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The Combination of Porcine Plasma Protein and Maltodextrin as Wall Materials on Microencapsulated Turmeric Oil Powder Quality

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Abstract : Turmeric is a natural plant herb and generally extracted as essential oil and widely used in food, cosmetic, pharmaceutical products including insect repellent. However, turmeric oil is a volatile essential oil which is easy to be lost during storage or exposure to light. Therefore, biopolymers such as protein and polysaccharide can be used as wall materials to encapsulate the essential oil which will solve this drawback. Approximately 60% plasma from porcine blood contains 6-7% of protein content mainly albumin and globulin which can be a good source of animal protein at the low-cost biopolymer from by-product. Microencapsulation is a useful technique to entrap volatile compounds in the biopolymer matrix and protect them to degrade. The objective of this research was to investigate the different ratios of two biopolymers (PPP and maltodextrin; MD) as wall materials at 100:0, 75:25, 50:50, 25:75 and 0:100 at a fixed ratio of wall material: core material (turmeric oil) at 3:1 (oil in water) on the qualities of microencapsulated powder using freeze drying. It was found that the combination of PPP and MD showed higher solubility of microencapsules compared to the use of PPP alone ($P < 0.05$). Moreover, the different ratios of wall materials also affected on color (L*, a* and b*) of microencapsulated powder. Morphology of microencapsulated powder using a scanning electron microscope showed holes on the surface reflecting on free oil content and encapsulation efficiency of microencapsules. At least 50% of MD was needed to increase encapsulation efficiency of microencapsulates rather than using only PPP as the wall material ($P < 0.05$). Microencapsulated turmeric oil powder can be useful as food additives to improve food texture, as a biopolymer material for edible film and coating to maintain quality of food products.

Keywords : microencapsulation, turmeric oil, porcine plasma protein, maltodextrin
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