

Research of phosphate accumulating microorganisms from WWTPs for the recovery of phosphorus from organic wastes (3BV.3.47)



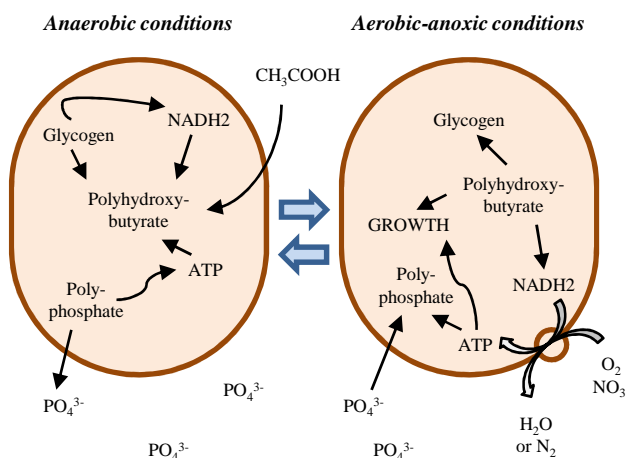
Tarayre C¹, Michels E², Buysse J², Meers E², Thonart P¹, Delvigne F¹
 1 - Bio-Industries unit - Gemblooux Agro-Bio Tech, University of Liege, Belgium
 2 - Faculty of Bioscience Engineering, Ghent University, Belgium



Introduction

Many wastes containing reusable components, such as **nitrogen, phosphorus and potassium**, are not exploited through ideal processes. As an example, in Wallonia (Belgium), the main treatment applied to sewage sludge consists in incinerating the material. Such a process is chosen when the heavy metals are too concentrated in the sludge, preventing an agricultural use. However, sewage sludge, as well as manure, slurry and digestate, contain notable amounts of nutrients (nitrogen, phosphorus and potassium). Some Waste Water Treatment Plants (WWTPs) are actually designed in order to promote Phosphate Accumulating Organisms (PAOs), able to store or release phosphorus in accordance with the environmental conditions. The aim of this work is to isolate PAOs from WWTPs and evaluate their applicability to phosphorus recovery from organic wastes. Metagenomics and metabolic properties are also considered. This work is supported by the **BioRefine Project**, a European project in which various member states focus on recovery of inorganics from organic wastestreams.

The biological phosphate removal from wastewater is achieved by a specific microflora in WWTPs

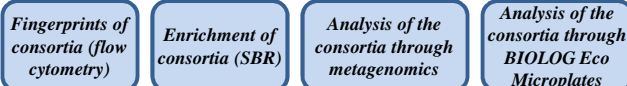


Sampling of activated sludge in 3 WWTPs achieving a 100% biological phosphate removal

In Wallonia (southern region of Belgium), there are only 3 WWTPs which achieve phosphate removal through a 100% biological pathway. Another WWTP achieving a chemical phosphate removal can be used as a negative control



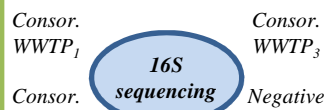
Analyses



What are the purposes of the analyses?

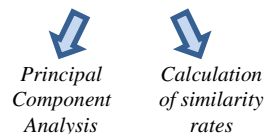
Metagenomics

Metagenomic analyses will provide data about the composition of the microflora



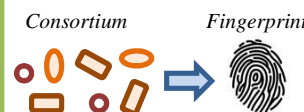
BIOLOG Eco Microplates

BIOLOG Eco Microplates will provide data about the metabolic properties



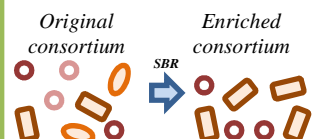
Flow cytometry

Flow cytometry can establish the profiles of consortia on the basis of fingerprints



Enrichment of consortia

Consortia can be enriched in PAOs through the use of the SBR system



The partners of the BioRefine Project



Acknowledgements

This work is supported by the BioRefine Project (INTERREG IVB NWE Programme) (ref. 320J-BIOREFINE)