

Departmental Seminar

Seminar Title	: Return Seminar-EFFECT OF ULTRASONICATION ON EXTRACTABILITY AND CHARACTERIZATION OF PROTEIN FROM DECCAN HEMP SEEDS
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Venue	: CH 306
Date and Time	: 26 Sep 2024 (5.00 pm)
Abstract	: Background: Novel and underutilized plant sources are increasingly being researched to obtain valuable macromolecules such as proteins. Isolation of protein from such novel plant-based sources mainly depends on the extraction method. Yield, nutritional quality, techno-functional properties and structural attributes of the protein are significantly affected by the process parameters of the extraction method. In this study, ultrasound-assisted extraction process was evaluated to obtain protein from Deccan hemp seed. Methods: Protein from defatted Deccan hemp seed (DHS) flour was extracted by ultrasound-assisted alkaline method under different conditions of amplitude (35%, 55% and 75%) and time (10 min, 15 min and 20 min). The non-ultrasound alkaline extraction was considered as control. The extracted DHS protein was characterized in terms of its structural, physicochemical, and functional properties. Results: The extraction yield, protein yield and purity of DHS protein improved significantly by the ultrasound pretreatment. The ultrasound treatment of 30 min at 75% was considered as the best condition for the pretreatment of protein extraction due to the higher extraction yield, protein yield and purity of 34.76%, 97.39% and 85.15% respectively. Structural characterization including fluorescence spectroscopy, circular dichroism, FTIR spectra, SEM, zeta potential and DSC provided insight into the protein's tertiary and secondary conformations, surface characteristics and thermal properties. Flow behavior, dynamic rheology and functional properties of DHS protein were also conducted. Conclusions: The cavitation mechanism in ultrasound technique improved the DHS protein extraction. Ultrasound assisted alkaline method improved the extraction yield, purity, functional properties of DHS protein. This protein can be used as a potential ingredient for the production of functional and health promoting foods. Key words: Deccan hemp seed, Ultrasound, Structural characterization.