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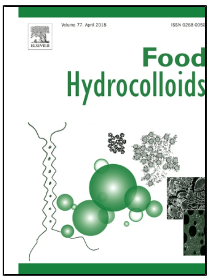

Hempseed meal protein isolates prepared by different isolation techniques. Part II. Gelation properties at different ionic strengths

Tamara Dapčević Hadnađev, Miroslav Hadnađev, Athina Lazaridou, Thomas Moschakis, Costas G. Biliaderis

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Hempseed meal protein isolates prepared by different isolation techniques. Part II. Gelation properties at different ionic strengths

Tamara Dapčević Hadnađev[1*], Miroslav Hadnađev[1], Athina Lazaridou[2], Thomas Moschakis[2], Costas G. Biliaderis[2]

[1]Institute of Food Technology, University of Novi Sad, Bulevar cara Lazara 1, 21000 Novi Sad, Serbia

[2]Dept. of Food Science and Technology, Aristotle University of Thessaloniki, Thessaloniki, Greece 541 24

Abstract

The effect of isolation technique and sodium chloride level (0, 50, 300 mM, at pH 7.0) on gelation of hemp protein isolates was investigated. The aqueous dispersions (30% w/w) prepared from micelle (salt extracted) protein isolate (HMI) behaved more as concentrated liquid-like dispersions, while the dispersions prepared from the alkali extracted/isoelectric precipitated protein isolate (HPI) had a paste-like consistency. Although changes in NaCl concentration did not have a pronounced impact on the rheological properties and microstructure of HPI dispersions, an increase in NaCl concentration led to HMI protein isolate aggregation. On heating, both HMI and HPI formed gels as indicated by dynamic oscillatory rheological measurements. Confocal micrographs have shown that the HPI gels had a granular, particulate structure, while the HMI gels had cellular-like structure formed from thin strands. In the case of HMI gels, 300 mM NaCI concentration caused intensive protein-protein interactions, which resulted in the formation of an aggregate structure with larger pore sizes in comparison to HMI gels prepared from low salt (50 mM NaCl) or without salt aqueous dispersions. On the contrary, NaCl addition slightly affected the HPI gels microstructure in terms of preservation of protein globular structure.

Key words: *hemp protein, alkaline extraction, micellization, gelation properties, confocal microstructure, rheological behaviour*

1 Introduction

Proteins from alternative sources such as oilseed meals, by-products after oil extraction, represent valuable low-cost food ingredients which can improve the nutritional quality of food products (El-Adawy, 1997; Pojić, Dapčević Hadnađev, Hadnađev, Rakita, & Brlek, 2015), but also provide desirable functional properties (Moure, Sineiro, Domínguez, & Parajó, 2006; Karaca, Low, & Nickerson, 2011; Yin, Tang, Wen, & Yang, 2007). It was already shown that proteins isolated from hemp seed (*Cannabis sativa L.*) meal can exert a range of functionalities,

* Corresponding author
E-mail address: tamara.dapcevic@fins.uns.ac.rs (T. Dapčević Hadnađev)