



EFFECT OF SOLID LIPID NANOPARTICLES LOADED WITH ROSMARINIC ACID ON INTESTINAL MICROBIOTA METABOLISM

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Solid lipid nanoparticles (SLN) produced with Witepsol and Carnauba waxes and loaded with rosmarinic acid (RA) were produced elsewhere (Campos et al., 2014; Madureira et al., 2015). These nanoparticles are bioactive owing to the antioxidant and anti-inflammatory activity of RA, a polyphenol which can be found in medicinal herbs (Petersen & Simmonds, 2003) and several plant byproducts. The use of these SLN as functional food ingredients was envisaged. Hence, their effect on human intestinal microbiota composition and metabolic activity is here explored, by fermentation studies using faecal samples obtained from healthy human donors. Preparation of faecal inocula, nutrient base medium composition and fermentation conditions (FI) were according to Gullón et al. (2014). Dried empty Witepsol and Carnauba SLN, Witepsol and Carnauba SLN loaded with RA (0.15 mg/mL) and free RA were added to achieve a final concentration of 5 g SLN powder/L. Anaerobic conditions were maintained during all the process and samples were collected at 24 and 48 h of fermentation. Samples were centrifuged at 13.200 rpm for 10 min. Short Chain Fatty Acids (SCFA) concentrations were determined in the supernatants with high performance liquid chromatography (HPLC). The pellets were used for DNA microbiota extraction and PCR sequencing assays. Carnauba SLN loaded with RA significantly enriched *Lactobacillus* and *Bifidobacterium* groups. A decrease was observed in the Firmicutes group, which is positive owing to the relationship between this group and increment in body fat contents. No changes were observed in the *Clostridium leptum* group, independently on the loaded SLN type. The loaded SLNs led to increased SCFA concentrations over time (48 h), in comparison to control and free RA. Lactic and formic acid contents increased in all samples, which are related with the increment of *Lactobacillus* and *Bifidobacterium* groups. SLN loaded with RA showed to have positive effects on intestinal microbiota composition and on their metabolic activity.

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