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Spray Drying and Physico-Chemical Microbiological Evaluation of Ethanolic Extracts of Propolis

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Abstract : The propolis are substances obtained from the beehive have an action against pathogens, prooxidant substances and free radicals because of its polyphenols content, this has motivated the use of these compounds in the food and pharmaceutical industries. However, due to their organoleptic properties and their ability to react with other compounds, their application has been limited; therefore, the objective of this research was to propose a mechanism to protect propolis and mitigate side effects granted by its components. To achieve the stated purpose ethanolic extracts of propolis (EEP) from three samples from Santander were obtained and their antioxidant and antimicrobial activity were evaluated in order to choose the extract with the biggest potential. Subsequently mixtures of the extract with maltodextrin were prepared by spray drying varying concentration and temperature, finally the yield, the physicochemical, and antioxidant properties of the products were measured. It was concluded that Socorro propolis was the best for the production of microencapsulated due to their activity against pathogenic strains, for its large percentage of DPPH radical inactivation and for its high phenolic content. In spray drying, the concentration of bioactive had a greater impact than temperature and the conditions set allowed a good performance and the production of particles with high antioxidant potential and little chance of proliferation of microorganisms. Also, it was concluded that the best conditions that allowed us to obtain the best particles were obtained after drying a mixture 1:2 (EEP: Maltodextrin), besides the concentration is the most important variable in the spray drying process, at the end we obtained particles of different sizes and shape and the uniformity of the surface depend on the temperature. After watching the previously mentioned microparticles by scanning electron microscopy (SEM) it was concluded that most of the particles produced during the spray dry process had a spherical shape and presented agglomerations due to the moisture content of the ethanolic extracts of propolis (EEP), the morphology of the microparticles contributed to the stability of the final product and reduce the loss of total phenolic content.

Keywords : spray drying, propolis, maltodextrin, encapsulation, scanning electron microscopy
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