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Genetic variabilities of Stevia rebaudiana Bertoni cultivated in Malaysia as revealed by morphological, chemical and molecular characterisations (Article)

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Abstract

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Stevia rebaudiana Bertoni originally from Paraguay belongs in Asteraceae family. It is an alternative source of non-caloric sweetener due to the sweet steviol glycosides contained in the leaves. As an introduced species in Malaysia, it is important to elucidate the genetic variabilities and relatedness among stevia accessions in order to broaden the genetic basis for future stevia breeding. This study described morphological and chemical variations and investigates genetic relationships among stevia accessions derived from across Malaysia and Paraguay using inter simple sequence repeats (ISSR) markers. HPLC (high-performance liquid chromatography) analysis also revealed high variability with stevioside content between 4.54% (Taman Pertanian) to 20.36% (Bangi) and rebaudioside A content varied between 0.3% (Nilai) to 2.04% (MNQ). From 32 ISSR markers, a total of 332 bands were scored, of which 264 (78%) were polymorphic. The dendrogram from UPGMA (Unweighted Pair Group Method with Arithmetic Mean) cluster analysis separated 17 stevia accessions into 3 main groups. Rawang and Nilai were found to be closely related. The wide genetic variabilities among stevia accessions are a promising indicator towards the development of new stevia varieties. This valuable information will be able to assist parental selection in future stevia breeding programmes. © 2018 Universitas Brawijaya.

Author keywords

Genetic variabilities | ISSR marker | Morphology | Stevia rebaudiana | Steviol glycosides

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