

Novel nutraceutical properties of some Sri Lankan traditional rice: Inhibition of protein glycation and breaking of cross links of advanced glycation end products

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Glycation of proteins results in the formation of Advanced Glycation End products (AGEs) in the body and this is thought to be extremely important in the pathogenesis of diabetes complications. Free radicals have been shown to participate in AGEs formation and antioxidants/radical scavengers can inhibit this process. Rice bran (Rb) is a byproduct of process of milling and reported to contain antioxidative compounds. Therefore, the objective of the present study was to evaluate the effect of Rb on protein glycation inhibitory activity (PGIA) and AGE cross linking breaking capacity (ACLBC).

Ethanollic extracts (70 %) of brans of 4 traditional rice (*Oryza sativa*) varieties (Masuran, Dik wee, Goda Heeneti and Sudu Heeneti) were used in this study. Rb extracts of 1.56, 3.12, 6.25, 12.5, 25, 50 and 100 µg/ml were subjected to PGIA assay (n=6) according to Matsuura *et al.*, 2002 with some modifications. Rb extracts of 6.25, 12.5, 25, 50 and 100 µg/ml were used (n=6) to determine the ACLBC.

Rbs of all the selected traditional rice varieties showed very high PGIA and ACLBC in a dose dependent manner. IC₅₀ of protein glycation and ACLBC among different varieties were statistically significant (P<0.05). Masuran had the highest PGIA (4.92 ± 0.24 µg/ml), followed by Sudu Heeneti (5.79 ± 0.25 µg/ml), Dik wee (9.02 ± 0.23 µg/ml) and Goda Heeneti (12.06 ± 0.36 µg/ml). Sudu Heeneti (44.25 ± 0.62 µg/ml) and Goda Heeneti (46.07 ± 1.38 µg/ml) varieties had significantly high ACLBC. The EC₅₀ values for Masuran and Dik wee were 52.22 ± 1.11 µg/ml and 82.66 ± 3.34 µg/ml respectively.

It is concluded that, consumption of brans of selected Sri Lankan traditional rice may play an important role in prevention of glycation-associated diseases. Further, this is the first study to report the protein glycation inhibitory activity and AGE cross linking breaking capacity in any varieties of rice worldwide.