
Departmental Seminar

Seminar Title	: Return Seminar: Extraction and Characterization of High-Quality Protein from Cassava Leaves Using Deep Eutectic Solvents: A Comparative Study with Alkaline Methods.
Speaker	: Abhipriya Patra
Supervisor	: Abhipriya Patra
Venue	: CH-306
Date and Time	: 02 Jan 2025 (4.45PM)
Abstract	: Objective: This study evaluated the potential of deep eutectic solvents (DESs) as sustainable alternatives to conventional alkaline extraction for isolating protein from cassava leaves (<i>Manihot esculenta</i>), focusing on optimizing yield, protein quality, and functional properties. Methodology: Cassava leaf protein isolate (CPI) was extracted using several three DESs—choline chloride-glycerol, choline chloride-lactic acid, and lactic acid-glycerol were chosen for efficacy of protein extraction against alkaline extraction. Protein yield, content, and recovery yield were analyzed to determine extraction efficiency of suitable DES. Lactic acid-glycerol was selected as a representative DES for further analysis of its effects on the structural and functional qualities of CPI. The amino acid composition, including essential amino acids (EAAs), was characterized, along with evaluating in vitro digestibility. Results and Discussion: Alkaline extraction achieved the highest protein extraction yield (18.31 ± 0.53 %) and content (21.83 ± 0.41 g/100 g dm, along with a recovery yield of (69 ± 1.31 %). However, lactic acid-glycerol outperformed other DESs in protein content (22.16 ± 0.36 mg/100 g dm and recovery yield (73.77 ± 1.05 %), though it had a slightly lower extraction yield (16.85 ± 0.41 %). The mild acidity of lactic acid with glycerol's stabilizing effect preserved CPI's structural and functional properties, with a favorable EAA composition (40.36%) and high hydrophilic amino acid content (60.16%). This combination also enhanced in vitro digestibility, making DES a promising sustainable alternative for CPI extraction with improved nutritional, structural and functional quality.