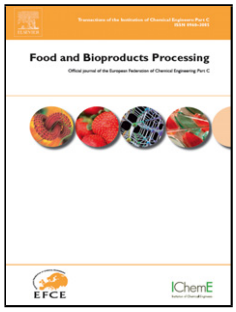

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Novel cress seed mucilage and sodium caseinate microparticles for encapsulation of curcumin: An approach for controlled release

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highlights

- CSM/sodium caseinate micro-particles loaded with curcumin were prepared.
- Effects of biopolymer concentration and initial amount of curcumin were studied.
- Release profile for the freeze-dried sample was faster than the spray dried microcapsules.

Abstract

In this research application of cress seed mucilage (CSM) as a new source of hydrocolloid, and sodium caseinate for encapsulation of curcumin (CUR) was investigated by complex coacervation using spray and freeze drying methods. The effects of pH and CSM/caseinate volume ratio on coacervation yield were evaluated. The produced microcapsules were analyzed by encapsulation efficiency and load, morphology, FTIR and release kinetics. Turbidity measurements and coacervation yield data showed that at pH 4.0 and CSM/caseinate volume ratio of 1:2, the maximum interactions between biopolymers were occurred. FTIR analysis demonstrated that under isoelectric pH of sodium caseinate due to presence of oppositely charged groups, electrostatic interactions between biopolymers might take place. SEM images showed that freeze-dried microcapsules had an irregular network with porous structure while spray-dried microcapsules possessed spherical shape. Release behavior of CUR was investigated in simulated gastric and intestinal fluids and mathematically modeled. The main release mechanisms of CUR were considered as Fickian diffusion and case-II transport in gastric and intestinal fluids, respectively. Finally,