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Effect of degree of milling on physicochemical, protein, pasting and phenolic compounds of head and broken rice from different cultivars

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Objective: The objective of the present study was to study the effect of degree of milling on physicochemical, protein, pasting, X-ray diffraction and phenolic compounds of the head and broken rice from different cultivars.

Methodology: Pasting properties, amino acids, phenolic compounds, X-ray, hydrophobicity and physicochemical properties of head and broken rice from different cultivars.

Results and discussion: The present study was evaluated to see the effects of degree of milling (DOM) between 6%, 8% and 10% on physicochemical, pasting properties, amino acids, phenolic acids and X-ray diffraction of head and broken milled rice from different paddy cultivars (PB1, PS44, PB1509, PB1121, and PS5) were investigated. Amongst all the paddy cultivars, head rice showed higher protein content, essential amino acids, antioxidant activity, phenolic acids and paste viscosities as compared to broken rice. PB1121 showed the highest head rice yield while PB1509 showed the lowest. Essential amino acids and hydrophobicity slightly decreased as DOM increased. Pasting temperature and paste viscosities were increased with increased DOM. The decrease in the crystallinity due to higher amylose was observed as DOM increased. Antioxidant activity, total phenolic content, head rice yield, and lipids decreased while blue value and λ_{max} increased with increase in DOM. The concentrations of ferulic acid, p-coumaric acid, and protocatechuic acid in bound form while gallic acid in free form was observed to be decreased as DOM increased. Higher the DOM, greater are the losses because the germ and bran layers are nutritionally rich are removed during milling which affects the overall quality of rice. Rice grains which are milled to lower DOM are more nutritious than the rice milled to higher DOM.

Conclusion: PB1121 was observed to be the best due to higher head rice yield, protein content, essential amino acids, ferulic acid, p-coumaric acid, protocatechuic acid and antioxidant activity.

Biography

Priyanka is a Research Scholar in Department of Food Science & Technology, Guru Nanak Dev University, Amritsar (INDIA). Her broad area of research is to study the effect on physicochemical, protein, pasting, phenolic compounds, morphological, granule size distribution and functional properties of different rice cultivars. She had been a member of Association of Food Scientists and Technologists (India). These days she is working as an UGC-BSR fellow.

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