

Evaluation of the prebiotic effects of new natural extracts on beneficial bacteria associated with human health

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The present work originates from a collaboration with a private company specialized in the identification and development of innovative raw materials and active ingredients of botanical origin. The aim of the project is to investigate the prebiotic effect of different natural extracts obtained from agro-industrial wastes and products already present on the market as food and dietary supplements. During this project three different *Bifidobacterium* and five different *Lactobacillus* strains have been used, which were previously characterized for their resistance to acidic pHs, mimicking the gut environment; antibiotic susceptibility; antimicrobial activity against common pathogens; production of B8, B9 and B12 vitamins; modulation of inflammatory response in human intestinal cell lines.

Firstly, solubilization assays have been carried out on the extracts in order to define which method would improve their fermentability.

Characterization of some of the extracts, namely the ones deriving from fungi (*Grifola frondosa* and *Ganoderma lucidum*) and vegetables (*Cynara scolymus*, *Cinnamomum zeylamicum*, *Zea mays* L.), has also been done with regard of their chemical contents such as fructans, free sugars, glucans, polyphenols and proteins.

Then, bacterial growth of the probiotic strains was evaluated in presence of some of the extracts as sole carbon and energy sources at the concentration of 1% w/v through both measurement of optical density at 600nm and counting of CFU ml⁻¹.

These growth assays were performed in anaerobic conditions after 48 hours of incubation at 37°C.

Preliminary results show that *Grifola frondosa*, which was discovered to be rich in β -glucans, seems to be the most promising prebiotic. Other extracts have a potential as prebiotics as well, although their prebiotic activity could be improved. In order to exploit these extracts in the nutraceutical field, further characterization and a metabolic screening will be carried out to single out by-products which possibly stimulate the beneficial bacteria, leading to health benefits to the human host.