

EFFECTS OF DIFFERENT DIETS ON THE SURVIVAL AND GROWTH OF PUYE (*GALAXIAS MACULATUS*)

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Introduction

Galaxias maculatus ('Puye or angula') is an estuarine and lacustrine fish that lives in cold water of the southern hemisphere. It is particularly appreciated as a glass-eel substitute and its price is between US\$ 28 - 100kg⁻¹ (Vega et. al., 1994). The knowledge on the nutritional management of its larvae under culture conditions is very scarce (Mitchell, 1989). The mass production of postmetamorphic larvae that are able to reach the elver stage is still a challenge.

Newly-hatched puye larvae measure 6 to 7mm total length (Figuerola, 1990) with a small yolk sack, and half opened buccal cavity. The growth and the survival of newly-hatched larvae fed with three types of diets was evaluated. Similar studies were made with larvae 5 days after hatching.

Material and methods

The larvae were obtained in the laboratory after induced spawning. They were kept without temperature control and under a natural photoperiod in fiberglass containers of 3 l with a flow-through of water from a well. The experiments were carried out with a density of 20 larvae.l⁻¹ and a water renewal rate of about 2 times.h⁻¹. Three diets were tested: a commercial trout pellet (starter), microencapsulated eggs prepared according to Chow (1980) and enriched with a premix of minerals and vitamins (1%), and rotifers enriched with three types of microalgae (*Isochrysis galbana*, *Nannochloropsis oculata* and *Chorella* sp.). The inert diets were sifted to a diameter to fit the size of the larvae's mouth. The larvae were fed 6 to 8 times per day. Feeding with rotifers was kept to a concentration of 5 rotifers.ml⁻¹. The diets were tested on newly-hatched larvae and on larvae of 5 days (80-90% of reabsorption of yolk sack) and in larvae 5 days after hatching (80-90% of reabsorption of yolk sack), a group of larvae kept under starvation conditions were used as control. The specific growth rate

(SGR) as defined by Ricker (1975) and the survival were evaluated after 30 days of culture. The experiments were carried out in three replicates and the results analyzed by one way ANOVA.

Results and discussion

The yolk reserve allows a survival during 15 days. Although the larvae reabsorb the yolk sack between the fifth and eighth day, the energy stored allows them to survive 7 or 10 days longer under starvation conditions. When the larvae are fed with inert food, 5 days after hatching, they do not survive more than 20 days. With live food, the survival reached to 60% after 20 days and 2.5% after 30 days (Fig. 1).

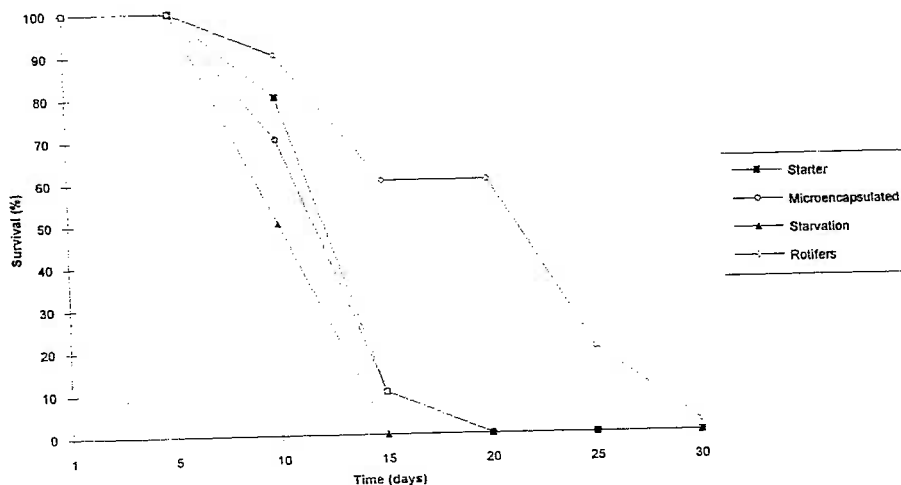


Fig. 1. Survival of puye (*G. maculatus*) larvae fed from the 5th day after hatching with different diets.

The high mortality observed in this experiment might be attributed to a late beginning of the first-feeding leading to malnutrition of the larvae. The survival rates of larvae, that were fed immediately after hatching, were 67.6, 79.2 and 41.5% at 30 days (Table I) with the same types of diets. The best SGR were obtained with microencapsulated eggs, nevertheless, there were no important differences with the other diets (Table I).

The results of this work show that in this species the mouth and the gut are functional very early and that the exogenous feeding of larvae should begin early.

Conclusions

Larvae of puye hatch with a functional mouth and can be fed with inert or live food. The survival may be best when the larvae receive their first-feeding immediately after hatching.

Table I. Growth and survival of puye (*Galaxias maculatus*) larvae fed immediately after hatching with three types of diets during 30 days (Means \pm SD values are provided)

Diets	Replicates	Size		Survival (%)	SGR (%)
		Initial (mm)	Final (mm)		
Starter	R1	6.2 \pm 0.3	7.9 \pm 0.5	62.5	0.80
	R2	6.2 \pm 0.3	7.5 \pm 0.5	45.2	0.63
	R3	6.2 \pm 0.3	7.7 \pm 0.3	95.0	0.72
	Average	6.2 \pm 0.3	7.7 \pm 0.2	67.6 \pm 20.6	0.72 \pm 0.07
	R1	6.2 \pm 0.3		Missing	
Rotifers	R2	6.2 \pm 0.3	7.5 \pm 0.1	5.4	0.63
	R3	6.2 \pm 0.3	7.4 \pm 0.5	77.5	0.59
	Average	6.2 \pm 0.3	7.5 \pm 0.1	41.5 \pm 36.1	0.61 \pm 0.02
	R1	6.2 \pm 0.3	7.9 \pm 0.3	82.9	0.80
	R2	6.2 \pm 0.3	8.5 \pm 0.5	66.7	1.05
Microencapsulated	R3	6.2 \pm 0.3	7.8 \pm 0.3	88.0	0.76
	Average	6.2 \pm 0.3	8.1 \pm 0.3	79.2 \pm 9.1	0.87 \pm 0.13

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