

Higher temperatures may decrease antidepressant pollution in waterways

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Researchers investigated how tiny water fleas (*Daphnia magna*) were affected by both fluoxetine and temperature increases. Credit: Lucinda Aulsebrook

A new study led by Monash University biologists has found that higher temperatures may reduce effects of antidepressant pollution on wildlife.

However, the study emphasizes this does not mean that global warming is a good thing.

Hundreds of pharmaceuticals end up in the environment after human use, and scientists are learning about how this affects wildlife in conjunction with other phenomena such as increasing temperatures.

In the study published today in the journal *Proceedings of the Royal Society B*, researchers describe the effects of [fluoxetine](#), the [active ingredient](#) of the commonly prescribed antidepressant Prozac, and whether these effects change when [temperature](#) is increased.

Lead study author Lucinda Aulsebrook, a Ph.D. candidate in the Monash School of Biological Sciences said fluoxetine is being increasingly found in low concentrations in waterways and lakes, due to being discharged from sewerage treatment systems.

"Scientists have discovered many effects of the drug on wildlife but have often overlooked how these effects may depend on other factors in the environment," Lucinda said.

"In [natural ecosystems](#), animals are not just experiencing pharmaceutical pollution, but many different stressors—both natural and man-made," she said.

"Climate change is resulting in increasing temperatures worldwide, so we need to consider how this may be affecting wildlife in conjunction with pollutants such as fluoxetine."

Lucinda and her colleagues investigated how tiny aquatic crustaceans

called water fleas (*Daphnia magna*) were affected by both fluoxetine and [temperature increases](#).

The research found that exposure to environmentally realistic concentrations of fluoxetine—just 30 nanograms per liter—resulted in changes in [body size](#) and offspring production in the water fleas at 20 degrees Celsius. When the temperature was increased to 25 degrees Celsius, however, these effects were no longer present.

"This really demonstrates how important it is to consider all the different factors present in the environment," Lucinda said.

"An increase of just 5 degrees Celsius was sufficient to dramatically reduce the impact of fluoxetine.

"Our research highlights the fact that the documented effects of any chemical pollutant may be context dependent, and many different variables can influence the results."

More information: Lucinda C. Aulsebrook et al, Warmer temperatures limit the effects of antidepressant pollution on life-history traits, *Proceedings of the Royal Society B: Biological Sciences* (2022). [DOI: 10.1098/rspb.2021.2701](https://doi.org/10.1098/rspb.2021.2701)

Provided by Monash University

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