National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Return seminar: How mechanical pre-treatment affects the extraction yield, nutritional, structural, and functional properties of leaf proteins
Speaker	: Ram Prasad Bebartta
Supervisor	: 2910
Venue	: CH-306
Date and Time	: 23 Jul 2025 (17.00)
Abstract	: Moringa leaves, rich in functional proteins, may benefit from ball milling (BM) to enhance protein extraction and functionality through structural modification. BM for 3 h resulted in the highest protein yield (180 %) and improved digestibility. Though 5 h treatment increased the extraction yield, it reduced protein purity. The BM significantly reduced β-sheet (51.5 to 42.1 %) and increased random coil structures (23.3 to 34.4 %), suggesting protein unfolding. Except at 5 h, increasing BM duration reduced the disulfide bonds, denaturation temperature, enthalpy, surface hydrophobicity, and particle sizes of moringa leaf protein concentrate (MLPC). Similarly, solubility, water holding capacity, and foaming capacity were also significantly improved in MLPC up to 3 h of BM. Correlation analysis indicated that BM duration significantly affected the essential amino acids, carbonyl content, sulfhydryl groups, and functional properties of MLPC. Conclusively, moderate BM duration (3 h) underscores its potential as a scalable pre-treatment for producing high-quality plant protein ingredients. Keywords: Leaf proteins, Ball milling, Protein yield, Functional properties, Structural properties