Evaluation of Anti-oxidant Properties of Four Sri Lankan Traditional Red Rice Varieties

D.A.U.H. Perera[1*], H.R.M.G.C. Thilakarathna[2], D.R. Gimhani[1], J.A.A.C. Wijesinghe[3] and N.S. Kottearachchi[1]

[1]*Department of Biotechnology, Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka, Makandura, Gonawila (NWP), 60170, Sri Lanka*
[2]*Department of Animal and Food Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka, Puliyankulama, Sri Lanka*
[3]*Department of Bio-Systems Engineering, Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka, Makandura, Gonawila (NWP), 60170, Sri Lanka*
**Corresponding Author E-mail: asiniperera16@gmail.com, TP: +94771601514*

Rice grains with red pericarp tend to present relatively higher antioxidant activity than those with light brown pericarp colour because of their rich anthocyanin and proanthocyanidin content. Currently, large numbers of local rice breeders and consumers are interested in red rice varieties due to their potential health benefits provided through strong antioxidant properties. The current study aimed to assess the antioxidant properties of four selected traditional red rice varieties in Sri Lanka, namely, *Pachchaperumal, Kaluheenati, Suduheenati* and *Madathawalu.* The extracts obtained from rice brans were examined for their total phenolic content, DPPH radical scavenging activity, total proanthocyanidin content, total flavonoid content and total anthocyanin content. Total phenolic content was examined in both soluble and bound fractions using the Folin–Ciocalteu's method. DPPH radical scavenging activity from bound fraction was assessed using 0.1 mM DPPH solution. The results were analyzed using One-Way Analysis of Variance (ANOVA) followed by Turkey's pair-wise test as the post-hoc analysis. The amounts of phenolics in the soluble fraction were much higher than those in the bound fraction of these four red rice samples. According to the results, *Kaluheenati* showed the significantly highest value ($p < 0.05$) for total phenolic content (soluble: 54.49 mg gallic acid equivalents /100g; bound: 24.31 mg gallic acid equivalents /100g) and total proanthocyanidin content (138.15 mg catechin equivalent /100g), while *Madathawalu* showed the significantly highest ($p < 0.05$) value for DPPH radical scavenging activity (73.5 %) and total anthocyanin content (24.57 mg cyanidin-3-glucoside equivalents /100g). The highest value for total flavonoid content was examined in a variety of *Pachchaperumal* and it was 183.59 mg quercetin equivalents/100g. According to the present results, it could be speculated that *Pachchaperumal* may contain a higher amount of other flavonoids compared to anthocyanins. And also the promising contribution of total anthocyanin content and proanthocyanidin content for higher antioxidant activity was indicated by the present results. In conclusion, according to the present study, both *Kaluheenati* and *Madathawalu* exhibited the highest overall antioxidant properties, than the other tested varieties. Further studies are required to conduct with increased sample sizes along with different extraction systems, to explore the nutritional values.

***Keywords*:** Anthocyanins; Antioxidant; Proanthocyanidins; Traditional red rice