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Physical and Chemical properties of flour and starch from unripe and ripe Thai mangoes

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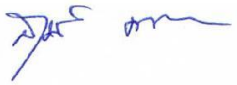
Abstract

Mango (Mongjfera India) is a tropical fruit and an important crop in Thailand. The mango fruit can be eaten as both unripe and ripe fruit. In addition, it has a high nutritional value. Most research has been conducted on chemical constituents within mango pulp and these mangoes are not Thai varieties. The nutrition and physicochemical properties of Thai mango cultivars haven't been studied. Therefore, this project is interested to use two different varieties of mangoes, Khiew Morakot and Nam Dok Mai with different characteristics (ripe and unripe stage), to study their chemical constituents. The ash content of the Nam Dok Mai and Khiew Morakot flour was 1.85 and 2.09%. The Protein content of Nam Dok Mai and Khiew Morakot flour had 4.04 and 3.02%, The fat content of the Nam Dok Mai and Khiew Morakot flour was 1.25 and 0.86%. Nam Dok Mai and Khiew Morakot flour had higher fat content than that in the ripe stage. The amount of reducing sugar was less than that in the ripe stage. The total sugar content of Nam Dok Mai flour and Khiew Morakot flour was 0.94 and 1.23%. Total sugar content was higher than that in the ripe stage. The amounts of citric acid and malic acid in Nam Dok Mai and Khiew Morakot flour were 0.32 and 0.34% in Nam Dok Mai Flour and 0.6 and 0.6% respectively. The amount of acid in the two varieties of unripe mango flour was higher than that of ripe mangoes. Total starch content of Nam Dok Mai flour and Khiew Morakot flour was 47.32 and 82.78%. Total amount of starch in flour was less than that of the ripe stage, while Kaew Morakot flour had higher total starch than that in the ripe stage. The amount of resistant starch (RS) in Nam Dok Mai starch and Khiew Morakot starch was 15.35 and 5.30% Khiew Morakot starch and was less than that of the banana starch used as a control, which had a resistant starch content of 10.14%. The Amylose content of Nam Dok Mai starch was 29.55% which was less than that of Kaew Morakot starch (37.39%). The amylose content was associated with the physicochemical analysis values of the starch. The pasting temperatures of Dok Mai starch and Khiew Morakot starch were 75.08 and 79.43 °C. The Swelling and solubility at temperatures of 55, 75, and 95°C were 4.44, 11.38, and 15.91, respectively for of Dok Mai starch, and were 1.26, 4.46, and 8.19%, respectively for Khiew Morakot starch. The morphology of starch granules for Khiew Morakot starch is round and oval, while that of Nam Dok Mai starch is round and square. The starch granule size of Nam Dok Mai and Kaew Morakot starch granule was 30.14 µm and 22.50 µm, respectively. The sensory evaluation of Sweet taste and sour taste of unripe and ripe mango pulp of Nam Dok Mai and Khiew Morakot was conducted using QDA and the results were correlated with chemical constituents.

Keywords: mango; mango starch; mango flour; Khiew Morakot; Nam Dok Mai



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