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LE SCIENZE AGRARIE NELL'ANTROPOCENE:
DALLA PRODUTTIVITÀ ALLA TUTELA
DEL PATRIMONIO MATERIALE E CULTURALE

BOOK OF ABSTRACTS

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Influence of Mint and Rose extraction method on in vitro rumen fermentations

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Abstract

During the production of essential oils, in the cosmetics industry, a large amount of solid waste is produced; these residues constitute a disposal problem for industries, both in an economic and environmental context.

Due to the high content of bioactive compounds, this waste can be used, from a circular economy perspective, as supplements in dairy cows' diet. The aim of this study was to evaluate the impact of essential oil extraction method on the rumen microbiota, during in vitro rumen fermentation of *Mentha piperita* and *Rosa centifolia* L. mill., used as residual product obtained from a supercritical CO₂ extraction (Mint), and as a residue of glycol extraction (Rose). Each fermentation was tested in 3 repeated incubations, and every incubation was carried on using 50 mL of rumen fluids, collected from 3 different dairy cows, mixed with 100 mL of medium and supplemented with 1 g of different matrix. As controls, one bottle per each cow was fermented with medium and rumen fluid (blank), one with grass hay (control test) and one with grass hay and glycol (negative control). For each of the two plants were tested dry forage, residual product and residual of extraction plus the extract. Each bottle was fermented for 24 hours. After this a sample was taken and used for bacterial DNA extraction with a commercial kit and sequenced by Illumina NGS methodology. After the rumen fermentations with Mint, a significant increase, about 20%, in *Lachnospiraceae* in particular *Clostridia*, was highlighted. By converse, all the samples collected from the bottles containing glycol showed a significant increase in *Anaerovibrio* taxa, about 40%. An increase in *Butyrivibrio* was also found in all samples compared to the rumen-only control.

This study allowed us to obtain preliminary results on the potential use of waste resulting from the extraction of essential oils.

Keywords

circular economy, dairy cows, in vitro, rumen fermentation