

# **REMAP and ISSR genetic diversity analyses for distinguishing the local ginger of Thua Thien Hue (*Zingiber officinale* Roscoe) from other ginger types in Vietnam**

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People in Thua Thien Hue have long believed that the ginger population grown in this region (“Hue’s ginger”) is a unique “variety” which contains more essential oil than other ginger types of Vietnam. However, local people’s differentiation of ginger kinds in Thua Thien Hue is mainly based on rhizome sizes. Therefore, choosing the right “variety” for cultivation becomes extremely confusing. Molecular markers could overcome this detrimental drawback of morphological markers and be used for correctly selecting the ginger variety. Unfortunately, there has been no research on distinguishing Hue’s ginger from other ginger types at molecular scale.

There are two efficient markers which have been used in studies on ginger genetic diversity analysis namely REMAP, based on the amplification of the sequence between a LTR and a SSR or ISSR region, and ISSR, involving in amplification of regions flanked by SSRs.

Considering the lack of scientific evidence for differentiating Hue’s ginger from other ginger kinds and the competence of REMAP and ISSR, this research was conducted to find out whether Hue’s ginger is truly different from the kinds of ginger cultivated in other Vietnam’s regions or not.

It is indicated by AMOVA based on REMAP data that there are significant differences among tested ginger populations (P1 – Hue’s ginger, P2 – other ginger types found in Thua Thien Hue and P3 – other ginger types in Vietnam), which account for 35 % of the total variances ( $P < 0.01$ ). Moreover, REMAP is proven to be more effective than ISSR in distinguishing Hue’s ginger from the other ginger types, although the latter marker could produce high numbers of polymorphic and unique amplicons of 52 and 10, respectively. Specifically, two cluster analyses (UPGMA and PCoA) based on ISSR binary matrices are not suitable for separating Hue’s ginger

from ginger kinds collected in other Vietnam's regions, which was perfectly done by the ones based on REMAP matrices.

Keywords: *Zingiber officinale* Roscoe, Hue's ginger, genetic diversity, REMAP, ISSR.