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Physicochemical properties and antioxidant capacity of oak (*Quercus resinosa*) leaf infusions encapsulated by spray-drying

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ABSTRACT

The effect of two wall materials and two feed flow rates on the physical and antioxidant properties of *Quercus resinosa* leaf infusion microencapsulated by spray-drying is reported. Dispersions with lyophilized *Q. resinosa* infusion and wall material (k-carrageenan and maltodextrin [10 DE]) were prepared. Samples were fed at rate flows of 1.6 and 1.7 L/h. Encapsulation yield, total phenolic content, DPPH test, deoxy-D-ribose assay, rheological and SEM evaluations were made. The highest yield and DPPH scavenging activity were obtained at 100% maltodextrin and 1.7 L/h. Higher polyphenolic retention was observed in blends of carrageenan/maltodextrin (1.6 and 1.7 L/h) and maltodextrin (1.6 L/h). The highest inhibition of deoxy-D-ribose oxidation was found at blends of carrageenan/maltodextrin (1.7 L/h). Dispersions showed pseudoplastic behavior and properties as liquid-like materials. Microcapsules showed particle sizes between 5 and 35 μm . The best condition for encapsulation of *Q. resinosa* infusions was suggested as 100% maltodextrin at 1.7 L/h.

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1. Introduction

Quercus resinosa is a deciduous tree belonging to the family *Fagaceae* and is found in the mixed pine-oak forests in Northern Mexico. The bark, leaf and galls have been studied by several researchers in function of their antioxidant capacity (Rivas-Arreola et al., 2011; Rocha-Guzman et al., 2009).

Rocha-Guzman et al. (2012) identified several polyphenol compounds in *Q. resinosa* infusions by HPLC including gallic acid, syringic acid, epigallocatechin gallate. Based in the scientific evidence, it is clear that *Q. resinosa* infusions have antioxidant properties related with its phenolic content.

Unfortunately, phenolic compounds are influenced by several factors as oxygen, temperature and processing. Moreover, the antioxidant capacity could be affected with

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