

Abstract

Curcumin is herb that used as natural colorant in pickled green mustard to improve the product's color. Unfortunately, the yellow color of curcumin is not stable in the product due to its photodegradation. Therefore, this research was aimed to study the encapsulation of curcumin crude extract by using hydroxypropyl- β -cyclodextrin and kneading method to improve its color stability as well as its application in pickled green mustard as the natural colorant. Curcumin powder was extracted by using the mixture of ethanol and water with the ratio of ethanol to water as 100:0, 75:25, and 50:50 for 1.5 h. The ratio of ethanol to water as 75:25 provided the highest curcumin content as 62.98%. Then the curcumin crude extract was encapsulated by using HP- β -CD and kneading method with the molecular ratio of curcumin crude extract to HP- β -CD as 1:1, 1:1.5, and 1:2 with the kneading time of 5, 10, 15, and 20 min. The mixture was then dried at 40°C for overnight and then ground into powder. Some properties of encapsulated curcumin powder, such as color release and powder stability, were investigated as well as encapsulation efficiency (EE) and encapsulation yield (EY). The molecular ratio of 1:2 gave the highest EE and EY as 99.26 and 41.08%, respectively. Moreover, the curcumin was retained on the encapsulated powder as 54% under shaking condition for 20 min. Thermal degradation of encapsulated powder was found to be zero-order with R^2 of 0.901, while photodegradation was found to be the first-order with R^2 of 0.964. The color of encapsulated curcumin powder was pH dependence. In addition, the encapsulated curcumin powder was applied as colorant in pickled green mustard and then kept at 55°C for 30 days as accelerated storage condition. Although, there was no significant difference ($p>0.05$) in color due to lower dosage used for microencapsulated powder, pickled green mustard containing encapsulated curcumin powder had better score than control in flavor, texture, and overall liking throughout the storage with product acceptance as 68.89% at the end of accelerated storage test, which was equal to 6 months.