

FUNCTIONAL AND BIOLOGICAL PROPERTIES OF ISOLATED CHICKPEA (*CICER ARIETINUM* L.) SEED PROTEIN

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ABSTRACT

Proteins are essential functional components of various food products and thus determine sensory, textural and nutritive properties of food. Usage of proteins in food industry greatly depends of its functional properties such as solubility, water and oil retention capacity, gelation, emulsifying and foaming properties. Studying the functionality of food proteins is crucial with the purpose that they may be completely understood and used effectively in food products. Chickpea (*Cicer arietinum* L.) is one of the most consumed legumes around the world and an excellent source of protein. Chickpea proteins have received huge attention during recent years owing to their high biological and nutritive values and better functional properties than oilseed proteins. Furthermore, various bioactive properties of chickpea proteins have been reported, primarily antioxidant activity because these proteins possess capacity to scavenge free radicals by different mechanisms. The aim of this work was to isolate albumin, globulin and glutelin protein fractions from chickpea seeds by sequential extractions. Additionally, some functional characteristics and biological properties of isolated fractions were determined as factors which have important role in behave of this protein in food systems.

Sequential extraction of protein fractions with different solvents - water, NaCl and NaOH solutions was conducted and albumin, globulin and glutelin fractions, respectively, were obtained. In evaluation of functional properties, emulsifying and foaming, water and oil holding capacities of isolated fractions were analyzed. Obtained results showed that highest emulsifying and foaming properties were determined for glutelin fraction. This fraction exhibited 20% higher emulsifying activity compared to albumin and 70% higher than globulin. Moreover, water and oil holding capacities were significantly different among fractions, while glutelin fraction showed the highest results (2.74 g/g and 5.29 g/g, respectively). In addition, protein fractions showed variations in antioxidant activities, with albumin fraction showing superior ABTS radical scavenging activity compared to other two fractions. Results revealed that all assayed functional and biological properties of chickpea protein fractions were suitable for their application in food industry.

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