Effect of Parboiling on Minerals and Heavy Metal contents of Selected Sri Lankan Traditional Rice Varieties Grown under Organic Farming

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Abstract

This study was conducted to evaluate the effects of parboiling treatment on the minerals and heavy metal contents of six Sri Lankan traditional rice varieties (TRV); Kalu heenati, Pokkali, Gurusinghe wee, Kahawanu, Sudu murunga and Unakola samba. Paddy was soaked (60^{0}C, 3 ½ hours-for short grained rice or 4 hours-for long grained rice), steamed (100^{0}C, 20 minutes) and dried (50^{0}C, 12 hours) during parboiling. Metal contents were determined using ICP-AES for each variety in triplicates. Pokkali rice recorded the highest iron content (29.5 mg/100 g). This amount was further increased by 66.7% after parboiling. Iron content of the rest of the TRV decreased due to parboiling and ranged from 2.1 ± 0.1 to 3.5 ± 0.3 mg/100 g for un-parboiled rice and from 1.3±0.1 to 3.3±0.7 mg/100 g for parboiled rice. Parboiling slightly reduced the zinc content of these TRV except for Pokkali. Parboiled Pokkali contained the highest zinc content of 4.7±0.4 mg/100 g among all TRV irrespective of parboiled or not. Zinc content of the selected TRV ranged from 2.3±0.14 - 3.8±0.1 mg/100 g for un-parboiled rice and 2.1 ± 0.7- 4.7 ± 0.4 mg/100 g for parboiled rice. Parboiling did not have significant effect on the levels of potassium, magnesium, calcium and manganese contents except for Kahawanu. For Kahawanu, parboiling increased the potassium (12.3%), magnesium (64 %) and manganese (50%) contents. Heavy metals such as, Cd, Pb and Cu were not detected in the tested TRV varieties.

Keywords: Heavy metals, Minerals, Traditional rice varieties

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