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QUALITATIVE CHARACTERIZATION OF HOUSEHOLD GREYWATER IN THE NORTHERN GREAT PLAIN REGION OF HUNGARY

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Abstract

Greywater (GW) has attracted global attention as an alternative water source over the last few decades. GW treatment and reliable reuse require the overall qualitative characterization of samples from different sources. This paper represents an investigation of household-generated GW in the Northern Great Plain Region of Hungary. Modern and reliable analytical techniques and instruments (ion chromatography, microwave plasma atomic emission spectrometry, Zetasizer Nano Z analysis, etc.) were applied for the determination of the main pollutants and the preparation and specification of the potential treatment methods for indoor or outdoor GW reuse. It was shown that the shower/bathtub fraction must be collected separately from other sources based on its low organic matter ($\text{DOC} < 87.76 \text{ mg L}^{-1}$ and $\text{BOD}_5 < 250.33 \text{ mg L}^{-1}$, $\text{MBAS} < 2.92 \text{ mg L}^{-1}$), solids ($\text{TS} < 804 \text{ mg L}^{-1}$), salt ($\text{EC} < 610 \mu\text{S cm}^{-1}$), nutrients ($\text{NO}_3\text{-N} < 1.15 \text{ mg L}^{-1}$, $\text{NH}_4\text{-N} < 4.80 \text{ mg L}^{-1}$) and microelement ($\text{Fe} < 0.01 \text{ mg L}^{-1}$, $\text{Zn} < 0.01 \text{ mg L}^{-1}$, $\text{Cu} < 0.15 \text{ mg L}^{-1}$, $\text{Ba} < 0.38 \text{ mg L}^{-1}$) concentrations. In particular, laundry and kitchen sink or dishwasher GW were the most loaded streams. The current study demonstrated that there are no significant limitations for implementing GW reuse systems in Hungarian households but that treatment is necessary before reuse. Further research is needed to adapt treatment methods for the specifics of Hungary.

Key words: greywater, ion chromatography, microelements, reuse, zeta potential

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