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Characterization of *Solenostemon rotundifolius* and *Dioscorea pentaphylla* Yam Starches as Excipients Compared to Maize Starch BP

Kankanamge S.U.[1#], Jayasuriya W.J.A.B.N.[2], Herath H.M.D.R.[2] , Pathirana R.N.[1]
[1]*Department of Pharmacy, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka*
[2]*Department of Pharmacy and Pharmaceutical Sciences, Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Sri Lanka*

[#]***Corresponding author:*** *upekshisk@kdu.ac.lk*

Background: Starch is one of the most extensively used pharmaceutical excipients with minimal processing that could meet most of the requirements for excipients. Starch is the main component in yams and they are cultivated as tuber crops in many areas of Sri Lanka.

Objectives: To characterize the necessary physicochemical parameters of starch extracted from yams of *Solenostemon rotundifolius* (Innala) and *Dioscorea pentaphylla* (Katu Ala) in expounding its appropriateness as excipients compared to maize starch BP

Methods: Yams of *S. rotundifolius* and *D. pentaphylla* were unpeeled, sliced, air-dried, and powdered. Starches were extracted by mixing powdered yams with distilled water (1:2 w/v), filtering, and drying the precipitate at 40°C. The extracted starches and commercially available maize starch BP were characterized considering physicochemical properties such as pH, particle size, bulk, tapped and true densities, Hausner's ratio, Carr's index, angle of repose, hydration capacity, moisture sorption capacity, clarity, turbidity, Infrared spectroscopy analysis, and microscopic analysis. Statistical analysis was performed using SPSS version 23.0.

Results: There was no significant difference between *S. rotundifolius* starch and maize starch BP in terms of bulk density, tapped density, Hausner's ratio, and turbidity while *D. pentaphylla* starch did not report a significant difference in bulk density, clarity and turbidity compared to maize starch BP ($p>0.05$). Both yam starches exhibited fair flow properties while maize starch BP had poor flow properties. All these three starches exhibited identical IR spectra. Starch granule shapes of *D. pentaphylla*, *S. rotundifolius* and maize starch BP were oval, dome and polyhedral, respectively as per the microscopic analysis.

Conclusions: Both *S. Rotundifolius* and *D. pentaphylla* starches reported certain favourable parameters compared to maize starch BP. Therefore, modifying extracted starches and extraction techniques would enhance their properties.

Keywords: *Dioscorea pentaphylla, Pharmaceutical excipient, Physicochemical properties, Solenostemon rotundifolius, Starch*