

Seasonality of reproduction of *Piaractus brachypomus* in South Bolivia

by

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ABSTRACT. - The reproductive period of *Piaractus brachypomus* is short in South Bolivia. This area is close to the Southern limit of the species and conditions favourable to its reproduction last for only a few months. In order to increase fry production, we studied the possibility of extending its spawning period in captivity.

Key words. - *Piaractus brachypomus* - Seasonality - Reproduction - Vitellogenesis.

Introduction

Aquaculture of Tambaquí, *Piaractus brachypomus*, a low trophic level species, is developing in all Amazonian countries. Spawning of Tambaquí in the wild was reported to be restricted to December-January in South Bolivia, which corresponds to the southern distribution limit of the species. In order to try to extend this spawning period in captivity, we followed-up the reproductive parameters of Tambaquí held at two different temperature regimes for one year. We also investigated the minimal time interval between two consecutive spawnings.

Material and methods

Two groups of 15 broodfish, 10 females and 5 males were placed in two 100-m² ponds, one covered with a greenhouse, the other uncovered. Sexual maturity was evaluated monthly by sperm emission during gentle stripping of males and by ovarian biopsy of females, which were also blood sampled for further analysis of vitellogenin (Vtg) plasma levels. Three females of each group, found with post vitellogenic oocytes were induced for ovulation using LHRHa (Buzerelin acetate; 5 µg kg⁻¹) injections. These females were used for a second induced breeding as soon as their modal oocyte diameters reached their maximum values again.

Results and discussion

Mean temperature was similar in both ponds, but temperature variations were lower in the covered one (Fig. 1). Oocyte diameter distributions and Vtg levels were not significantly different between groups. Oocyte recruitment and growth were observed year round since oocyte modal diameter showed only a limited fluctuation range. Thus, there was no period of total sexual inactivity for females. Nevertheless, high variations in plasma Vtg levels were observed in both groups with clear peaks during the warm season. Males were found without milt from April to September, but the proportion of males with expressible semen was improved by covering the pond (Fig. 1).

After induced ovulation, females developed a new batch

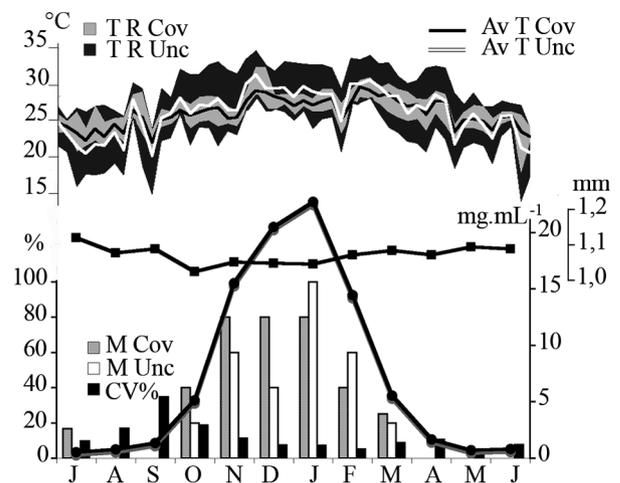


Figure 1. - Seasonal variation of modes (■, mm) and coefficients of variation (CV%) of oocyte diameters, Vtg levels in females (●, mg mL⁻¹) and proportion of males encountered with semen in covered (M Cov, %) and uncovered (M Unc, %) pond. Seasonal variation of Temperature Range in Covered pond (T R Cov), Temperature Range in Uncovered pond (T R Unc), Week Average Temperature in Covered (Av T Cov) and Uncovered pond (Av T Unc).

of mature oocytes in about 10 weeks and responded positively to a second hormonal induction with similar performances.

The coefficient of variation of oocyte diameter varied seasonally. It appeared as a good parameter to evaluate female readiness together with the modal oocyte diameter.

Conclusion

In south Bolivia, the reproductive activity of Tambaquí peaks when water temperature exceeds 25°C. Limiting water temperature variations by covering the pond did not extend the reproductive season of females, but had a slight effect on males. Nevertheless, females with mature oocytes were observed throughout the year and individuals induced to spawn developed a new batch of vitellogenic oocytes in ten weeks. These results indicate that controlling external factors may allow reproduction all year round.

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