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Determination of variation components of harvested rice seeds grown in selected areas of four grama niladari divisions in North Central Province

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During the last two decades, alarmingly high incidences of kidney failure and some associated deaths have become very significant in certain parts of Madawachchiya district and Uva Province and North Central Province. Since rice is the staple food of Sri Lankans, identification of variation components in rice seeds will be beneficial. Hence, this study aimed to find variation components in rice seeds grown in areas severely affected and not affected by Chronic Kidney Disease of unknown etiology (CKDu) in the North Central Province. After having a discussion with the farmers, rice seed samples of Bg 355 was collected from four grama niladari divisions, Karambankulama, Unagaswewa, Angunachchiya and Kirigollewa. Three samples from each division were randomly collected from different paddy fields which were treated with Compo and M-60 weedicides and the collected samples were stored for 6 months. Certain components of rice seeds such as starch, total flavonoids, free amino acids, crude fiber and crude protein content of rice seeds were tested. Free amino acids was analyzed by Moore and Stein method, flavonoids by Aluminum Chloride colorimetric method, crude fiber was analyzed by filtration method, starch by iodine test and crude protein amount was analyzed by Kjeldahal method. Triplicates (n=3) were done for each assay for each division. Since added fertilizer is common for all the samples, components which vary depend only on the geographical location within the province. Statistical analysis was done using Mini tab 18 version. According to statistical analysis, free amino acids and crude fiber content in Bg 355 rice seeds were comparatively higher in Kirigollewa (0.6750 ± 0.0636) and Angunachchiya (0.6600 ± 0.0283) areas severely affected by CKDu compared to Unagaswewa (0.3950 ± 0.0212) and Karambankulama (0.3800 ± 0.0141) areas less affected by CKDu. Total flavonoids were lesser in rice seeds in Kirigollewa (0.055 ± 0.007) and Angunachchiya (0.075 ± 0.007) areas severely affected by CKDu when compared to Unagaswewa (0.155 ± 0.007) and Karambankulama (0.135 ± 0.007) areas less affected by CKDu. Contents of starch and crude protein amount, does not show any significant difference related to CKDu affected and non-affected areas. Therefore, this analysis suggests that free amino acids, total flavonoids and crude fiber contents in rice seeds vary depending on the geographical location within the North Central Province. Further experiments in different areas and geographical locations are needed to confirm the variation of these components depending on the geographical location.

Keywords: Biomarker, CKDu, Kjeldahal method