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Osijek, Croatia

BOOK OF ABSTRACTS



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REUSE OF MUNICIPAL WASTEWATER FOR AGRICULTURAL IRRIGATION BY MEMBRANE PROCESSES

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Climate change and population growth associated with increased need for food have become global problems in the supply of water for agricultural purposes. Nowadays, when all water supplies have to be considered, municipal wastewater (MWW) become valuable source of water. For a safe reuse, treated MWW should comply with the quality criteria defined by the guidelines for water use in irrigation (World Health Organization (WHO), European Union (EU)). The aim of this work was to evaluate MWW treated with membrane bioreactor (MBR), nanofiltration (NF), and reverse osmosis (RO) for its reuse in agricultural irrigation. The reclaimed MWW was characterized for the main physico-chemical and microbiological parameters. An additional focus was the detection and removal of compounds from the Watch List of contaminants of emerging concern (CEC). MBR effluent demonstrated a stable and suitable quality with regards to the decrease of turbidity (99.8%), total suspended solids (TSS, 100%), chemical oxygen demand (COD, 96%), and removal of dissolved organic carbon (DOC, 88%), but low decrease of conductivity (10%). Additional treatment with NF/RO significantly decreased conductivity and concentration of ions in permeate streams. MBR-NF/RO system completely removed all detected CECs. This study showed that MWW treated with coupled membrane processes could be helpful for production of water which satisfies all standards for agricultural irrigation.

Keywords: municipal wastewater, reuse, irrigation, membrane processes