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Important physiochemical properties of selected underutilized yams and development of cup-cakes using “Raja ala” (*Dioscorea alata*) flour

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Sri Lanka has many underutilized yams with high nutritional potential. Most of these underutilized species have lost their significance among the present generation due to many reasons such as urbanization and changing food habits. The objective of this study was to evaluate the nutrient composition, and physiochemical properties of five selected underutilized yam varieties in Sri Lanka; “Raja ala”, “Kidaramala”, Aralog-green, Aralog-red, and “Katu ala”. In addition, cup-cakes were developed using “Raja ala” flour with food gums including pectin 0.3% (w/w based on flour). Yams were collected, peeled, dried, ground, and sieved to obtain fine flour powder. The proximate analysis was carried out to calculate the moisture content, crude protein, total fat, total carbohydrate, and total ash. Then, the texture profile of cupcakes including hardness, deformation, adhesiveness, cohesiveness and springiness were analyzed. The moisture content of both flesh and peel from each five varieties varied between 6.20% and 7.82% (dry weight, w/w). All five varieties were low in fat content and highest was recorded in “Raja ala” ($1.10 \pm 0.01\%$), whereas the lowest was recorded in “Katu ala” ($0.27 \pm 0.16\%$). The crude protein content of “Raja ala” and Aralog-green were $4.62 \pm 0.59\%$ and $3.89 \pm 0.57\%$, respectively. The highest ash content was recorded in “Kidaram ala” ($5.88 \pm 1.30\%$) and the lowest was recorded in Aralog-red ($1.65 \pm 0.04\%$). By incorporating pectin, gluten free cupcakes were prepared with “Raja ala” flour. According to the results, the hardness at cycle 1 and cycle 2 were 6065.00 g and 4335.00 g respectively. Also, the stringiness length, cohesiveness, adhesiveness and springiness were 14.63 mm, 0.31, 11.30 mJ and 36.46 mm respectively. Furthermore, the analysis of antioxidant potential and total phenolic content of both peel and flesh of the above selected yams, flour properties, and sensory qualities of developed cup cakes are in progress.

Keywords: Cup-cakes, *Dioscorea alata*, flour, raja ala, underutilized yams