Multi-Omic Approaches for Authenticating and Enhancing Value of Coconut Varieties

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ABSTRACT:
Ensuring food authenticity and consumer trust is increasingly vital in the global market. In coconuts, traits such as aroma and makapuno (curd coconut) are highly valued for both consumer preference and commercial use. This study highlights the application of multi-omic technologies to improve the authenticity, quality, and market value of coconuts. Through genome and transcriptome analyses, we identified natural variations associated with aroma and makapuno traits across diverse germplasm and developed DNA markers for accurate varietal identification and breeding. In addition, metabolomic profiling was used to explore health-related properties and to support quality standardization, particularly for Geographical Indication (GI)-designated coconuts. The integration of genomic and metabolomic insights not only facilitates marker-assisted selection but also contributes to the authentication of premium coconut products, strengthening both consumer confidence and international market competitiveness.

KEYWORDS:
Coconut, aroma, makapuno, genome, DNA marker