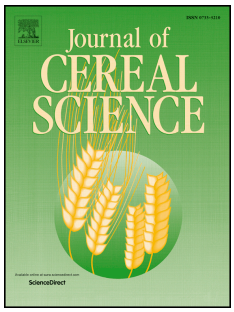

Structure characteristics of *Coix* seeds prolamins and physicochemical and mechanical properties of their films

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Structure Characteristics of *Coix* Seeds Prolamins and Physicochemical and Mechanical Properties of Their Films

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ABSTRACT: The structure characteristics of three *Coix* seed (BCS, SCS, and TCS) prolamins were studied and their pure films properties compared. The three prolamins showed different amino acid composition, and hydrophobicity, and the results of LC-MS/MS exhibited their peptide sequence differences. Their aggregates were rodlike structures, formed very a fine meshwork and had self-assembly properties, which was the basis of their film-forming, similar to zeins. The SCS and TCS prolamins showed better thermal stability than that of BCS prolamins, and their films had better water resistance, puncture, and tensile strengths than those of pure zein film. The SCS film displayed better water absorption and higher elongation than those of the TCS film. Although some properties of the films, such as flexibility and thermal stability, still need to be improved, these results have proven that *Coix* seed prolamins have potential as biodegradable films for use in the food industry.

Keywords: *Coix* seed prolamins; film; physicochemical properties; mechanical properties

1. Introduction

Coix seed is the mature kernel of *Coix lachryma-jobi L.*, and is native to southern Asia, including China, Burma, Thailand, Japan and Korea; it has also been introduced into Brazil (Ottoboni et al., 1990). It has long been used as a traditional Chinese medicinal herb and food source. There are many types of biologically active components in *Coix* seed, which make it have many pharmacological and physiological effects, including antitumor (Lu et al., 2011), anti-inflammatory (Chen et al., 2011), and antiallergic (Chen et al., 2010). These biologically active substances mainly are *Coix* seed oil components and oligosaccharides, so *Coix* seed protein is discarded and not given much attention in research studies and applications of *Coix* seed; thus,

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