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(57) Abstract :

[040] The present invention discloses a non-invasive, field-deployable system for identifying high-charantin genotypes of bitter gourd (Momordica charantia L.) using observable morphological characteristics processed through machine learning algorithms. By utilizing features such as fruit length, ridge count, surface glossiness, curvature, and color intensity, the system employs predictive models based on multiple linear regression and artificial neural networks to estimate charantin content. The invention eliminates the need for expensive chromatographic or molecular assays and enables real-time classification into high, medium, or low charantin categories via a mobile-friendly application. This technology supports low-cost phenotypic selection, accelerates breeding programs, and provides farmers and breeders with an accessible tool for promoting nutraceutical-rich crop development. Accompanied Drawing [FIGS. 1-2]

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