

### Biological nutrient removal: The effect of organic load

Tea Širac<sup>1</sup>, Ana Mikulin<sup>1</sup>, Ana Špehar<sup>2</sup> and Tibela Landeka Dragičević<sup>1</sup>

<sup>1</sup>University of Zagreb, Croatia

<sup>2</sup>Agroproteinka, Croatia

Biological Nutrient Removal (BNR) of nitrogen and phosphorus has been widely used in wastewater treatment practice to control eutrophication in receiving water bodies. The most widely used nitrogen removal methods are biological nitrification (aerobic transformation of  $\text{NH}_4\text{-N}$  to  $\text{NO}_2\text{-N}$  and  $\text{NO}_3\text{-N}$ ), and denitrification methods (anoxic reduction of  $\text{NO}_3\text{-N}$  to  $\text{N}_2$ ). Simultaneous nitrification-denitrification process (SND), in compare to conventional biological nitrogen removal process, can offer several advantages including reducing carbon source and alkalinity consumption, low energy consumption, high nutrients removal efficiencies, and simplifying the treatment system. P removal is achieved through Enhanced Biological Phosphorus Removal (EBPR) under alternating anaerobic-aerobic conditions. Biological nutrient removal (N and P) in batch anoxic experiments was investigated. The initial concentration of P and N were 10-18 mg  $\text{PO}_4\text{-P/L}$  and  $48\pm 2$  mg  $\text{NH}_4\text{-N/L}$ . Sodium acetate was used as carbon source, at C/N 1 to C/N 7. Results indicated that the increase of C/N ratio improved efficiency of N removal in a range from 14.3 % at C/N 1 to 89,7 % at C/N 7. And also, the highest P removal of 61% was achieved at C/N 4. Nutrient removal was achieved by simultaneous nitrification and denitrification, and phosphorus removal.

### Biography

Tea Širac graduated from Faculty of Food Technology and Biotechnology at the University of Zagreb in 2016. She is a Master of Molecular Biotechnology. From 2017, she has been working at Faculty of Food Technology and Biotechnology as a Scientific Assistant in a Laboratory for the Biological Wastewater Treatment. Tea has been participant at IWA MEWE 2016 in the field of Microbial ecology in aerobic granular sludge processes, and at 16th Ružička days within the topic: Environmental Protection.

tsirac@pbf.hr

### Notes: