

Title Comparison of physicochemical properties in red rice and indica rice samples  
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### Abstract

Red rice has been a weed problem in much of the rice-growing area. Red rice is the same species as cultivated rice, *Oryza sativa* (L). but is a strong competitor of cultivated rice, thus reducing yields. This project aimed at characterizing the physical attributes of kernels and structure of starches from 16 red rice ecotypes from different counties or states in comparison with those from 2 indica rice varieties. The red rice and indica rice samples were manually cleaned, dehulled, milled, and the physical attributes of the head red rice kernels were measured. The head red rice samples were ground into flours and the moisture content, apparent amylase content, and crude protein of the 16 red rice samples were determined using standard methods. Starch was isolated from the 16 samples and characterized for the thermal properties using differential scanning calorimetry. The head rice yield among the red rice samples varied significantly. Dimensions of length, width, and thickness among different samples were close to each other. The protein content of different red rice samples varied greatly, ranging from 6.3 to 9.1%. In general the red rice samples had a higher protein content than the indica rices. Apparent amylase content for the rice samples ranged from 24.6 to 58.8% and the numbers varied significantly within each state. The onset gelatinization temperature of rice samples ranged 70.8-75.2 °C, the peak gelatinization temperature ranged 75.9-79.7 °C, and the enthalpy ranged 6.2-12.9 J/g. The most distinct difference between the red rice samples and the indica rice samples was their pasting properties. The red rice samples had significantly lower peak and final viscosities compared with the indica rices. This study indicated that a wide variation in physicochemical properties existed among different red rice samples and differences were also observed between the red rice and the indica rice samples.