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FORMULATION AND CHARACTERIZATION OF MICRO/ NANODISPERSIONS ENCAPSULATING FUNCTIONAL FOOD COMPONENTS

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Functional foods have been growing rapidly in food industry. The important key of their application is to deliver functional compounds to the target in the human body. Colloidal delivery systems have been widely used in foods, pharmaceuticals and cosmetics. The primary aim of this work was to formulate micro/nanoemulsions containing baicalein and lemongrass oil which are the local products from agriculture in Thailand. Baicalein possesses multiple medicinal activities like anti-circulatory failure, anti-cancer, anti-HIV, and antioxidant, while lemongrass oil has shown a reduction of spasmodic affection and gastric irritability as well as its characteristic scent. The baicalein-loaded oil-in-water (O/W) emulsions were successfully formulated using a high-pressure homogenization method. Our results demonstrated that O/W emulsions encapsulating baicalein with a Sauter mean diameter ($d_{3,2}$) as small as 300 nm were obtained. Their $d_{3,2}$ value decreased with increasing homogenization pressure from 20 MPa to 150 MPa. Physical stability in terms of the variation of the $d_{3,2}$ value remains unchanged during 30 days of storage. Chemical stability of baicalein during storage was also investigated by HPLC. Microchannel (MC) emulsification was performed to prepare lemongrass oil-in-water emulsions. Uniformly sized lemongrass oil droplets with a number-average droplet diameter of 23 μ m and a coefficient of variation of <4% were stably generated from hydrophilically treated silicon MC arrays. Mixtures of lemongrass oil and vegetable oil at different weight ratios were also successfully used for preparing monodisperse O/W emulsions.