth rate (% /day)

$$= \frac{\text{Log}^{e}\text{ final mean weight} - \text{Log}^{e}\text{ initial mean weight}}{\text{No. of days}} \times 100$$

Weight gain (% /day)

$$= \frac{\text{Mean final fish weight} - \text{Mean initial fish weight}}{\text{Mean initial fish weight}} \times 100$$

Survival rate (%)

$$= \frac{\text{Final total number of fish live}}{\text{Initial total number of fish}} \times 100$$

Result and Discussion

In present study of 35 day experiment, the larvae consumed the live feed well and the acceptability of all the feeds was similar. Data for mean growth rate, specific growth rate and weight gain are presented in Table 1 and they have also been graphically represented in Figs. 1-5. The highest growth rate (36.5 mm length) of

8.04%/day and weight (0.614 g) was observed in *P. dorsalis* larvae fed with mosquito larvae, followed by 6.24 and 4.39 and 4.29%/day those fed on chironomus larvae (33.27 mm length and 0.522g weight), chopped earthworm (31.4mm length and 0.411 g weight) and planktons (30.92 mm length and 0.405 g weight). The highest specific growth rate of 3.82%/day was observed in larvae fed on mosquito larvae, whereas the 3.31, 2.66 and 2.61%/day was noticed in those fed on chironomus larvae, chopped earthworm and planktons. The highest weight gain (8.04%/day) and survival rate (90%) were observed in *P. dorsalis*, fed on mosquito larvae whereas the lowest weight gain (4.29%/day) and survival rate (86%) were observed in those fed on planktons. The similar findings were observed in *Puntius vittatus* fed on mosquito larvae (Jasmine, 2004). Marimuthu *et al.* (1999) reported that the larvae of *Channa striatus* fed on mosquito larvae have the highest growth rate, specific growth rate and weight gain than chironomus larvae and planktons. Dabrowski (1982) suggest that initially, enzymes present in the live prey enhance the digestion in the fish larvae.

Table 1: Growth responses of *Puntius dorsalis* fed on different live feeds.

Parameters	Feed types			
	Planktons	Chopped earthworm	Mosquito larva	Chironomus larva
Initial mean length (mm)	17.2 ± 0.81	17.2 ± 0.74	17 ± 0.66	17.3 ± 0.89
Initial mean weight (g)	0.162 ± 0.02	0.162 ± 0.012	0.161 ± 0.016	0.164 ± 0.011
Final mean length (mm)	30.92 ± 0.036	31.4 ± 1.2	36.5 ± 1.4	33.27 ± 0.96
Final mean weight (g)	0.405 ± 0.036	0.411 ± 0.024	0.614 ± 0.24	0.522 ± 0.21
Mean growth rate (%/day)	4.285	4.391	8.039	6.237
Specific growth rate (%/day)	2.618	2.659	3.824	3.308
Weight gain (%/day)	4.29	4.39	8.04	6.24
Survival	86	88	90	88

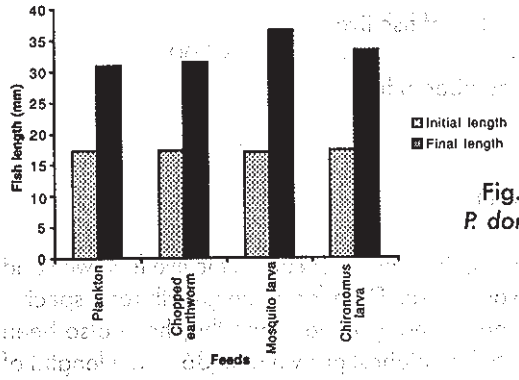

Fig. 1: Growth length (%/day) by *P. dorsalis* fed on different live feeds after 35 days.

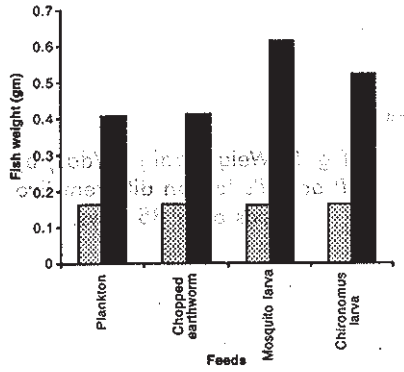

Fig. 2: Growth weight (%/day) by *P. dorsalis* fed on different live feeds after 35 days.

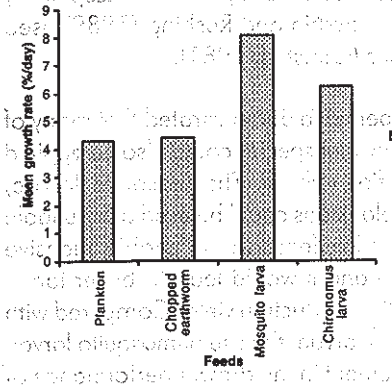

Fig. 3: Mean growth rate (%/day) by *P. dorsalis* fed on different live feeds after 35 days.

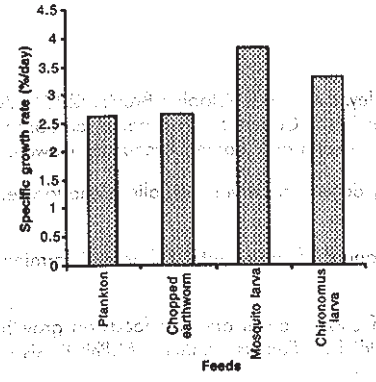

Fig. 4: Specific growth rate (%/day) by *P. dorsalis* fed on different live feeds after 35 days.

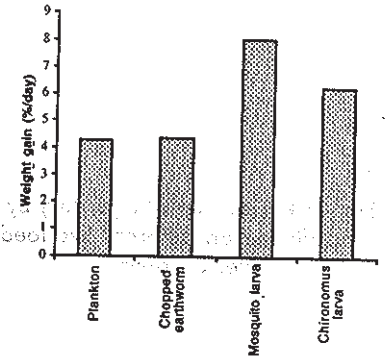

Fig. 5: Weight gain (%/day) by *P. dorsalis* fed on different live feeds after 35 days.

Wilson *et al.* (1981) reported that poor growth rate and feed conversion of these fish could be attributed to the poor digestion and poor assimilation of the diet (or) its unattractiveness. Several studies have been conducted to improve the acceptability and feed consumption of experimental diets. Lovshin and Rushing (1989) used feed attractants for catfish, *Ameiurus nebulosus* (Olmsted, 1981).

The experimental results presented in this paper have demonstrated that many of the live feeds used for larval production of freshwater species could also be applied successfully in the fresh water ornamental fish culture. The mosquito larvae, chironomus larvae, chopped earthworm and planktons could be used as a suitable live feed for feeding early larvae. Use of these live feeds would enable intensive larviculture of the freshwater ornamental fish and it would lead to better larval performance and an exponential increase in the production yield. Compared with plankton, chopped earthworm and chironomus larvae, the use of mosquito larvae for feeding would result in significant improvement in the growth performance of the larvae of *P. dorsalis* and better survival rate.

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