

Application of Sensomic-Based Expert System (SBES) for the Characterization of Aroma and Flavor in Various Mango Varieties: Innovations in Aroma and Flavor Quality Analysis of Food Products for Value Addition

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ABSTRACT:

The aroma and flavor of food products play a crucial role in the development and quality control of food and agricultural products. This research presents the application of advanced aroma analysis techniques (sensomics) to study the specific characteristics of various mango varieties. The research team developed a sensomics-based expert system (SBES) technique for the precise and rapid qualitative and quantitative analysis of mango aroma. Unlike conventional GC-MS analysis, which generates a volatile profile that may lack direct correlation to the real key aroma profile of mango, the SBES approach is specifically designed to identify, quantify, and prioritize aroma-active compounds that are truly responsible for the sensory perception of mango aroma. This targeted identification provides actionable insights for product development and quality assurance, ensuring that the analysis is directly relevant to consumer sensory experiences. The results can be applied to the development of mango aroma and related products. Furthermore, the SBES technique has also been applied to other types of food, with a focus on analyzing key aroma compounds. This research also integrates SBES with methods for analyzing other components related to aroma and flavor, such as organic acids, amino acids, sugars, and ions, as well as data from sensory evaluation and the use of an electronic tongue (e-tongue) to identify the unique characteristics of mangoes from various regions.