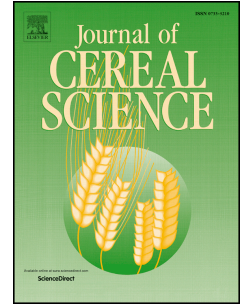


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Structure characteristics of *Coix* seeds prolamins and physicochemical and mechanical properties of their films

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1 **Structure Characteristics of *Coix* Seeds Prolamins and** 2 **Physicochemical and Mechanical Properties of Their Films**

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

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

20 **1. Introduction**

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

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