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Comparative study of survival and growth in classical clear water and multi-trophic recirculated systems during *Pseudoplatystoma punctifer* larval rearing

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Pseudoplatystoma punctifer ex. *fasciatum*

INTRODUCTION

Doncella, *Pseudoplatystoma punctifer* ex. *fasciatum*, artificial breeding relies on the adaptation of larvae to dry food (weaning) after a period of brine shrimp (*Artemia* nauplii) feeding. The main objective of the current research was the development of a breeding protocol that reduces the use of *Artemia* nauplii, the weaning period, the adaptation of the larvae to dry feeding and finally decrease mortality during this period. In parallel to the feeding protocol two rearing systems, a classic clear water recirculation system and an integrated multi-trophic aquaculture system, were tested at the IIAP's field station of Quistococha (Peru) to compare survival and growth of sibling larvae over a 36 days period.

MATERIAL & METHODS

Larvae were fed live freshly hatched *Artemia* (3 replicates) from 3 to 15 days post fertilization (DPF) in both environments in 30 L tanks. Then they were weaned with 2 semi-humid inert diets (3 replicates), for an 11-days period (from 16 to 27 DPF) followed by a 8-days period of dry food (from 28 to 36 DPF). Samplings were performed at 15, 27 and 36 DPF. Feeding changes were made progressively over a 3-days period. Total larvae counts and individual sizes were determined from digital photographs of the rearing tanks, subsequently processed using NIH IMAGE J freeware. Mean total length (TL) and survival, calculated for each replicate at each sampling time, were analyzed using one-way ANOVA and post-hoc tests to compare treatments.

RESULTS

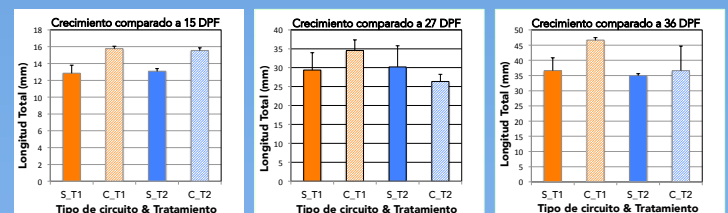


Figure 2. Growth (Total Length) comparisons of *P. Punctifer* juveniles reared in classic recirculated circuit (C) and in multitrophic system (S) at 15, 27 and 36 DPF with two different feeds (T1 and T2)

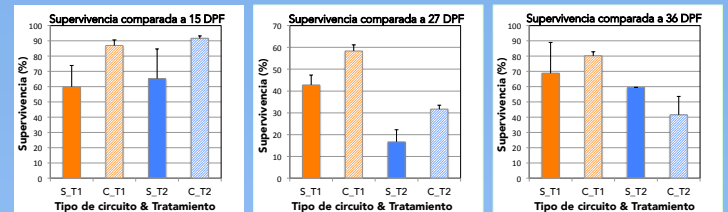
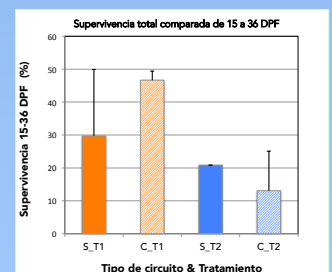


Figure 3. Survival comparisons of *P. Punctifer* juveniles reared in classic recirculated circuit (C) and in multitrophic system (S) at 15, 27 and 36 DPF with two different feeds (T1 and T2)

Figure 4. Global survival comparison of *P. Punctifer* juveniles, fed *Artemia* nauplii for 12 days, reared in classic recirculated circuit (C) and in multitrophic system (S), weaned from 15 to 36 DPF with two different feeds (T1 and T2)



CONCLUSIONS

These results indicated that it was possible to obtain juveniles of about 5 cm (TL) adapted to dry food consumption in 36 days. *Artemia* has proved, in both systems, to be an effective feeding strategy for early larval phase until 15 DPF. Classical clear water system performed better from 3 to 15 DPF, then both systems are comparable in terms of survival, while growth was significantly higher in classical clear water system over the 36-days rearing period with the T2 feed.

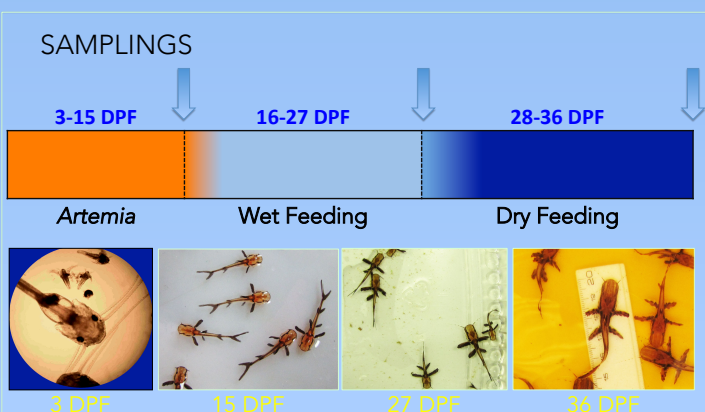


Figure 1. Summary of Experimental Protocol