Reproductive performance of the Mesa silverside (*Chirostoma jordani* Woolman, 1894) under natural and controlled photoperiods

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**ABSTRACT:** *Chirostoma jordani* is a native annual species inhabiting lacustrine waters of the Central Mexico Plateau. It is widely distributed and is currently facing high environmental pressures. Five experiments were performed to study the reproductive performance of this species. Four of the experiments were conducted in 270-L indoor recirculation tanks. Two males and one female at the first stage of reproduction were included in each test. A photoperiod of 14 light hours and 10 dark hours was used. In a fifth experiment, 10 females and 15 males were kept in an outdoor 3,000-L recirculation tank under natural photoperiod. The number of spawns, fertilised eggs and 30-day-old juveniles were counted and the survival rate was calculated. The results indicated significant differences (*P*<0.05) between treatments. Higher spawn numbers and greater egg production were observed under controlled photoperiod, and higher numbers of juveniles and a higher survival rate were observed under natural photoperiod. The trials exhibited different patterns of egg production during the experiment. The egg production in the natural-photoperiod trials followed a polynomial curve model. In contrast, the trials under the controlled photoperiod showed an irregular pattern of increases and decreases in egg production.

**Introduction**

The Mesa silverside (*Chirostoma jordani*), known as ‘charal’ in its native Mexico, has a broad distribution in the Central Mexico Plateau. Historically, the ‘charal’ species group has been considered of high economic, social, cultural and ecological importance (Álvarez del Villar, 1970; Miller *et al.*, 2005). Many indigenous groups that settled and are distributed along the Lerma-Chapala-Santiago river system depend almost exclusively on the ‘charal’ fishery, which represents an important food and economic resource for these human populations. Currently, ‘charal’ populations are decreasing due to habitat modification, human and industrial contamination, overfishing, and, especially, interactions with introduced, non-native species (Miller *et al.*, 2005). As a consequence, the charal requires immediate attention to maintain and preserve its natural populations.