

Tannin Encapsulation for Personalized Product Applications [†]

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Abstract: Tannins are the secondary metabolites of plants, and are polymers consisting mainly of glycosides, found in nature as hydrolysable tannins or condensed tannins, as well as a combination of them. In the European Horizon 2020-funded Stance4Health project, one of the objectives is to develop special tannin extracts (from chestnut wood, quebracho wood, oak wood, tara pods, Chinese gallnuts) with differential effects on the gut microbiota and human health, aiming for a personalized modulation of gut microbiota activity at the individual level.

Keywords: tannins; personalization; supplement; athletes; elderly

1. Introduction

The Stance4Health EU Project addresses topic DT-SFS-14-2018: Personalised Nutrition, belonging to the Work Programme 2018–2020 of “Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy”. The specific challenge of this topic is to tackle some of society’s grand challenges like the development of new, secure and healthier foods while fighting against 21st century non-communicable diseases (NCDs) [1–3].

One of the objectives is to develop special tannin extracts (from chestnut wood, quebracho wood, oak wood, tara pods, Chinese gallnuts) with differential effects on the gut microbiota and human health, aiming for a personalized modulation of gut microbiota activity at the individual level [3,4].

2. Materials and Methods

The tannins (from chestnut wood, quebracho wood, oak wood, tara pods, Chinese gallnuts) will be extracted by means of water, ethanol or water–ethanol mixtures at different ratios [5,6].

Due to their astringency and bitter flavor, the bitterness will need to be modified by coating the bitter-tasting tannins extracted using alginate or gum-like formulas, or a combination of maltodextrin and gum Arabic (ratio of 40:60 (*w/w*)) to enable double-phase emulsion micro-encapsulation or using the spray-dry method to obtain hydroxypropylmethylcellulose (HPMC) particles with tannins [7].

3. Results and Discussions

The final product targeted is a powder form that can be easily re-dispersed in water for personalization at an individual level [8–13].

Moreover, the antioxidant, antimicrobial (increase the shelf-life of foods) and antibacterial (inhibitor to foodborne bacteria) effects of tannins are well known; therefore, their applications as food enhancements and food preservatives are of great importance due to their protective nature.

4. Conclusions

Novel dietary supplements enriched with different tannin extracts in order to exert novel biological activities will be produced in an individualized manner, being the first step in the European Food Sector for personalized nutrition.

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Conflicts of Interest: The authors declare no conflict of interest.

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