
Departmental Seminar

Seminar Title	: Conf. Return Seminar: EXTRACTION AND CHARACTERIZATION OF PROTEINS FROM DETOXIFIED PLUM KERNEL MEAL AND ITS APPLICATION IN ENCAPSULATION OF BIOACTIVE COMPOUNDS
Speaker	: Shalom Benny
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Venue	: CH-306
Date and Time	: 02 Jan 2025 (5.15PM)
Abstract	: Objective: To prepare and characterize plum kernel protein isolates using ultrasonication, focusing on optimizing particle size, stability, and encapsulation efficiency. Methodology: Plum kernel protein isolate (PKPI) was prepared from defatted plum kernel meal following the methodology of Shen et al. (2017). Alkaline extraction followed by acid precipitation was used to obtain the PKPI from the defatted meal. The isolated protein was then subjected to ultrasound treatment at varying durations (10, 20, 30, and 40 minutes) with constant amplitude of 50%. The treated proteins were characterized to assess their functional, physical, molecular, and structural properties. Results and Discussions: The samples treated with ultrasound for 20 minutes (US-PKPI-20) exhibited highest purity and extraction yield among all samples. Thermal analysis revealed that the control sample required the highest temperature for protein denaturation. FTIR analysis showed significant alterations in the amide A and B regions at 3274 cm ⁻¹ and 2926 cm ⁻¹ , suggesting interactions with water and lipid molecules. These interactions led to enhanced solubility, improved emulsifying properties, and increased surface hydrophobicity. Consequently, US-PKPI-20 demonstrated a higher oil-holding capacity and a decreased water-holding capacity. XRD analysis indicated an increase in crystallinity and stability, reflected in an enhanced β-sheet structure, which is advantageous for encapsulation applications due to its improved denaturation temperature. The enthalpies were also measured to further understand protein stability and potential applications.