Poeciliid Research

Silent victims of pollution: *Cnesterodon decemmaculatus* (Jenyns, 1842) exposes reproductive risks of endocrine disruptors in urban-industrial areas

[1,2,3]I. Valentin Petrescu-Mag

[1] Department of Environmental Engineering and Protection, Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Cluj-Napoca, Romania; [2] Bioflux SRL, Cluj-Napoca, Romania; [3] University of Oradea, Oradea, Romania. Corresponding author: I. V. Petrescu-Mag, zoobiomag2004@yahoo.com

Abstract. This news article examines the impact of endocrine-disrupting chemicals (EDCs) on *Cnesterodon decemmaculatus*, revealing a high prevalence of masculinized females in polluted urban-industrial areas. Masculinization led to disrupted reproductive success, with offspring mortality reaching 96%. The findings highlight *C. decemmaculatus* as a sentinel species for monitoring EDC pollution and emphasize the need for stricter environmental regulations to protect aquatic ecosystems and public health.

Key Words: *Cnesterodon decemmaculatus*, masculinization, reproductive success, aquatic pollution, sentinel species.

An investigation, conducted by Nicolás Vidal, Marcelo Loureiro, Andrea Cecilia Hued, Gabriela Eguren, and Franco Teixeira de Mello, focused on the impact of anthropogenic pollution on the freshwater fish species *Cnesterodon decemmaculatus* (Jenyns, 1842). The research team is affiliated with the Universidad de la República in Uruguay and the Universidad Nacional de Córdoba in Argentina, institutions renowned for their expertise in ecological and environmental sciences. Their goal was to explore the effects of endocrine-disrupting chemicals (EDCs) on the species, particularly the phenomenon of female masculinization, and to assess its implications for reproductive success and population sustainability (Vidal et al 2018).

The researchers discovered a high prevalence of masculinized females (Figure 1), especially downstream from urban-industrial areas where pollution was most intense. At one site, more than 87% of females displayed male-like characteristics, including elongation and fusion of anal fin rays. These abnormalities were quantified using a masculinization index, which was notably higher in polluted areas compared to upstream or less affected sites (Vidal et al 2018). Laboratory experiments revealed that masculinized females exhibited male mating behaviors, further indicating endocrine disruption. However, this masculinization came at a cost: masculinized females showed significantly reduced reproductive success, with their offspring experiencing mortality rates as high as 96% within 30 days, compared to 22% for normal females (Vidal et al 2018). Additionally, complications during birth, likely due to structural changes in the anal fin, resulted in the death of both masculinized females and their progeny in some cases (Vidal et al 2018).

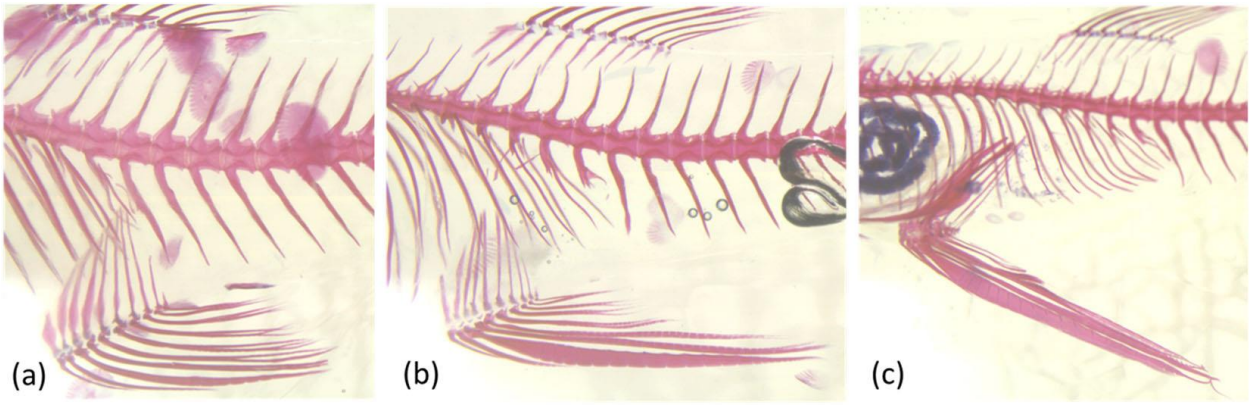

Figure 1. Cleared and stained bony tissues of midsections of adults of *Cnesterodon decemmaculatus*: a) normal female, b) masculinized female showing elongated anal fin rays and c) normal male (Vidal et al 2018).

This research underscores the utility of *C. decemmaculatus* as a sentinel species for monitoring aquatic ecosystems affected by EDCs (Baudou et al 2021; Zambrano et al 2023). Its widespread distribution, resilience to polluted environments, and ease of handling in laboratory conditions make it an excellent model for assessing the ecological impact of industrial and urban waste (Vidal et al 2018). The study's findings have broader implications for understanding how pollution can disrupt reproductive systems, not only in wildlife but potentially in human populations as well. By highlighting the mechanisms and consequences of endocrine disruption, the study contributes valuable insights into environmental conservation and public health, emphasizing the urgent need for stricter regulation of industrial and urban waste management.

Conflict of interest. The author declares no conflict of interest.

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Authors:
Ioan Valentin Petrescu-Mag, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Faculty of Agriculture, Department of Environmental Engineering and Protection, 3-5 Calea Mănăştur Street, 400372 Cluj-Napoca, Romania, e-mail: zoobiomag2004@yahoo.com

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