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Superior Usability of Rice Bran: in Search of the Best Out of Waste!

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Abstract

Bran is a milling byproduct of rice. Rice bran is underutilized due to lipolytic enzyme mediated rancidity and its subsequent associated nutritional loss. Bran layer can serve as a source of novel lipolytic enzymes (lipase, esterase, lipoxygenase) which can be purified in order to exploit its catalytic property for industrial application and value addition to the underutilized rice bran layer. To do so traditional bran stabilization has to be avoided in order to safeguard both the nutritional properties and novel lipolytic enzymes. Instead of using bran as only cattle feed or consumable oil extraction, proteomics analysis can be performed to explore the superior usability of enzyme mediated commercial product development which can also serve as an alternative to microbial lipolytic enzymes.

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Introduction

Rice processing or milling produces many streams of materials together with polished rice, bran, and husk. In developing countries, rice bran was considered as a by-product of rice milling process was commonly used in animal feed or discarded as a waste (Sharif *et al.*, 2014). Rice bran was a by-product of rice milling with an annual global production volume of about 70 million tonnes (FAOSTAT, 2012). Rice bran is underutlilized due to lipolytic-mediated oxidation of rice bran lipids resulting in rancidity after milling (Enochian *et al.*, 1980). Bran stabilization is a promising attribute both for degrading lipolytic enzymes and preventing rancidity which comes with an unavoidable consequence of nutritional loss due to extreme heat or chemical treatment.

Present article focuses on a unique way of value addition to the superior usability rice bran without stabilizing the rice bran as a result of which nutritional intactness can be ensured with possible opportunity of characterizing the enzyme responsible for rancidity while using the same for commercial value addition. This approach can give a better understanding towards enzyme kinetics of rancidity and at the same time keeping all the nutritional value of bran intact which would have been destroyed if the stabilization process was followed.

Process Involved from Bran Lipolytic Enzyme's Purification to Proteomics Analysis

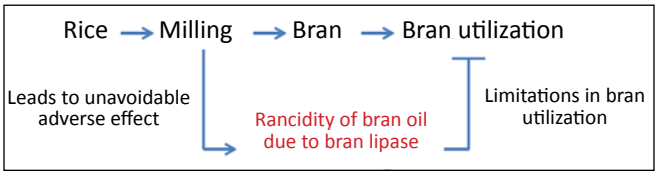

Figure 1: Normal process of rice bran utilization

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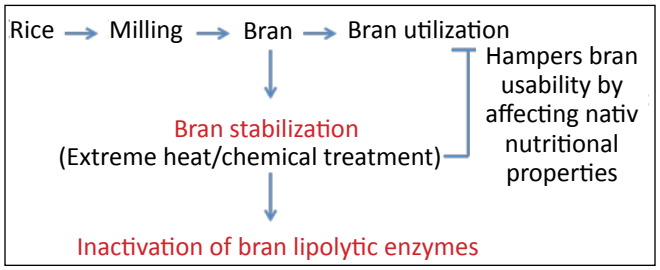

Figure 2: Common practice to overcome rancidity problem

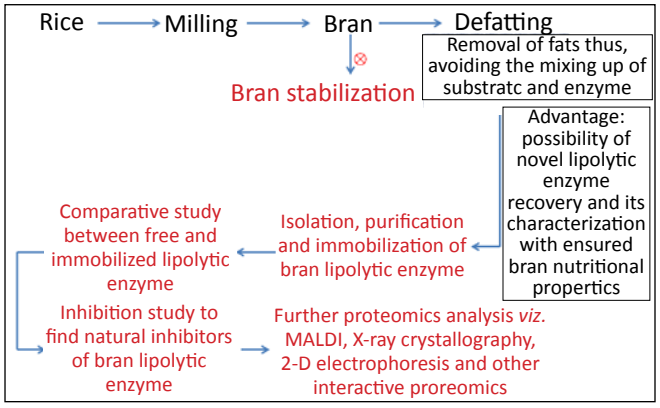

Figure 3: Proposed flow of work

Conclusion

Ever-growing evidence is very persuading that upcoming major advances in clinical nourishment will be the determination of the ideal sorts of lipids when detailing specific eating regimens. In this juncture lipolytic enzymes are considered as emerging tool of scientific experts, inferable from their capacity to catalyze different sorts of reactions. The present article summarizes a brief process of purifying a lipolytic enzyme and its subsequent proteomics analysis which can give a value addition to the existing usability rice bran without stabilizing the rice bran. As a result of which plant lipolytic enzymes can get much attention as biocatalysts. The plant based lipolytic enzymes and their possibilities as biocatalysts for lipid biotransformations can open up new alternatives to microbial lipase due to higher production cost and cumbersome purification process associated with the later.

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