

Researchers highlight negative impact of antidepressants on aquatic life

April 3 2014, by Bob Yirka



Gammarus roeseli. Credit: Michal Mañas

(Phys.org) —Two teams of researchers have published separate papers in the journal *Aquatic Toxicology* regarding the negative impact of antidepressants on aquatic life. In the first paper, Peter Fong and Alex Ford offer a review of the findings of other research teams which have shown that even very small amounts of such pharmaceuticals can cause dramatic problems with animals that live in the sea. In the second paper, another team describes problems created by the antidepressants

fluoxetine and sertraline on sea creatures.

Over the past half-century scientists have developed all manner of drugs to help combat depression in patients the world over. But such medications are now being found to have an unintended consequence—they're causing problems with [sea life](#). Antidepressants show up in the urine of people who take them (and the pills themselves are sometimes flushed) and subsequently make their way to sewage treatment plants where they are sent into rivers and streams, and eventually to the ocean. Antidepressants are a specific problem for marine life because they contain serotonin—a chemical that is known to help relieve depression, but which also causes color changes in prawns and mussels and can also make them grow larger and reproduce more rapidly.

In their paper, Fong and Ford assert that evidence is mounting that proves that smaller concentrations in water can cause problems for sea life than had been previously thought—in many cases as little as "one nanogramme per litre." That means, they note, that [aquatic life](#) in virtually every river, stream, lake and ocean is being impacted.

In the second study, the team found that tiny amounts of [antidepressants](#) in seawater can cause both behavioral and transcriptional changes in amphipods. Shrimp become more active, freshwater snails can lose their ability to anchor themselves to a stable object—zebra mussels have been shown to spontaneously spawn. The variety of impact seems limitless.

There are a myriad of chemicals being flushed down toilets across the globe, of course, some of which pose far more of a threat to marine life than others. Antidepressants, because of their nature, and though they make up just 4 percent of the total, appear to pose one of the more serious problems, and sadly, there is no plan in the works to curb the release of such chemicals into the world's waterways. Researchers with

both teams suggest that the matter be taken more seriously before serious consequences result

More information: The biological effects of antidepressants on the molluscs and crustaceans: A review, *Aquatic Toxicology*, Available online 11 December 2013. [dx.doi.org/10.1016/j.aquatox.2013.12.003](https://doi.org/10.1016/j.aquatox.2013.12.003)

Behavioural and transcriptional changes in the amphipod *Echinogammarus marinus* exposed to two antidepressants, fluoxetine and sertraline, *Aquatic Toxicology*, Available online 12 December 2013. [dx.doi.org/10.1016/j.aquatox.2013.11.025](https://doi.org/10.1016/j.aquatox.2013.11.025)

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