

Evaluation of the prebiotic effects of natural extracts on bacteria associated with human health for their addition in functional foods

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The present work is included in the Food Social Sensor Network (FoodNET) project, in collaboration with several groups of the department and private companies. This project aims to build a platform to generate guidelines and technologies to realize efficient and accessible functional foods for the over 65 population, in order to improve their quality of life. The nutritional necessities of the selected targets are evaluated by sociological, historical, psychological and medical profiles.

In particular, the present work aims to analyse the prebiotic effects of vegetables and fungal extracts, deriving from agroindustrial wastes and products already present on the market as food and dietary supplements, testing them on selected probiotics.

The extracts used in this work derived from fungi used in typical chinese cuisine (*Grifola frondosa* and *Ganoderma lucidum*) and vegetables (*Cynara scolymus*, *Cinnamomum zeylamicum*, *Zea mays* L.).

The extracts have been characterized for their chemical contents such as fructans, free sugars, glucans, polyphenols and proteins, and different safe hydroalcoholic extraction methods have been developed. Their prebiotic effect has been evaluated by growth assay method, testing the extracts as sole carbon and energy sources (at the concentration of 2% in order to sustain the bacterial growth), in presence of the following probiotic strains: *Lactobacillus fermentum*, *Lactobacillus plantarum*, *Lactobacillus acidophilus*, *Lactobacillus reuteri*, *Lactobacillus rhamnosus*, *Bifidobacterium lactis*, *Bifidobacterium longum*, *Bifidobacterium infantis*.

The growth assays were performed testing the bacterial growth in anaerobic conditions after 48 hours of incubation at 37°C.

Preliminary results revealed the efficiency of all the tested natural extracts as prebiotics indeed the examined probiotics, both *Lactobacillus* and *Bifidobacterium* strains, were able to efficiently utilize the extracts as sole carbon and energy source.

Therefore, these results unveiled the possibility to produce functional foods containing the studied extracts to promote a positive effect on the stimulation of gut microbiota growth, improving the health of the target final customers.

