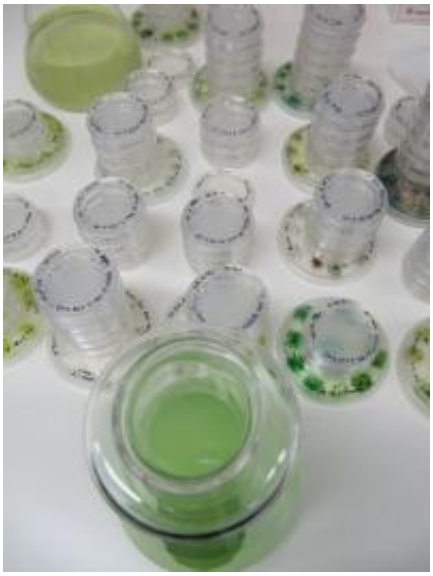
Using ultrasound to control toxic algal blooms

July 7 2010



(PhysOrg.com) -- University of Adelaide researchers are investigating the use of ultrasound as an environmentally friendly and cheaper alternative to controlling blue-green algae in our fresh water supplies.

In collaboration with water industry organisations including SA Water, the researchers are starting a three-year project to find the best process for using ultrasound in large volumes of water to combat this significant world-wide water quality problem.

Chief Investigator Dr Carl Howard, from the University's School of Mechanical Engineering, says researchers will be testing different amplitudes and frequencies of ultrasound.

"We've already shown in laboratory tests that ultrasound is effective at neutralising blue-green algae," says Dr Howard.

"We know it works but we don't yet know the best frequencies, amplitudes and duration for the most effective, economic and efficient process."

Blue-green algae (or cyanobacteria) can affect health and causes other water quality and environmental problems when it accumulates and forms 'blooms' in fresh water. It is currently controlled by the application of chemical treatments.

Dr Howard says ultrasound - at high amplitudes - is used for treating sewage and in other chemical processes but hasn't been practical for fresh water treatment. Ultrasound at high amplitudes breaks down the cell walls of the blue-green algae, releasing toxins into the water.

"The novel part of our solution is that we will be using ultrasound at low amplitudes where it immobilises the blue-green algae without releasing its toxins into the water and with lower energy input," Dr Howard says.

The researchers propose mounting ultrasound generators inside large underwater columns containing mixers which will draw the water through for treatment as it flows past.

The main industry partner, SA Water, has been working with University of Adelaide researchers over the past 15 years on a range of chemical and water circulation techniques in reservoirs and the River Murray to help tackle this problem.

The project has been granted $400,000 under the latest round of the Australian Research Council's (ARC) Linkage Projects scheme.

"This project is an innovative and exciting development in this area of research which has the potential to provide many benefits to drinking water supplies both locally and nationally," says SA Water Biology Research Leader Associate Professor Mike Burch.

Provided by University of Adelaide