Parental effects on survival and size variation in larvae of *Pseudoplatystoma punctifer* (Castelnau, 1855) reared in comunal situation

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INTRODUCTION:

Pseudoplatystoma punctifer **is a highly commercial Amazonian catfish due to its excellent flesh quality. Its good growth rate has made of this species an important resource for aquaculture in the Amazonia. Although captive-breeding methodology is well established under controlled conditions, large-scale aquaculture has not yet been implemented. The aim of this study was to evaluatuate of the paternal effect on the survival and growth of the offspring of *P. punctifer* rearing in situation comunal.**

METHODOLOGY:

Four progenies were obtained by combining the eggs of a single female and a pool of sperm from four males. They were raised in communal tanks at 28 ± 0.5 ºC. All families were grown in a recirculating water system and feed from 3 days post fertilization (dpf) with artemia nauplii five times a day every 3 h from 07:30 to 19:30 hours. Mean total length (TL), differential viability and maximum index difference in size were calculated for each family on 3 sampling points (N = 50 in each sampling point) between 1 and 26 dpf (Figure 1) and analyzed by multivariate ANOVA.

RESULTS AND DISCUSSION

The results showed that at 4 hours after hatching (1dpf) there was a clear representation of two families and this was maintained until the end of the experiment (Figures 2 and 3). The first group comprised families 4 and 2 with a high number of individuals (F4 = F2 = 46% and 44%), the second group was formed by the families 3 and 1 that presented the lowest number of individuals (F3 = F1 = 10% and 0%). The formation of two groups (based on their viability) during the monitoring period reflected the genetic quality of the families. The group showing greater viability over the time, might indicate a good genetic quality of the male, whereas the group with lower viability may indicate a low genetic quality of the male. This results showed the importance of both breeders in the early life history of the offspring. Moreover, there was no significant variation on yolk sac volume between the four families (*p* = 0,5871) nor significant differences between variations of head length (*p=0,5295*) and head width (*p=0,4314*) nor total lengh ((*p=0,6107*).

Figure 1: Larvae of *Pseudoplatystoma punctifer* at 1 dpf, 5 dpf and 26 dpf

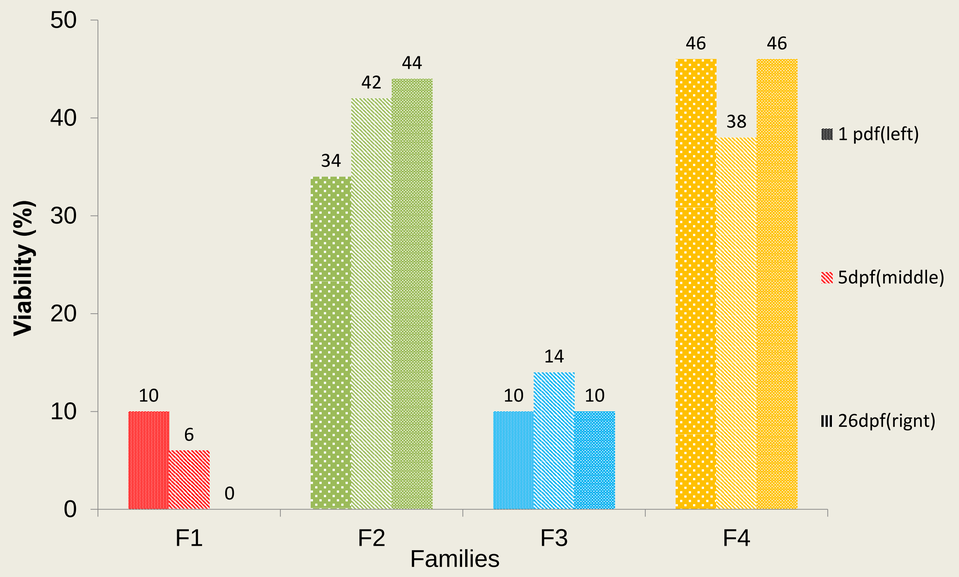

Figure 2: Contribution of each male to fertilization and offspring survival.

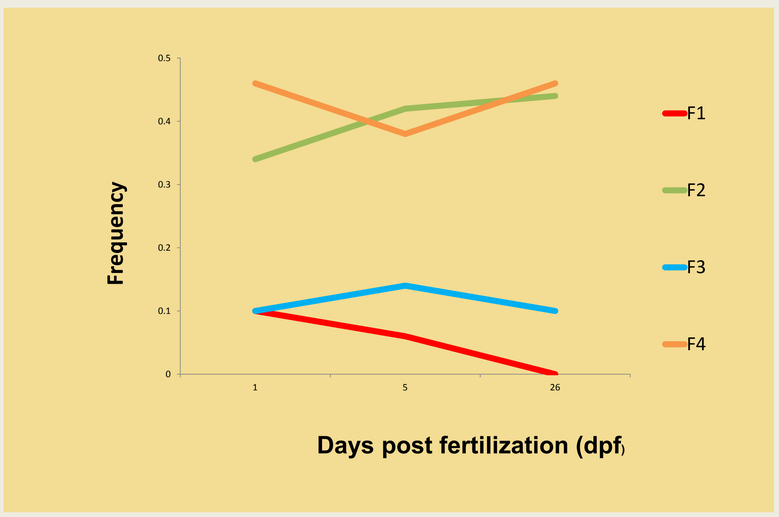

Figure 3: Evolution of the relative frequencies (viability) of the four offspring families of *Pseudoplatystoma punctifer* in communal breeding system.

Table 2: Indicators for maximum differences in size of the families *Pseudoplatystoma punctifer* at 26 dpf

Families	Range of variation		Mean	SD	C.V. (%)	Indicator size maximum difference
	Mínimum	Maximun				
Family 2	13.2	18.1	16.2	1.3	8.2	1.4
Family 3	14.1	17.7	15.9	1.4	9.0	1.3
Family 4	13.8	19.8	16.6	1.4	8.5	1.4

At 26 dpf, all families presented relatively homogeneous size of individuals, showing a low size variability as confirmed by the CV% (Table 2). Therefore the famillies there were no presence of individuals whose size is twice as large as the other (jumpers), which may develop cannibalistic behavior. In this experiment, not showed paternal contribution in the formation of jumpers.

There was no significant correlation between heterozygosity and total lengh. However, the progeny showed an inverse correlation between heterozygosity and viability; that is, the lower heterozygosity, the higher viability (Figure 3). This indicated that families with high level of heterozygosity do not necessarily have a good viability.

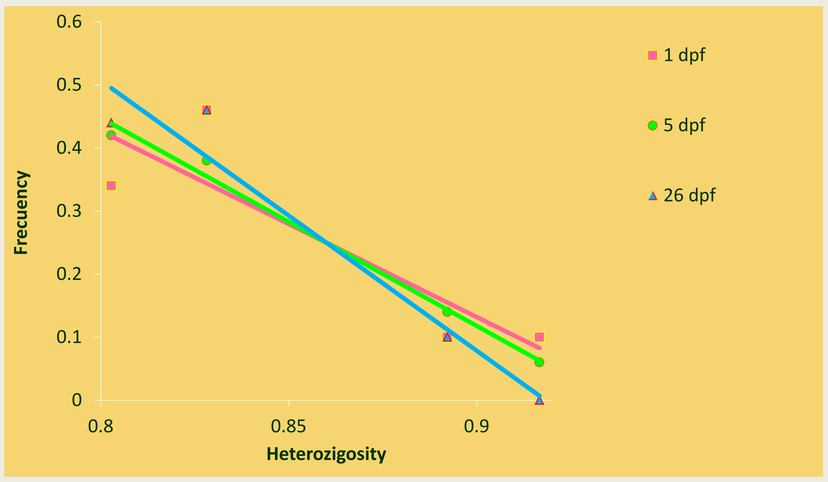

Figure 4: Linear regressions of heterozygosity vs. frequency (viability) for the three successive breeding periods 1 dpf, 5 dpf and 26 dpf

CONCLUSION:

The results of this study showed that male did not influence the range of variation in growth at early life stages (before 26 dpf), but there was evidence that they influenced the offspring viability.