and conditions
(i) A:B=1:1 (methanol, 65 °C, 3 hrs)
(ii) A:B=1:2 (methanol, 65 °C, 6hrs)

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Contents of heavy metals; cadmium, chromium and lead in selected rice varieties (*Oryza sativa* L.) grown under different agricultural management systems in Sri Lanka

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Rice is the staple food in Sri Lanka with a per capita consumption of about 108 kg of milled rice per year.[1] Presence of toxic metals/metalloids in rice above the threshold limit is detrimental to human life. Hence, systematic investigations leading to determination of toxic metals/metalloids in rice are important. In the present study, ten varieties of rice including traditional rice varieties (TRV) and newly improved hybrid rice varieties (NIHRV) were cultivated in two regions; one in Anuradhapura - Rambewa (an area where CKDu is prevalent) and the other; Kurunegala (an area where CKDu is not known to exist). The study was carried out under two different agricultural management systems; organic and conventional using split-plot design consisting of three replicates.

A total of 120 rice samples were collected from farming sites in these two regions of paddy plants at maturity stage. They were processed and microwave digested according to US EPA 3052 method and analyzed for the selected toxic metals; Cd, Pb and Cr using Hitachi ZA 3000 Polarized Zeeman graphite furnace atomic spectrometer.[2] Cd and Pb were analyzed in the presence of the matrix modifiers; $Mg(NO_3)_2$ and $(NH_4)_2HPO_4$ respectively. Certified reference material IRMM-804 RICE FLOUR was analyzed for validation of the analytical method. Method recoveries were in the range of 86 % to 121 %.

Cadmium content in rice samples analyzed (Bg 300, 366, 352, 358, 360, Suwandel, Madathawalu, Kuruluthuda, PachchaPerumal, KaluHeeneti) were in the range between 5.7 μg kg^{-1} and 184.0 μg kg^{-1} and it does not exceed the maximum allowed limit of 200 μg kg^{-1} set by Codex Alimentarious commission.[3] Further, compared to NIHRV, two selected TRVs; Pachcha Perumal and Madathawalu showed low levels of trace metals at both regions under the two different agricultural management conditions. Cd contents in these two varieties were in the range5.9 μg kg^{-1} to 99.5 μg kg^{-1}. Pb was undetectable in all rice samples analyzed. Cr content were in the range of 13.8 μg kg^{-1} to 290.8 μg kg^{-1} which is approximately one tenth of the maximum allowed limit of 2000 μg kg^{-1} set by Codex Alimentarious commission.[4] The findings shows that the rice grown in two regions do not contain the above metals beyond the safe levels.

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