Hormone-mimicking chemicals cause inter-species mating

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Hormone-mimicking chemicals released into rivers have been found to impact the mating choices of fish, a new study has revealed. The controversial chemical BPA, which emits oestrogen-like properties, was found to alter an individual's appearance and behavior, leading to inter-species breeding. The study, published in *Evolutionary Applications*, reveals the threat to biodiversity when the boundaries between species are blurred.

The research, led by Dr Jessica Ward from the University of Minnesota, focused on the impact of Bisphenol A (BPA) on Blacktail Shiner (Cyprinella venusta) and Red Shiner (Cyprinella lutrensis) fish which are found in rivers across the United States. BPA is an organic compound used in the manufacture of polycarbonate and other plastics. It is currently banned from baby bottles and childrens' cups in 11 U.S. states.

"Chemicals from household products and pharmaceuticals frequently end up in rivers and BPA is known to be present in aquatic ecosystems across the United States," said Ward. "Until now studies have primarily focused on the impact to individual fish, but our study demonstrates the impact of BPA on a population level."

The team collected individuals of both species from two streams in the state of Georgia. The species were kept separated for 14 days in tanks, some of which contained BPA. On the 15th day behavioral trials were undertaken as individuals from different tanks were introduced to each other.

The scientists monitored any physiological or signalling differences the individuals displayed, such as colour, as well as any behavioral differences during courtship, such as mate choice.

BPA disrupts an individual's endocrine system, which controls the release of hormones. This impacts behavior and appearance, which in turn can lead an individual to mistake a newly introduced species as a potential mate.

This process poses long-term ecological consequences, especially in areas threatened by the introduction of invasive species. BPA and other hormone-mimicking chemicals can escalate the loss of native biodiversity by breaking down species barriers and promoting the invader.

"Our research shows how the presence of these manmade chemicals leads to a greater likelihood of hybridization between species," concluded Ward. "This can have severe ecological and evolutionary consequences, including the potential for the decline of our native species."

More information: Ward, J.L, Blum, M.J, Exposure to an environmental estrogen breaks down sexual isolation between native and invasive species, *Evolutionary Applications*, July 2012, DOI: 10.1111/j.1752-4571.2012.00283.x

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