

Researchers link algae to harmful estrogen-like compound in water

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University of Tennessee, Knoxville, researchers have found that blue-green algae may be responsible for producing an estrogen-like compound in the environment which could disrupt the normal activity of reproductive hormones and adversely affect fish, plants and human health. Previously, human activities were thought solely responsible for producing these impacts.

Theodore Henry, an adjunct professor for UT Knoxville's Center for Environmental Biotechnology and faculty at the University of Plymouth, and his colleagues looked into blue-green [algae](#), or [cyanobacteria](#), and their effects on zebrafish. They discovered the algae may add a new harmful element into the way they understand and investigate alga blooms in aquatic systems.

Using funding from the National Oceanic and Atmospheric Administration (NOAA) Ecology of [Harmful Algal Blooms](#) (ECOHAB), the scientists uncovered how exposure to the blue-green algae called Microcystis induced a response consistent with exposure to estrogen-like compounds in larval fish.

The research can be found in the article "Global [Gene Expression Profiling](#) in Larval Zebrafish Exposed to Microcystin-LR and Microcystis Reveals Endocrine Disrupting Effects of Cyanobacteria" in the American Chemical Society's journal, [Environmental Science & Technology](#).

Researchers compared groups of larval zebrafish exposed to Microcystis cells with those exposed to just the well-studied toxin they produce and found that only the fish in contact with the blue-green algal cells tested positive for a well-studied estrogenic biomarker. This led them to conclude the algal blooms were producing a previously unrecognized substance which is an estrogen-like compound that acts as an endocrine disruptor.

"The induction of these genes is consistent with presence of an estrogen and it is possible that many adverse affects may occur in fish populations," said Henry, "from physical feminization of male fish to behavioral changes, increased environmental estrogen levels can impact male territorial defending and even their nest-building habit. Environmentally released estrogen has not been shown to affect reproduction, but studies are still being conducted on the subject."

Possible human health effects include skin rashes, fever and liver damage. Henry and colleagues note that harmful blooms of toxin-producing algae occur in waters throughout the world and are a growing health and environmental concern. As a result, the scientists are calling for a revision of environmental monitoring programs to watch for these new substances.

Provided by University of Tennessee at Knoxville

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