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Physicochemical Properties of Japanese Native Red-Kerneled Non-glutinous Rice Cultivars of the Japonica Type

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Abstract:

To elucidate the physicochemical properties of Japanese native red-kerneled non-glutinous rice of the Japonica type cultivated without fertilizer application, a comparative study with 30 cultivars was made on the protein content, amylose content and amylographic characteristics of milled rice and the textural characteristics of cooked rice. The protein and amylose content of the red-kerneled rice used ranged from 6.0 to 9.7% and from 9.7 to 26.4%, respectively. These values for the Fukuoka Prefecture recommended variety (white-kerneled rice) used ranged from 6.5 to 6.9% and 15.6 to 20.9%, respectively. The maximum viscosity and breakdown values of the red-kerneled rice ranged from 170 to 545 B.U. and from 0 to 173 B.U., respectively. In the white-kerneled rice, these values ranged from 368 to 615 B.U. and from 68 to 235 B.U., respectively. The adhesion and hardness / adhesion ratio of the red-kerneled rice ranged from 0.00 to 0.29 T.U. and from 0.00 to 842.00, respectively. In the white-kerneled rice, these values ranged from 0.08 to 0.15 T.U. and from 44.80 to 80.75, respectively. Thus we saw that red-kerneled rice showed a larger variation in physicochemical properties than white-kerneled rice. Milled red-kerneled rice contained more protein and had lower maximum viscosity and breakdown values than white-kerneled rice. Cooked red-kerneled rice had lower adhesion and a higher ratio of hardness / adhesion than white-kerneled rice. The large variation in physicochemical properties of the red-kerneled rice is indicative that the breeding of new rice varieties for special utilization will be possible.

Keywords:

Amylographic characteristics, Amylose, Japonica type, Protein, Red-kerneled rice, Texture, IN JAPANESE

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