

Selection and enrichment of denitrifying phosphorus accumulating organisms in activated sludge

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ABSTRACT

Activated sludge from a local non-biological nutrient removal wastewater treatment plant was inoculated into a sequencing batch reactor (SBR) to investigate the techniques and required conditions for the selection and enrichment of denitrifying phosphorus accumulating organisms (DNPAOs). The SBR was operated under varying anaerobic, anoxic and aerobic conditions for 3 months. In this study, it was demonstrated that enhanced biological phosphorus removal (EBPR) was established rapidly by the application of the anaerobic/aerobic (A/O) process and the selection of DNPAOs was achieved by introducing an anoxic phase. With an extension of the anoxic period and increasing nitrate dosage, the community shift between aerobic phosphorus accumulating organisms (PAOs) and DNPAOs was observed. An approximate 60% DNPAO fraction was obtained from this experiment.

Keywords: Biological phosphorus removal; Denitrifying phosphorus accumulating organisms; Anoxic phosphate uptake; Microbial selection; Microbial enrichment

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