

Factors influencing forward extraction of jacalin from aqueous phase into anionic reverse micelles

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Abstract

Background: This study deals with the extraction of jacalin from crude extract of jackfruit seed using reverse micelles formed by anionic surfactant, sodium bis-2-ethyl hexyl sulphosuccinate (AOT) in isooctane. The effect of AOT concentration, NaCl concentration and aqueous phase pH on its forward extraction efficiency (FEE) was evaluated.

Methods: Forward extraction was performed by slowly stirring equal volumes of reverse micellar phase (organic phase) and aqueous phase. The organic phase was formed by anionic surfactant (AOT) and organic solvent (isooctane), while the aqueous phase was composed of dilutions of crude extract into separate buffer solutions at different pH values containing NaCl for ionic strengths adjustment. Effect of each parameter mentioned previously was studied using one factor at a time experiments (OFAT) to maximize the forward extraction efficiency of jacalin.

Results: AOT concentration, NaCl concentration and aqueous phase pH were found to have different effects on the removal of jacalin from the aqueous phase into the AOT reverse micelles. A maximum forward extraction efficiency of 78% was achieved after the mixture was stirred for 15 min using 10 mM AOT at pH 5 aqueous phase containing 0.1 M NaCl.

Conclusion: The findings demonstrated AOT reverse micellar system as a promising and effective method to extract and purify jacalin from crude protein mixture.

Keywords: Reverse micelles; AOT/isooctane; Jacalin; Forward extraction efficiency (FEE)