ANTIOXIDANT ACTIVITY OF SELECTED RED AND WHITE RICE (*Oryza sativa* L.) VARIETIES OF SRI LANKA

A dissertation submitted to theFaculty of Science and Technology, Uva Wellassa Universityin partial fulfilment of the requirements for the award of theDegree of Bachelor of Technology

by

GARDIYE HEWAWASAM DODAMGODAGE
ISHAKYA UMESHANI DODAMGODA

Faculty of Science and Technology
Uva Wellassa University
Sri Lanka

October 2014

ABSTRACT

Rice (*Oryza sativa* L.) is the dietary staple in Sri Lanka. There are thousands of different Sri Lankan traditional rice varieties and nearly fifty improved rice varieties cultivated in different agrochemical regions in the country. Rice bran is one of the most abundant co-products produced in the rice milling industry and research conducted in last two decades has shown that it contains a unique complex of naturally occurring antioxidant compounds. However, Sri Lankan rice varieties have not gained significant attention on measuring these antioxidants. Therefore, this study was conducted to evaluate the antioxidant properties of some Sri Lankan rice varieties.

Freeze-dried 70% ethanolic extracts of brans of five white and six red rice varieties were screened for antioxidant properties in this study. Antioxidant properties of rice bran extracts of selected rice varieties were evaluated by using total polyphenolic content (TPC) (n=3), ferric reducing antioxidant power (FRAP) (n=6), 1,1-diphenyl-2-picryl-hydrazyl (DPPH) radical scavenging (n=3) and 2-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) radical scavenging (n=6) *in vitro* antioxidant assays.

Significant differences were observed among bran extracts of selected rice varieties for investigated antioxidant properties ($P<0.05$). Mean TPC, FRAP , DPPH and ABTS antioxidant properties were in the range of 9.33 – 212.33 mg gallic acid equivalents/g of extract, 1.13 – 18.89 mmol Trolox equivalents (TE)/100g of extract, 2.85-43.32 inhibition %, 23.93-98.34 inhibition % for 1g rice bran respectively. Resulted mean values of the antioxidant activity of red rice varieties, for all four assays were significantly higher than that of white rice varieties.

It is concluded that brans of Sri Lankan rice varieties, especially red rice varieties have higher antioxidant properties and could be use as potential sources for the prevention of chronic degenerative diseases in Sri Lanka.

Key words: rice bran, antioxidant, *in vitro*, assay, chronic degenerative diseases