



Evaluation of the nutrient and health potentials of wild and cultivated trifoliate yam (*Dioscorea dumetorum*) in Nigeria.

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Introduction

- Nigeria is endowed with sustainable food security crops, however most of these crops are underexploited.
- Trifoliolate yam (*Dioscorea dumetorum* pax) is an underutilized crop with high food potential.
- Trifoliolate yam, belongs to the genus *Dioscorea* and family *Dioscoreaceae*
- *Dioscorea dumetorum* has not been widely studied.
- *Dioscorea dumetorum* (Trifoliolate yam) consists of wild and cultivated cultivars.

- Some of the factors militating against increased trifoliate yam production in Nigeria are:


- Lack of knowledge on its composition

- long cooking time associated with the tuber

- severe hardening which develops after harvest

- high concentration of anti-nutrient factors leading to bitterness and toxicity

- lack of diversified utilization of the crop.

A photograph showing a large pile of Dioscorea dumetorum tubers, which are brown, elongated, and covered in fine roots. The tubers are resting on a light-colored, textured surface. A white rectangular label is placed in the foreground, partially overlapping the pile of tubers.

DIOSCOREA
dumetorum

Problem statement

- *D. dumetorum* is regarded as underutilized crop partly due to lack of detailed information on its compositional analysis.

Objectives

- This study investigates the nutritional and health potentials and opportunities of *D. dumetorum*.

Importance of study

- This study will be useful for potential uses of the tuber in the food industry, animal feed industry and cosmetic or pharmaceutical industry.

Materials and Methods

- *Dioscorea dumetorum* (wild and cultivated) tubers were obtained from National Root Crops Research Institute, Umudike.
- Proximate composition was determined with the AOAC (1990) method.
- Anti-nutrient factors were determined with the method of Obadoni and Ochuko (2001).
- Compounds present in the soxhlet ethanol extract were identified by GC-MS analysis using a GC-MS-QP2010 PLUS Shimadzu.

Results and Discussion

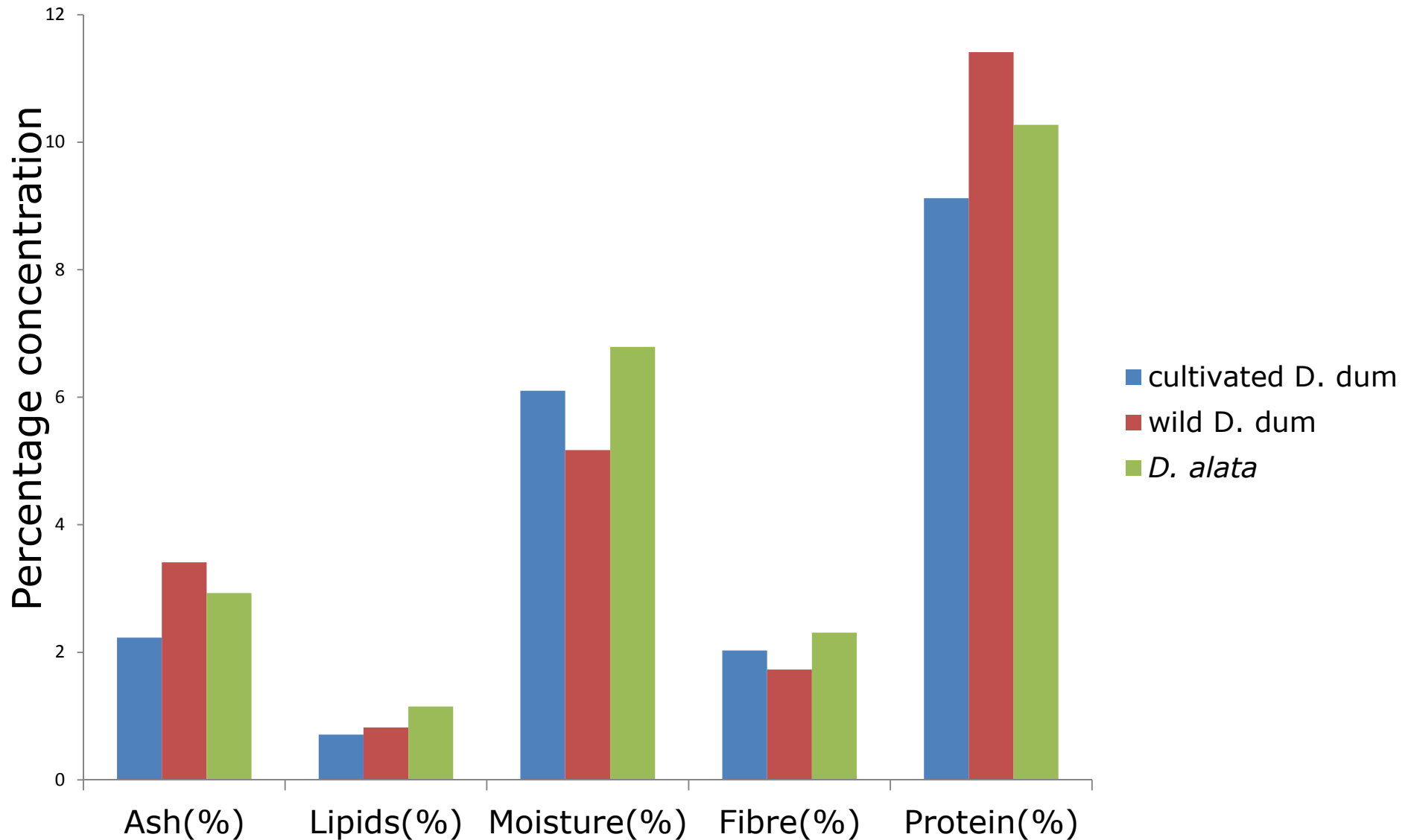


Figure 1: Comparative assessment of the nutrient composition of *D. dumetorum* and *D. alata*.

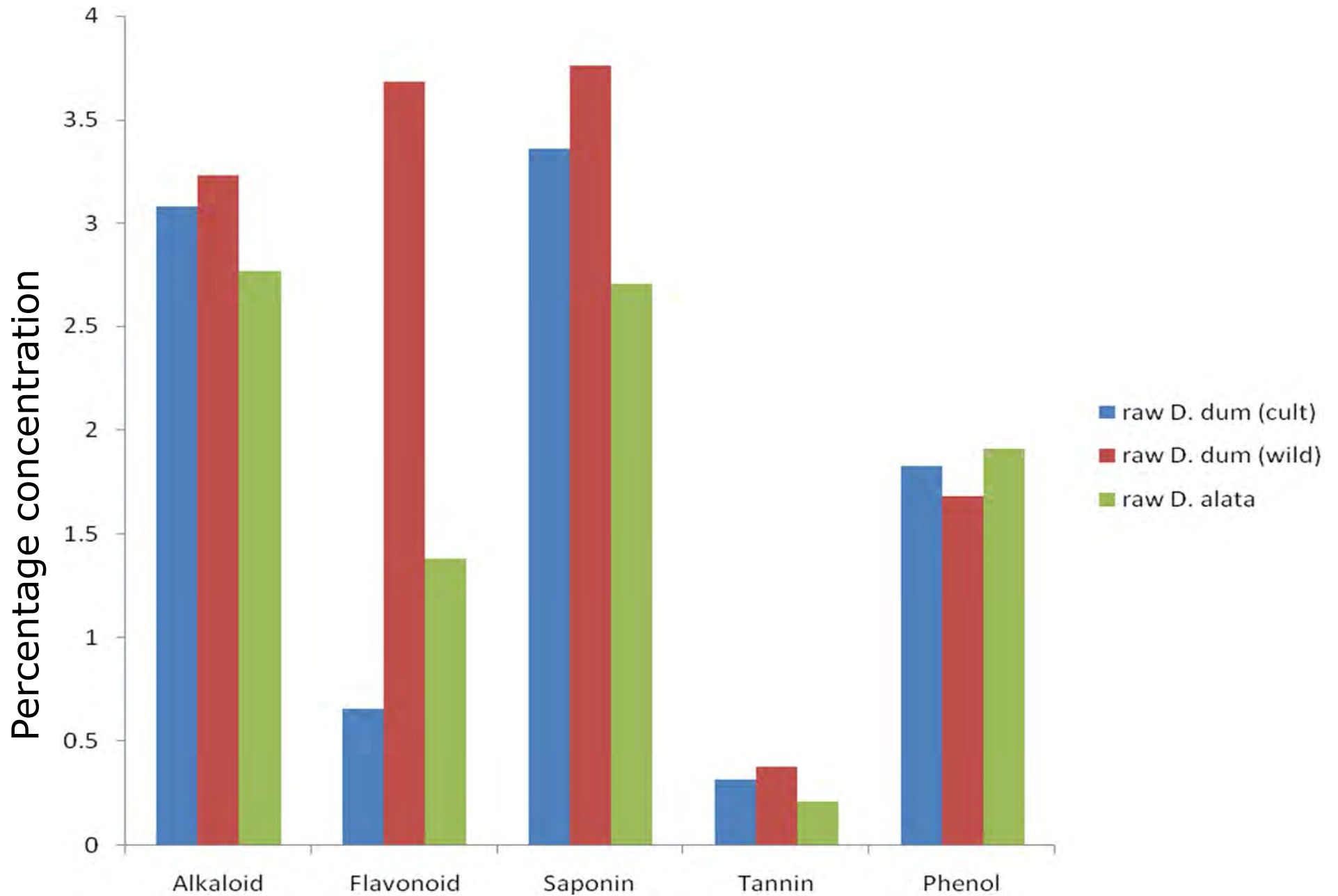


Figure 2: Anti-nutrient composition of *D. dumetorum* and *D. alata*.

Phytochemical components of *Dioscorea dumetorum*

Compounds	Ret. Time	<i>D. dum</i> (cult)	<i>D. dum</i> (wild)
Fatty acids			
Lauric acid	25.77	0.56	nd
Myristic acid	29.91	2.25	nd
n-pentadecylic acid	31.35	5.59	nd
Palmitic acid	32.59	21.82	10.83
cis-oleic acid	22.67	10.95	nd
Phenols			
3,5-Di-t-butyl phenol	23.63	1.18	1.47
3-Decanone.5-hydroxyl-1-(4-hydroxy-3-methoxyphenyl)	35.59	nd	3.38
Sterols			
17-(1,5-Dimethyl hexyl-10,13-dimethyl 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17 Tetradehydro-/H-cyclo-penta[a]phenanthren-3-ol	44.55	5.63	4.47
Aldehydes and ketones			
vanillyl acetone	27.075	nd	0.64
Alcohols			
9.12-octadecadien-1-ol	34.46	33.52	19.81
Hydrocarbons			
(1-methyl-2-piperidiny) methane	32.11	nd	19.16
Prntadec-1-ene	26.87	nd	0.7
Esters			
2-Hydroxy-1-(hydroxymethyl)ethyl ester	38.85	6.15	nd
Glycerol-1-monolinoleate	38.85	6.39	nd
Palmitic acid beta monoglyceride	37.46	6.07	nd
Methyl(13E,16E)-octadecadienoate	34.29	0.53	nd
Amines			
Oleic acid amide	36.23	1.12	1.92
Alkaloid			
Decahydro{1,7}naphthyridine	30.66	nd	21.09

- Compounds identified: fatty acids and their esters, phenols, sterols, aldehydes and ketones, hydrocarbons and amines.
- Fatty acids: Oleic acid, Palmitic acid, lauric acid, n-Pentadecylic acid and 1-Tridecane carboxylic.
- Phenols: 3,5, Di-t-butyl phenol and 3-Decanone-5-hydroxy-1-(4-hydroxy-3-methoxyphenyl)

- Ketone: Vanillyl acetone reported as an antioxidant.
- Sterol: 17-(1,5-dimethyl hexyl-10-13 dimethyl-1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17-tetradecahydro-/H-cyclo-penta[a]phenanthren-3-ol.
- Alkaloid: Decahydro{1,7} naphthyridine

Conclusion

- The results obtained from the work showed that *Dioscorea dumetorum* (both wild and cultivated cultivar) has high potential in contributing to food security and wellness in Nigeria.

Recommendation

- Programmes aimed at educating people on the potential value of these crops will help to improve people's perception of the crop.
- There should be more public and private sector investment on the production of the species.
- More funding of research specifically targeted at conserving and adding value to this underutilized specie is recommended.

Acknowledgement

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