GROWTH AND SURVIVAL OF JUVENILES OF TAMBAQUI

EXPOSED TO DIFFERENT PHOTOPERIODS

Paulo Henrique Rocha AridеINPA / LEEM. Av André Araújo, 2936
Manaus-AM. CEP 69083-000 Brazil
Tel. (92) 643-3190/643-3187.
E-mail pauloh@inpa.gov.br

Michel Catarino[1] and Adalberto Luís Val[2]
INPA / LEEM. Av. André Araújo, 2936,
Manaus-AM. CEP 69083-000 Tel. (92)643-3190/643-3187
1. E -mail catarino@inpa.gov.br
2. E -mail dalval@inpa.gov.br

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Introduction

The Amazon basin is the largest fluvial system of the world, draining about 37% of continental South America. The flood pulse is the main factor that influences the central Amazon areas characterized by a great variation in the water level and changes in ecological and physico-chemical parameters, such as pH of water, transparency, photoperiod, ion levels and dissolved oxygen. In the Amazon area we can find extremely different conditions among its three main types of waters: white waters (pH 6,2-7,2), black waters (pH 3,8-4,9) and clear waters (pH 4,5-7,8), according to Sioli (1984).

Tambaqui is widely distributed across South America. Tambaqui reaches a weight of more than 30 kg in wild. Its feeding habit (juvenile phase) ranges from the consumption of seeds and fruits during the rainy season to zooplankton and wild rice during the dry season. The flooded forest is the major representative habitat of tambaqui in the Amazon Basin, and this species occur in all types of Amazon waters.

The responses of fish to changing photoperiod include changes of rhythms of feeding and growth. Alterations of photoperiod are used to stimulate or delay gonodal maturation, and thus changing spawning period or somatic growth (decreasing energy drain for reproduction) (Lam, 1983). For example, Atlantic salmon (*Salmo solar*) show an increased growth when exposed to extended day length, but another salmonid, the Artic charr (*Salvelinus alpinus*), may fed and grow well even in complete darkness (Jorgensen and Jobling, 1989). Silver catfish (*Rhandia quelen)* achieved better growth when exposed to continuous darkness (Piaia *et al*., 1999).

The present communication describes the effect of three different photoperiods (control 10:14h light:dark, darkness 24h dark and light, 24h light) on growth and survival of juveniles of *Colossoma macropomum.*

The fish were distributed among six aquaria of 500l with 10 fish per aquarium (two replicates per treatment). The fish were exposed to continuous light, normal photoperiod (10h L and 14h D), and darkness (24h D) for 42 days. The aquaria water was maintained at 25 (±1)^{o}C and continuously aerated by 40W air pumps which promoted water circulation through a plastic mesh and stones to reduce water turbidity.

Fish were fed *ad libitum* once a day on ground commercial dry pellets (Purina 26% protein, digestible energy 2700 kcal/kg, water content of 13%, according to the manufacturer's instructions). Data are expressed as means (SE) and were analyzed by one-way ANOVA.

Results and Discussion

The effect of photoperiod on the growth of fishes is probably related to the feeding and social habitats. Fish with nocturnal feeding habit, like catfishes, or those species that are aggressive, may increase food intake when held in darkness, whereas those with a diurnal habit may grow better on extended photoperiods. African catfish larvae (Britz & Pienaar, 1992) and Channel catfish (*Ictalurus punctatus*) showed better growth rates when exposed to continuous darkness. The Atlantic salmon (*Salmo solar*) show increased growth when exposed to extended day length (Berg *et al.*, 1992).

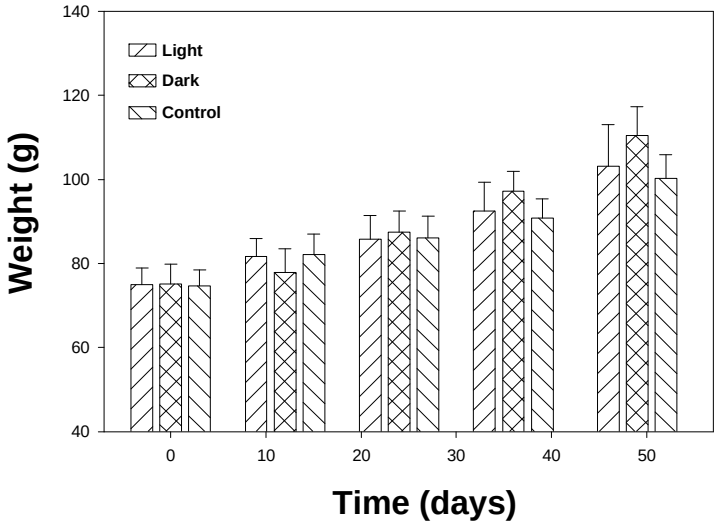

Figure 1. Effect of photoperiod on weight of *Colossoma macropomum* exposed to continuous light (24hs light), normal photoperiod (10:14 light:dark) and darkness (24hs dark). Values indicated are means (SE) of two replicates.

There was no mortality during the experiment with *Colossoma macropomum*. Weight of the fish reared in darkness were similar to those exposed to continuous light (Figure 1). Tambaqui is not usually described as an aggressive species. In wild, tambaqui experiences different conditions in water transparency. During high river water levels the animals can be found in the flooded forest where sunlight hardly reaches water surface and so the animals are exposed to dark. The animals living in várzea lakes where macrophytes cause extensive shadow face similar condition. This situation differs from that observed during low river water levels. However, the data presented here indicate that there is no significant change in growth rate of juveniles of tambaqui living in these different conditions.

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