

Polyphenol Stability and Antioxidant Properties of Freeze-Dried Sour Cherry Encapsulates

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Abstract : Despite the recommended amount of daily intake of fruits, the consumption in modern age remains very low. Therefore there is a need for delivering valuable phytochemicals into the human body through different foods by developing functional food products fortified with natural bioactive compounds from plant sources. Recently, a growing interest rises in exploiting the fruit and vegetable by-products as sources of phytochemicals such as polyphenols, carotenoids, vitamins etc. Cherry contain high amounts of polyphenols, which are known to display a wide range of biological activities like antioxidant, anti-inflammatory, antimicrobial or anti-carcinogenic activities, improvement of vision, induction of apoptosis and neuroprotective effects. Also, cherry pomace, a by-product in juice processing, can also be promising source of phenolic compounds. However, the application of polyphenols as food additives is limited because after extraction these compounds are susceptible to degradation. Microencapsulation is one of the alternative approaches to protect bioactive compounds from degradation during processing and storage. Freeze-drying is one of the most used microencapsulation methods for the protection of thermosensitive and unstable molecules. In this study sour cherry pomace was extracted with food-grade solvent (50% ethanol) to be suitable for application in products for human use. Extracted polyphenols have been concentrated and stabilized on whey (WP) and soy (SP) proteins. Encapsulation efficiency in SP was higher (94.90%), however not significantly ($p < 0.05$) from the one in WP (90.10%). Storage properties of WP and SP encapsulate in terms of total polyphenols, anthocyanins and antioxidant activity was tested for 6 weeks. It was found that the retention of polyphenols after 6 weeks in WP and SP (67.33 and 69.30%, respectively) was similar. The content of anthocyanins has increased in WP (for 47.97%), while their content in SP has very slightly decreased (for 1.45%) after 6-week storage period. In accordance with anthocyanins the decrease in antioxidant activity in WP (87.78%) was higher than in SP (43.02%). According to the results obtained in this study, the technique reported herewith can be used for obtaining quality encapsulates for their further use as functional food additives, and, on the other hand, for fruit waste valorization.

Keywords : cherry pomace, microencapsulation, polyphenols, storage

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