

Physicochemical and functional properties of flours obtained from *Dioscorea alata* L. and *Dioscorea esculenta* (Lour.) Burkill yams available in Sri Lanka

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Yams are considered as starchy based staple food crops. The objective of this study was to evaluate physicochemical and functional properties of *Dioscorea alata* (Kahata-ala) and *Dioscorea esculenta* (Java-ala) flours which are important to be known in food processing. Functional properties of flours may depend on the availability of starch, dietary fiber, resistant starch and amylose and amylopectin contents. Water holding capacity, oil holding capacity, swelling power and water solubility were analyzed under physicochemical properties. Starch granular shapes were observed by scanning electron microscope. Significantly highest starch content ($p < 0.05$) was observed in *D. alata* flour as 74.11 ± 0.27 % among two varieties. The total dietary fiber contents of *D. alata* and *D. esculenta* showed as 11.75 ± 0.26 % and 36.06 ± 0.37 % and resistant starch contents were as 7.52 ± 0.19 % and 20.68 ± 0.38 %. Amylose contents were observed as 35.50 ± 0.27 % and 16.00 ± 0.19 % for *D. alata* and *D. esculenta* respectively. Significantly ($p < 0.05$) highest water holding capacity was shown in *D. esculenta* flour and there was no significant different in oil holding capacity in two types. *D. esculenta* flour showed significantly higher values for swelling power (13.98 ± 0.19 g/g) and water solubility (3.72 ± 0.03 %). Starch granules of *D. alata* presented as large individual spherical shape granules while starch granules of *D. esculenta* was observed as polygonal shape individual starch granules and agglomerated granules preparing large globular structures. Both tested varieties were having considerable amount of dietary fiber and resistant starch along with preferable physicochemical properties that could lead to several health benefits and are favorable for food processing.

Keywords: *Dioscorea alata*, *Dioscorea esculenta*, functional properties, physicochemical properties, yams

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