

Supannika Sanguansil 2012: Genotype by Environment Interaction of Phenolic Compounds in Guava Fruit. Master of Science (Plant Breeding), Major Field: Plant Breeding, Faculty of Agriculture at Kamphaeng Saen. Thesis Advisor: Assistant Professor Kriengsak Thaipong, Ph.D. 118 pages.

Fruits of 21 guava cultivars consisted of 9 white, 2 maroon, 7 pink and 3 creamy-fleshed collected in summer and rainy season of 2010 and in winter seasons of 2011 were determined for antioxidant activity (AOA), 11 phenolics content (gallic acid, ellagic acid, ferulic acid, chlorogenic acid, quercetin, kaempferol, myricetin, catechin, epicatechin, apigenin and cyanidin-3-glucoside), ascorbic acid content and fruit qualities. Guava cultivars showed large variation for all traits that were 6.9 - 17.1 $\mu\text{Mol/g}$ fresh weight (FW) in AOA, 119 - 239 mg/100 g FW in total phenolics content, 30 - 140 mg/100 g FW in ascorbic acid content, 54 - 526 g in fruit weight, 61 - 115 in Hue angle of skin color (Shue), 24 - 116 in Hue angle of flesh color (Fhue), 6.6 - 10.7 %Brix in total soluble solids and 0.25 - 1.42% in titratable acidity. The major phenolic compounds in guava fruits (> 10 mg/100 g FW) were catechin (26.7 - 86.6), ferulic acid (25.0 - 65.3) and quercetin (11.8 - 65.6%) whereas the other 8 compounds were relatively low contents (< 10 mg/100 g FW). The highest value of most of antioxidant activity, phenolics content and ascorbic acid content were found in maroon-fleshed guavas. Variance component analysis showed that genotypic effect ranged from 1.2% in gallic acid content to 82.6% in kaempferol content, seasonal effect ranged from 0.0% in gallic acid and kaempferol content to 22.1% in ascorbic acid content, genotype by season interaction effect ranged from 5.2% in quercetin content to 35.0% in chlorogenic acid content and among fruits within genotype effect ranged from 3.2% in Fhue to 81.1% in quercetin content. Large genotypic variance of phenolic compounds was found in kaempferol (82.6%), apigenin (78.7%) and cyanidin-3-glucoside (62.8%). Phenotypic correlation analysis revealed that antioxidant activity was positively correlated with phenolic compounds and ascorbic acid but was negatively correlated with fruit weight, Shue and Fhue.

Student's signature

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