National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Return Seminar-Exploring dry-heat treated flours from Kodo millet for potentially slow-digestible breakfast cereal development
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Venue	: CH-306
Date and Time	: 30 Oct 2024 (17.00)
Abstract	: Kodo millet or cow grass, indigenous to Indian soil around 3,000 years ago, well-suited to thrive under abiotic stress and scanty rainfall, possesses the goodness of iron and low glycaemic index. Natively, its low amylose content hinders the manufacturing of breakfast cereals recording meagre expansion, an unacceptable product attribute. A green-and-clean label technology of dry-heat treatment (DHT) contributing chemical-free modification method on hulled Kodo flour within restricted moisture (15–20%) and heat prolongation (2–4 h) at 130 °C was evaluated on its physicochemical properties. In our study, the impact of DHT on flour quality, enhanced amylose content (11.44%), bulk density (22.90%), A-type relative crystallinity (20.62%), and granule size (13.01%) relative to untreated flour. Techno-functional properties (amylose leaching, water-and-oil absorption capacities, solubility index, and swelling power) exhibited a significant ($p<0.05$) decrease. DHT20-4h, exhibited higher amylose content (28.83%), was blended for breakfast-cereal (coded as BC-DHT) production with whole-maize flour. Upon twin-screw extrusion, this generated more amorphous sites of B-type polymorph, with higher crispiness count (64.42%), sectional-expansion index of (20.07%), and lower hardness (53.85%) relative to BC-UT prepared from untreated flour. Extrudate BC-DHT adhered to a large cell volume having 16.55 times enlargement with higher resistant starch relative to extrudate BC-UT. Thus, a slow-digestible breakfast cereal, developed using thermally-modified Kodo millet flour (DHT20-4h) ensured better texture and expansion, strengthening a shift to climate-resilient millet production, guaranteeing value addition, for better nutrition and health. Keywords: Kodo millet, expansion, amylose, dry-heat treatment, breakfast cereal