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Reproductive strategy of *Microglanis garavelloi* (Pisces: Pseudopimelodidae) a newly discovered small catfish from the upper Paraná River basin, State of Paraná, Brazil

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This study is the most comprehensive on the reproductive strategy of *Microglanis garavelloi*, including abundance of individuals, body length, sex proportion, description of female and male external morphology, gonadal development stages, fecundity, the mean length of first gonadal maturation, and reproductive seasonality. A total of 559 specimens of *Microglanis garavelloi* were collected monthly, from October 2010 to September 2011, in the Couro de Boi Stream, Paranapanema River basin. The sexual proportion was 1 : 1 (259 females and 300 males; $t = -0.756$, $P > 0.05$). Females were larger than males, reaching 40.5 mm SL vs. 33.7 mm SL in males. The mean length of first gonadal maturation was 24.5 mm SL for females and 23.1 mm SL for males. Specimens of the larger-sized classes were more abundant in January (composed of 95 % of adults; mean = 30.2 ± 2.68 mm SL) and smaller sizes in February (92 % juveniles; mean = 15.3 ± 2.52 mm SL). Reproductive females showed a dominance of large vitellogenic oocytes in the final stage with a mean diameter of 1.15 mm, and relative fecundity of 12.8 ± 1.02 oocytes/SL, resulting in low fecundity. According to gonadosomatic index analysis, females and males have sexual maturation synchronism, seasonal reproductive strategy, spawning occurring in the summer, with the reproductive peak in January, coinciding with the hottest and wetter season. The species is non-territorial and promiscuous, as evidenced by the capture of several co-occurring specimens of both sexes in a small place. Management actions are suggested to preserve this species with restricted distribution.

Introduction

Microglanis is the most species-rich genus of the family Pseudopimelodidae (29 species, Souza-Shibatta et al., 2018). However, the biology of *Microglanis* species is still far from satisfactorily known (Shibatta, 1998, 2003). One of the critical studies on reproductive features of *Microglanis* species is Gomes (1946), who recorded mature ovaries in *M. iheringi*, refuting the hypothesis that the specimens identified as *Microglanis* were juveniles of *Pseudopimelodus*. Later, Winemiller (1989) provided details on the reproduction of *M. iheringi*, pointing out that its low fecundity and seasonal reproductive strategy.

Microglanis garavelloi is a small and relatively newly discovered catfish species with a rarefied distribution in the upper Paraná River basin (Shibatta & Benine, 2005). Typically, this species forms small groups in restricted areas on stream

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