

Antidepressants pose risk for the survival of fish

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Fish populations around the world are at risk due to growing levels of pharmaceutical contamination in waterways, according to an international team of researchers from Monash University, the

University of Western Australia (UWA), the Swedish University of Agricultural Sciences, and New York University.

The findings, published today in *Proceedings of the Royal Society B: Biological Sciences*, reveal that [water pollution](#) by the antidepressant fluoxetine (Prozac) compromises resilience in [fish populations](#) by dramatically reducing differences in the behavior of individuals.

Fluoxetine—which is used in the treatment of depression and [obsessive-compulsive disorder](#)—is one of the world's most prescribed psychotherapeutic drugs, and a common environmental contaminant of surface waters globally.

Research collaborator and Australian Research Council (ARC) Future Fellow, Professor Bob Wong, from Monash University's School of Biological Sciences, said the impact of drugs making their way into rivers, lakes and drinking water is not well understood and could be easily overlooked.

"We live in an increasingly toxic world," Professor Wong said.

"As one area of concern, vast quantities of drugs taken by humans and animals make their way into rivers, lakes, and even drinking water," he said.

"The diverse impacts of these chemicals are not well understood and can easily be overlooked.

"Pharmaceuticals are specifically designed to elicit [biological effects](#) at low concentrations, so it's no surprise that their impact spreads to non-target species."

The study found that very low concentrations of the contaminant caused

animals to behave similarly to one another, and blurred their behavioral fingerprints.

It was conducted as part of an international collaboration led by Forrest Foundation Fellow and UWA researcher, Dr. Giovanni Polverino.

The research team carried out experiments at Monash University on fish that had been exposed to fluoxetine for multiple generations as part of a long-term study funded by the ARC.

"For fish populations to thrive in the face of environmental change, members of a group need to behave differently from each other," said Dr. Polverino.

"If a fish takes the wrong decision and dies, some others will survive by taking different actions."

The research found that such behavioral diversity is eroded in fish populations exposed to fluoxetine, and might place large groups of fish at an [increased risk](#) of perishing in a changing and increasingly polluted world.

Future research will help scientists understand how water contaminants influence other individual traits, such as metabolism, reproduction and ultimately, survival.

More information: Psychoactive pollution suppresses individual differences in fish behaviour, *Proceedings of the Royal Society B*, [rspb.royalsocietypublishing.org1098/rspb.2020.2294](https://rspb.royalsocietypublishing.org/doi/10.1098/rspb.2020.2294)

Provided by Monash University

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