

**Discovery of three varieties of *Dioscorea trifida* grown in Venezuelan Amazons, with quite low-amylose Starch: I. Physical attributes and proximate composition of the tubers and characterization of its waxy starches.**

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**ABSTRACT**

Yam *Dioscorea trifida*, is an economical and cultural important crop for indigenous from Amazon region of South America. These crops could be a potential supply of starch that would be good source for different food industries. Nonetheless, is very little known about their composition and its starch type. Consequently, in this study were characterized the physical attributes and proximate composition of the tubers, and were also isolated, purified and characterized the starches of three varieties of *Dioscorea trifida*, cultured at the Amazons of Venezuela by the indigenous community “*Piaroa*”. Results reveal noticeable differences in the morphology, whole external appearance of the three tubers, and also in the color, forms and sizes. The protein, ash, starch and fat contents were higher in the white variety than those of purple and black ones, but the total carbohydrates showed inverse tendency. The dietary fiber content was obviously higher in the black variety, than the other two. Despite in literature there are not report for waxy *Dioscorea trifida*, the data of amylose content reveal that these starches are waxy. Its starches are white with quite low amylose content, with some mineral content, especially phosphorous, with similar rheological behaviors; exhibiting a quite stable viscosity during the holding stage, high breakdown, similar consistency and low setback upon cooling down. The starches are large, oval or shell-shaped, truncated and with obtuse end, with smooth surfaces, with granules sizes of  $0.93 \pm 0.19 \mu\text{m}$ ;  $1.06 \pm 0.16 \mu\text{m}$ , and  $1.17 \pm 0.12 \mu\text{m}$ , for white, purple and black starches, respectively. The information offered in this paper is significant and important for the effective use of the tubers and starches from this *Dioscorea* genus.

Keywords: waxy starch, *Dioscorea trifida*, yams, root and tubers, physical attribute proximate composition.