

GC–MS based fatty acid profiling and multivariate analysis of rice bran oil from traditional Sri Lankan rice varieties

H. M. N. S. Dissanayake, E. M. R. K. B. Edirisinghe*

Department of Chemical Sciences, Faculty of Applied Sciences, Rajarata University of Sri Lanka, Mihintale, Sri Lanka.

**ranjith_e@rjt.ac.lk*

Rice bran oil extracted from twenty traditional Sri Lankan rice varieties was analysed to evaluate variations in fatty acid composition and nutritional quality using GC–MS and multivariate statistical analysis. Rice bran samples were subjected to Soxhlet extraction using petroleum ether followed by preparation of fatty acid methyl esters (FAMES) and GC–MS analysis. All analyses were performed in quadruplicate to ensure data reliability. The major fatty acids identified were oleic acid (44.19%), linoleic acid (28.11%), and palmitic acid (19.90%), while stearic acid, α -linolenic acid, and several long-chain fatty acids were detected in minor quantities. The overall fatty acid distribution comprised 25.26% saturated fatty acids (SFA), 44.77% monounsaturated fatty acids (MUFA), and 29.00% polyunsaturated fatty acids (PUFA), indicating a favorable nutritional lipid balance in the analysed rice bran oils. Principal component analysis (PCA) revealed compositional variation among the rice varieties, with the first two principal components explaining 59.5% of the total variance. Hierarchical cluster analysis classified the varieties into three groups mainly

according to differences in oleic, linoleic, and palmitic acid contents, while discriminant function analysis further supported the observed group separation. Although the rice varieties exhibited broadly similar fatty acid profiles, multivariate analysis identified comparatively distinct compositional patterns among several varieties. These findings demonstrate the usefulness of multivariate statistical approaches for differentiating traditional Sri Lankan rice varieties and highlight the nutritional potential of selected varieties as sources of high-quality edible oils.

Keywords:

Rice bran oil, fatty acid composition, GC–MS, multivariate analysis, traditional rice varieties

Acknowledgment:

Financial Assistance of Rajarata University Research Grant No: RJT/R&PC/2026/R/FOAS/07 is acknowledged.