Presence of pharmaceutical compounds in freshwater lakes and their impact on phytoplankton

*Nandakumar Kanavillil[1], Cassandra Fligg[1], Sreekumari Kurissery[1]

1. Lakehead University, Canada

Historically, microalgae have been used as bio-indicators of aquatic health and this can be seen in several studies across the world. Often, at the bottom of the food chain microalgae constitute the primary producer of energy of many freshwater ecosystems. Diatoms, a group of microalgae, have been shown to exhibit extreme sensitivity to varying environmental parameters thereby making themselves an excellent candidate for studying the impacts of pollutants such as Pharmaceuticals and Personal Care Products (PPCPs). The contamination by PPCPs is common in our inland water bodies with a potential to get into our drinking water supply. This study explores the presence of PPCPs (Ibuprofen, 17-β Estradiol, and Triclosan) in the nearshore waters of Lake Simcoe, Ontario, Canada and their impacts on microalgal community. The study involved assessment of several environmental and algal parameters in the surrounding freshwater systems of three Waste Water Treatment Plants (WWTPs) that discharge their effluents *via* a creek/water channel to Lake Simcoe. Water samples were also drawn from a control location located away from the WWTPs. The results indicated that 1) PPCPs contamination is prevalent in the water outside of WWTPs (as far as the point of confluence with Lake Simcoe), and 2) The algal parameters varied according to the presence of PPCPs in the surface waters. Thus the study supported the growing concern of pharmaceutical contamination in the freshwater systems and its impacts on primary producers.

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