National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Return Seminar: Sono-hydro Priming of Proso Millet (Panicum miliaceum) Grain- Effect on Hydration Kinetics, Phytochemical Contents, Antinutrients and Functional Properties
Speaker	: Sibasish Sahoo
Supervisor	: 2910
Venue	: CH-306
Date and Time	: 11 Nov 2024 (17.00)
Abstract	: Proso millet (PM), one among the minor millets is rich in nutrients but do possess some antinutrient content (ANC). Conventional method of hydrating grains is quite time taking. PM was subjected to ultrasonication (40 kHz) to accelerate the process of hydration and to check its hydration behaviour. Along with hydration kinetics, the effect of operating parameters viz. amplitude (30-70%) and treatment period (10-30 min) on bioactive compounds viz. TPC, TFC, DPPH radical scavenging activity and FRAP, on antinutrients such as, tannin, saponin, and phytic acid along with functional properties such as WAC, OAC and WSI were investigated. US treatment was found to be effective on accelerating the hydration rate of millet. The etching occurred on the seed coat due to the free radicals formed during cavitation, led to increased surface roughness and decrease in water contact angle, which ultimately aided in increasing imbibition rate. Both US amplitude and time were found to play significant role in increasing FRAP and decreasing antinutrient content. US application affected the starch composition, by decreasing amylose content (AC), which was evidenced through XRD as well with increased crystallinity. Decreased AC is supposed to be the reason behind decreased OAC, due to more amylose lipid and amylose complex formation. US amplitude was found to be more effective in reducing the starch sizes, as witnessed through the SEM images, thereby increasing WSI. The US assisted hydration kinetic model observed were fitted well to a large extent through Peleg, Weibull, Page and Lewis models.