

**Title** Changes in physicochemical properties of organic hulled rice during storage under different conditions

**Author** Kanitha Tananuwong and Yuwares Malila

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#### **Abstract**

Effects of packaging materials, storage temperatures and time on physicochemical properties of organic hulled red fragrant rice cv. Hom Daeng were investigated. The samples were vacuum-packed in oriented polypropylene/aluminium/linear low-density polyethylene or nylon/linear low-density polyethylene pouches and stored at ambient temperature or 15 °C for up to 12 months. Results from differential scanning calorimetry indicated that onset and peak temperature of gelatinisation of the aged rice samples increased after the 6th month while enthalpy of gelatinisation initially increased and then decreased after the 8th month. Measurements from the Rapid Visco Analyzer revealed that peak viscosity and breakdown of the rice pastes increased within the first 2 months, then decreased after the 6th month, whereas setback gradually increased during storage. Swelling power, at 70 and 90 °C, of the aged samples, tended to decrease after the 4th month. Lower storage temperature retarded those changes while packaging materials did not influence the changes. Changes in thermal and pasting properties of the aged samples were reversed after adding 2-mercaptoethanol. Hence, an increase in disulphide linkages of oryzenin during storage could play a crucial role in altering those properties. Sensory evaluation indicated a significant increase in hardness of the cooked rice prepared from the longer-aged samples ( $p \leq 0.05$ ). However, the cooked rice samples, deriving from the samples stored at ambient temperature for up to 12 months, were still acceptable for Thai consumers.