

Preparation of cinnamon oil microcapsules to be used as a digestive supplement for humans

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Cinnamon oil is important in treating various disease conditions including digestive problems. However, direct usage of cinnamon oil could cause skin irritations and allergic reactions. Oral administration of cinnamon oil can increase the heart rate, gastric motility and respiration. Therefore, microencapsulation technique was tested as a way to overcome these limitations and to improve the utility of cinnamon oil. Cinnamon oil was encapsulated by the complex coacervation method using chitosan and gum arabic wall materials. These microcapsules appeared to be irregular in the optical and scanning electron microscopic images. UV-visible analysis confirmed the effective encapsulation of cinnamon oil with a loading of 860 µg/g. The prepared microcapsules displayed a 47 ± 1 % and 32 ± 1 % release of the core oil in pH 2 and pH 7 solutions that mimicked the stomach and intestine conditions respectively. This indicated the controlled release of about 79% encapsulated cinnamon oil from the microcapsules under conditions similar to the gastrointestinal tract. The brine shrimp lethality assay indicated that the cytotoxic effects of cinnamon oil are notably masked in the intact microcapsules. Those data also demonstrated the ability of microencapsulated cinnamon oil to be released with time. Furthermore, the encapsulated oil exhibited considerable antioxidant activity and the microcapsules did not possess any strong odor as the unencapsulated oil. These results indicate that microencapsulation can be used to improve the utility of cinnamon oil as a digestive supplement.

Keywords: *Microencapsulation, Cinnamon oil, Folin-Ciocalteu assay, Controlled release, Antioxidant activity.*

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