Can prey fish (*Poecilia vivipara*) develop the ability to recognize invasive predators through experience?

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RESUMO

The lack of shared evolutionary history during novel interactions can result in native prey being unable to recognize invasive predators, in a process known as prey naivety. While naivety can be harmful for prey, the coexistence with novel predators can lead to the acquired ability to recognize and react to them. To test this hypothesis, we performed an aquarium experiment, exposing groups of the native fish *Poecilia vivipara* to visual cues from an invasive predator (*Cichla kelberi*) and a native predator (*Hoplias malabaricus*), while measuring the antipredator responses of *P. vivipara*. The tested individuals originated from two populations, one from the Doce River Basin and the other from the Paraopeba River Basin. While both populations have historically coexisted with *H. malabaricus*, only the Doce Basin population has coexisted with *C. kelberi*, for approximately four decades. We expected both populations to respond to the native predator, while only the Doce Basin population would respond to the invasive predator. While populations differed in their antipredator responses, these differences were not limited to the invasive predator, preventing us from corroborating our hypothesis. The Doce Basin population responded to all experimental cues, including the control conditions (i.e., without any predator), suggesting neophobia, a generalized fear of unfamiliar cues. Neophobic responses can help prey respond more effectively to novel predators and may have been selected in this population due to the high predation pressure exerted by invasive predators. Alternatively, the Paraopeba Basin population did not respond to any treatment cues, suggesting responses might depend on the level of perceived threat. Furthermore, this higher response threshold could be related to the lower levels of predation pressure experienced by this

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population. Our results offer new insights into how invasive predators influence the antipredator behaviors of native prey and suggest that neophobia may enhance prey resilience to invasions.

Palavras-chave: Prey naivety, Biological invasions, Predator-prey interactions, Neophobia, Freshwater fish.

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