

BIOREFINE Project – Screening of phosphate accumulating organisms in samples of activated sludge taken from wastewater treatment plants



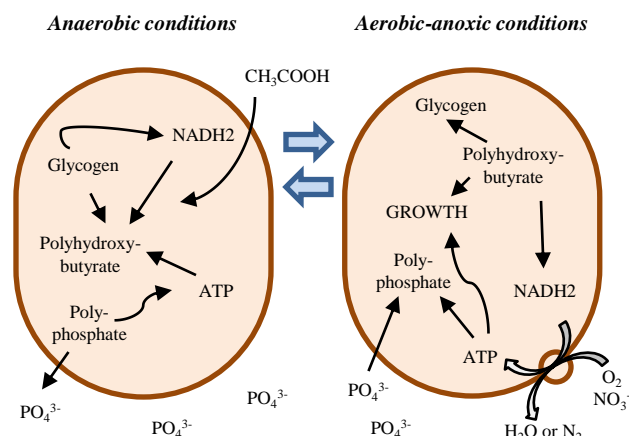
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Introduction

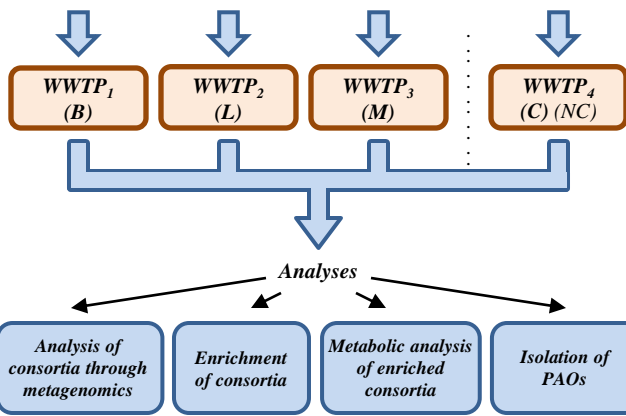
At this time, many wastes are used or eliminated through processes that do not really consider their potential applications. Such wastes contain useful nutrients (nitrogen, phosphorus and potassium) which are widely used in agriculture as fertilisers. More specifically, wastewater contains low phosphate concentrations. These concentrations considerably increase during wastewater treatment in wastewater treatment plants. Indeed, phosphate is concentrated in sewage sludge through chemical and/or biological treatment(s). Another important observation is the presence of specific bacteria which are able to accumulate phosphorus in wastewater treatment plants. These microorganisms, called “Phosphate Accumulating Organisms” (PAOs), can store phosphorus under the form of linear polymers of polyphosphate. Here, our aim was to study the microbiotas in four samples of activated sludge and to point out the presence of PAOs, which was confirmed by a metagenetic analysis. Enriched cultures were obtained from the different samples, and the metabolic activities of these artificial consortia were determined. Several bacterial strains were isolated from the samples and their potential ability to accumulate phosphorus was investigated. The positive strains were found to belong to the genera *Pseudomonas*, *Acinetobacter* and *Corynebacterium*. Finally, electron microscopy confirmed the presence of polyphosphate granules inside the cells. This work is supported by the **BioRefine Project**, a European project in which several member states focus on recovery of inorganics from organic waste streams. We gratefully acknowledge the **INTERREG IVB NWE** programme, through the BioRefine research grant (ref. 320J-BIOREFINE).

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

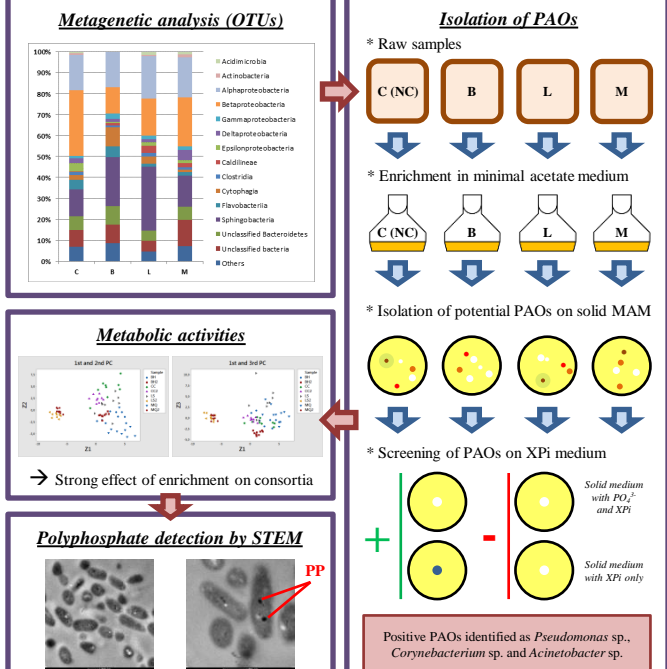


Sampling of activated sludge in 3 WWTPs achieving a 100% biological phosphate removal

In Wallonia, there are only 3 WWTPs which achieve phosphate removal through a 100% biological pathway!



Results



The partners of the BioRefine Project



Acknowledgements

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