THE NELSON MANDELA AFRICAN INSTITUTION OF SCIENCE AND TECHNOLOGY

The contribution of neglected Oyster nuts (Telfairia pedata) to Biodiversity Conservation and Improved Community Livelihoods in Northern Tanzania

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ABSTRACT

Oyster nut (Telfairia pedata (Sims) Hook) is a vine usually growing on tall hard wood tree species, and native only to northern Tanzania, Mozambique and Uganda. Its nuts are valued by the Northern Tanzanian natives because of its important nutritional and healthy oil seeds which are in great demand by pregnant and lactating women (due to lactogenic properties). The socio-economic importance, conservation strategies and prospects for improved production and utilization of oysternuts which would provide a more diversified food and oil sources necessary for address food and nutritional security concerns in Tanzania. Here, we present a few potential of neglected oyster nut which could be useful to agriculturists, researchers, conservators and nutritionists inorder to enhance prime utilization of the plant.

Introduction

> Neglected or underused plants are those ignored by science and development although are well adapted and competitive in nature.

> Telfairia belongs to Curcurbitaceae family and small genus of flowering plants in the squash family, which are native to Africa.

> Telfairia pedata (Oyster nut or Mkweme) is native to Tanzania and has important nutritional and healthy oily seeds.

> It is herbaceous dioecious vine, its gourd encloses 80-150 edible nuts and can weigh 7 to 20 kg.

> The seeds can last up to 8 years and plant has a life cycle up to 20 years

Justification

> No adequate information on its distribution (naturally and cultivated) and nutrient content

> Little is known on nutritional composition

> Unknown propagation methods and appropriate post-harvest technologies
Therefore, this study will generate information that can be integrated into sustainable conservation and utilization of oyster nuts.

General Objective:
To investigate the natural and farmed distribution, nutritional composition and assess the local knowledge for conservation of oyster nuts by small holder farmers in northern Tanzania.

Specific Objective:
> To map the distribution of oyster nuts populations across different land uses and environmental factors (elevation, temperature, rainfall);
> To examine the perceptions of local communities on the values of oyster nut for their livelihood (food, health, income) and

> To establish proximate, fatty acids and mineral composition of oyster nuts.

Oyster nut morphology

Materials and methods:
Socio-economic survey was purposely conducted to 346 respondents through questionnaires (structured and unstructured), Focus Group Discussion (FGD) and key informants were used to collect data.

Key issues: Perceptions, use, conservation measures, domestication, postharvest opportunities and constraints

GPS waypoints and coordinates were recorded.

Samples were collected during harvest period and lab analysis on proximate, fatty acids and mineral analysis was conducted.

Results and discussions

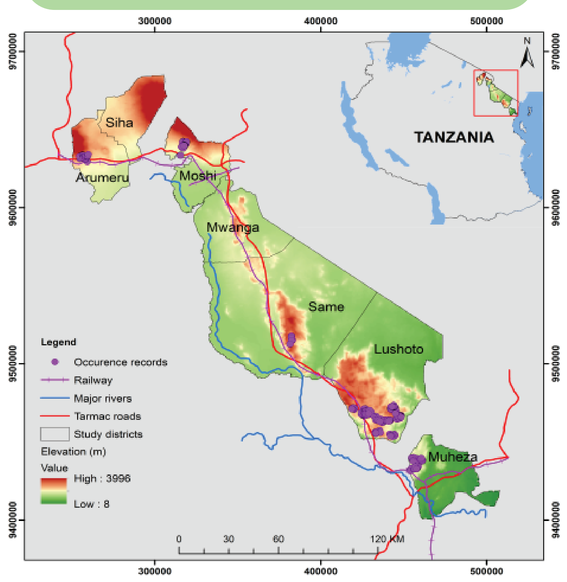

Fig. 1: Map of study area Northern Tanzania -Arumeru, Same, Lushoto and Muheza districts

Table 1: Ethnobotanical knowledge on uses of oyster nut seeds in the study areas, (N=346)

Uses	Frequency	% of responses
Cooking	324	21
Lactation	281	18
Snacks	249	16
Conservation	234	15
Medicine/herbs	200	13
Culture	131	9
Ornamental	116	8
Total	**1535**	**100**

Table 2: Nutritional composition of oyster nuts across study area

	Proximate analysis (%)					
Region	**Ash**	**Fat**	**Protein**	**Moisture**	**Carbohydrates**	**Energy (kcal)**
Arusha (A1)	**3.0**	63.3	23.1	**3.5**	**7.080**	690.2
Kilimanjaro (K1)	2.8	66.4	22.8	3.1	4.811	707.9
Tanga (T1)	2.3	**68.1**	**25.3**	2.9	1.415	**719.2**

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Table 3 : Hard wood tree species preferred to support oyster nuts

Tree species	Family	Frequency	Relative frequency (%)	Diameter at breast height (cm)		
				Min	Max	Average
Albizia schimperiana	Fabaceae	110	39	28	121	40
Persea Americana	Lauraceae	40	14	11	90	36
Croton macrostaychs	Euphorbiaceae	24	9	21	43	38
Artocarpus heterophyllus	Moraceae	23	8	21	62	38
Cordia Africana	Boraginaceae	23	8	15	68	37
Terminalia superba	Combretaceae	16	6	7	44	19
Ficus sur	Moraceae	14	5	39	97	62
Rauvolfia caffra	Apocynaceae	12	4	15	51	35
Ficus thonningii	Moraceae	11	4	20	96	60
Mangifera indica	Anacardiaceae	7	3	22	89	52
Total		280	100			

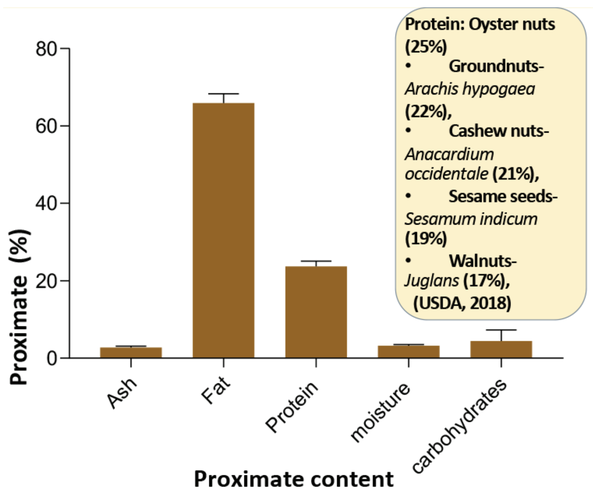


Fig. 2: Proximate content across the study area

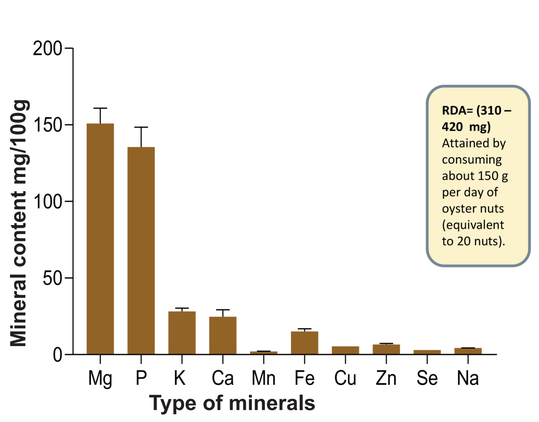


Fig. 3: Minerals found in oyster nuts across the study area whereas, Mg=Magnesium; P=Phosphorus; K=Potassium; Mn=Manganese; Fe=Iron; Cu=Copper; Zn=Zinc; Se=Selenium; Na=Sodium and RDA=Recommended Dietary Allowances

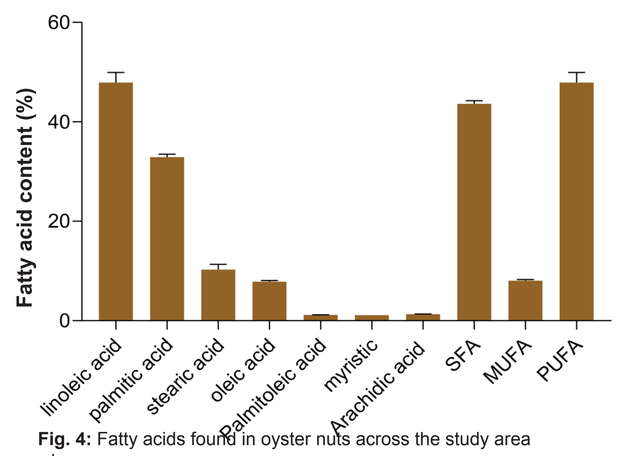
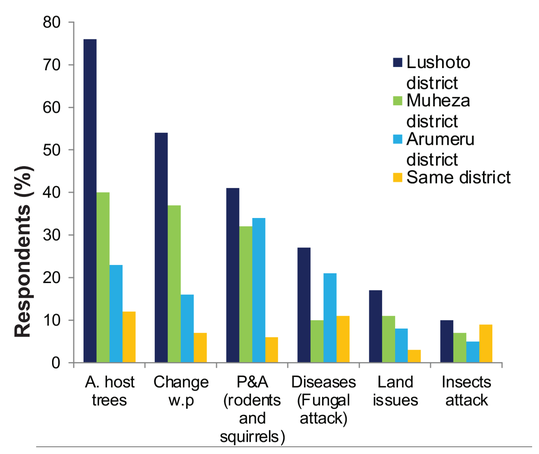


Fig. 4: Fatty acids found in oyster nuts across the study area whereas,
SFA=Saturated fatty acid; MUFA=Monounsaturated fatty acids and PUFA=Polyunsaturated fatty acids (Omega 3 and Omega 6)



Reasons for neglect

> Presence of variety of cultivated oilseeds and cooking oils to choose from;

> Absence of hard wood tree species;

> Loss of its population;

> Inability to distinguish sex and the predominance of male plant in natural populations discourage cultivation of the species;

> Loss of the indigenous knowledge on cultivation and preparation of oyster nuts (due to generation gap);

> Reliable access to markets (to sell oyster nuts);

> Absent of value-addition processing opportunities (post harvesting);

> Lack of alternative propagation methods- vine cuttings.

Conclusion

Oyster nuts are highly nutritious oilseeds containing particularly high Omega 6 fatty acids, oleic acid, protein and magnesium

Oysternuts can be an additional source of income generation as well as for agricultural bio-diversification if the importance of optimizing growing conditions is considered.

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