

Effect of Physicochemical Parameters on biotransformation of Organic Compounds in riverine ecosystem.

**GAYATRI BASAPURAM, DR. SRIMANTI DUTTAGUPTA
AND AVISHEK DUTTA**

University of Georgia

Presenting Author: gayatri.basapuram@uga.edu

Pesticides are toxic compounds that threaten the environment and human health. Through biotransformation, the toxicity of these compounds can change and vary. Physicochemical parameters like pH, temperature, time, and concentration influence the biotransformation of pesticides, determining the transformed products. This study focuses on understanding the occurrence and fate of organic compounds and their relationship with environmental conditions and indigenous microbial communities. Temporal and spatial sampling were conducted in the North Oconee River to understand the influence of ecological conditions on pesticide biotransformation. On-site physicochemical parameter measurement suggests shifts in environmental conditions in the North Oconee River with seasons and precipitations. A non-targeted analysis using GC-MS was conducted to understand different types of organic compounds in the riverine ecosystem. Pesticides were found to be one of the most observed organic contaminants in the North Oconee River. Targeted analysis indicated that pesticide concentration varies on a temporal scale. A further investigation based on a microcosm study on one of the most abundant pesticides observed in the river water, malathion, indicated that both biological and chemical transformations are prevalent in the river water. Malathion-degrading bacteria further supported the evidence of biotransformation in the riverine ecosystem. Three potent malathion-degrading bacteria were successfully isolated from the river water. The ongoing study focuses on the changes in malathion degradation rates under different environmental conditions. In conclusion, we hypothesize that chemical and biological transformation of organic contaminants are evident in the river water, and environmental conditions play an essential role in determining the biotransformation rates.

Keywords: Pesticides, biological transformation, chemical transformation, physicochemical parameters, river water.