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The production and biotransformational changes of soluble microbial products (SMPs) and its effects on anaerobic wastewater treatment

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Zoom
Host: Dr Deepak Choudhury

Seminar Abstract

Characterization of effluents from both aerobic and anaerobic processes has shown that soluble microbial products (SMPs) produced by microorganisms in biological treatment make up a considerable proportion of the residual chemical oxygen demand (COD). The chemical compounds which enter the post-treatment, one step before its discharge into open water bodies, potentially converts to more recalcitrant compounds during the typical chlorination and UV disinfection process. Within the system, SMPs also potentially contribute to the fouling of membranes in membrane bioreactor systems.

Over the past twenty years, advancements in SMPs analysis have allowed for their chemical characterization with increasing specificity. However, these advances are still not widely applied in the study of the production of SMPs in anaerobic wastewater treatment systems, which are important in order to further improve engineering methods to reduce their concentrations in the discharge. Hence, this study aims to fill in the research gaps in the composition and occurrences of SMPs in anaerobic systems, and the trends in their formation and disappearance during anaerobic wastewater treatment; the effects of feed macronutrients on the SMPs produced and their effects on membrane fouling; and finally, evaluating SMP production in full-scale wastewater treatment plants.

About the Speaker

Prior to joining BTI, I had been with Nanyang Environment and Water Research Institute (NEWRI), working on the chemical characterization of wastewater from anaerobic treatment processes. I graduate with a PhD in May this year from the NTU Graduate College Interdisciplinary Graduate Programme (IGP) for Sustainable Earth under the support of NTU IGP Scholarship.

My research experience revolves around the analytical sciences. I obtained an MSc in Analytical Toxicology from King's College London, studying the stability of emerging new psychoactive substances in blood and plasma using HPLC and LC-MS-MS. During my final year in the undergraduate course in NTU School of Physical and Mathematical Sciences (Chemistry and Biological Chemistry), I was part of the bioanalytics group in which I focused on the development of fluorescent tags for bioimaging of bacteria and cells.

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