

PUBERTY VARIANCES (MALE x FEMALE) DRIVE HARVEST WEIGHT IN THE AMAZONIAN TAMBAQUI (*COLOSSOMA MACROPOMUM*)

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Introduction

In Brazil, the aquaculture industry is growing continuously as a consequence of the reduction of natural stocks, the constant increase of fish meat demand and the huge potential of the country with its large coast and abundant in land waters. The Amazonian characid tambaqui (*Colossoma macropomum*) is the most commercially important native fish in Brazil, however, its farming is still very traditional and no technologies have been specifically adapted or optimized for the species. For instance, this is the first study aiming at understanding the cellular events that occur during the tambaquis' first maturation and relating this data with the difference in body weight between males and females at market size.

Methods

200 tambaquis were collected from November 2011 to September 2012 (± 12 /month) from a commercial farm in Manaus, Amazonas. Fish were from the same batch and were 2 months old at the beginning of the experiment, weighing 280 gr. Prior to sampling, all fish were anesthetized with Benzocaine 10% and biometrical measurements were made individually. Fragments of gonads were fixed in Bouin's solution and embedded in paraffin. Slides were stained with hematoxylin-eosin for histological analysis. For the last sampling, 40 fish were analyzed for comparison between harvest weights of males and females.

Results and Discussion

All fish were immature until 4 months (mo) old, and gonads were then small and transparent. Spermatogenesis commenced in February (rainy season; fish 5 mo old and 750 gr weigh) and did not take long to be completed, as in less than two months testis full of free spermatozoa in the tubular lumen were common among the males. However, the volume of semen of this pubertal wave was too small (as well as the GSI 0.033 ± 0.02) to be released at abdominal pressure. Three months later males were maturing again, which confirms that in the North of Brazil tambaqui can mature all year long, as opposed to other regions where the breeding season is restricted to the rainy season. Females were immature until the end of the study (3.0kg; harvest weight), and entered meiosis with the formation of diplotene (present still in nests with oogonia) at weight of approximately 1.5 kg (8 mo old). With further folliculogenesis and oocyte primary growth, new oocytes were continuously recruited; however, they did not surpass the perinucleolar phase. At harvest, females were significantly heavier (guttated weight) than males, in the order of 21%.

Conclusion

There is an asynchronous incidence of puberty between males and females of tambaqui reared on a commercial scale. While males commence spermatogenesis earlier and finish it quicker than females, the later do not reach maturation at harvest size (3kg). This divergence seems to be responsible for the difference of body weight between females and males of farmed tambaqui, rendering the former the most profitable gender to be cultivated in terms of aquaculture industry.