

Potential of substituting wheat flour with ‘Kiri-ala’ (*Xanthosoma sagittifolium*) flour in bread making

R. Nanayakkara and K.D.P.P. Gunathilake*

Department of Food Science and Technology, Faculty of Livestock, Fisheries and Nutrition, Wayamba university of Sri Lanka, Makandura, Gonawila, 60170, Sri Lanka.

Bread made with imported wheat flour plays a vital role in typical Sri Lankan diet. To reduce wheat importations, there is a trend of using locally available underutilized crops as a substitute. This study was aimed to evaluate the potential of utilizing ‘Kiri-ala’ (*Xanthosoma sagittifolium*), Sri Lankan underutilized tuber crop as a partial substitution for wheat flour and to evaluate its nutritional value. ‘Kiri-ala’ flour blends were analyzed for proximate, antioxidant and rheological properties.

Proximate chemical analysis of ‘kiri-ala’ flour revealed that it contains protein, crude fibre, carbohydrate, fat, moisture and ash $4.32\pm 0.03\%$, $2.29\pm 0.17\%$, $81.62\pm 2.68\%$, $1.28\pm 0.02\%$, $6.96\pm 0.15\%$ and $3.53\pm 0.06\%$ respectively. Total phenol content, total antioxidant capacity, free radical scavenging capacity and reducing power were 8.79 ± 1.07 garlic acid equivalent (GAE mg/g), 80.13 ± 7.17 ascorbic acid equivalent (AAE mg/g), $3.6\pm 0.95\%$ and $8.16\pm 0.55\%$ equivalent inhibition of ascorbic acid respectively. Wheat-‘kiri-ala’ flour blends were prepared by incorporating 10%, 20%, and 30% ‘kiri-ala’ flour in wheat flour. Blends were evaluated for rheological properties. Mixing behavior of the blends was determined by Farinograph. Water absorption, development time and arrival time increased with the increase in substitution, while dough stability was decreased after 10% substitution level. As conclusion ‘Kiri-ala’ substitution level is possible up to 20% without alternating original wheat dough properties.

Keywords: Antioxidant properties, Bread, Composite flour, Kiri ala (*xanthosoma sagittifolium*), Rheological properties

*kdppgunathilake@yahoo.com