



Analysis of Medicinal uses and Marketing of Desert Date (*Balanite Aegyptiaca* del.) in Kaduna North L.G.A., Kaduna State

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ABSTRACT

This study examines the medicinal uses and marketing of desert date in Kaduna North Local Government Area of Kaduna State. A total of one hundred marketers were randomly selected among the traders in the markets located in the study area. Information on the traditional uses of the plant was equally gathered from the respondents using a well structured questionnaire with personal interview. Eighty-eight (88%) of the total questionnaires were successfully utilized for the analysis. Economic tools such as Gross Margin (GM) and Marketing Efficiency (ME) were used to determine the profitability of *Balanite aegyptiaca* (desert date) marketing while the socio-economic characteristics of the traders and uses of the plant were analysed using simple descriptive statistics such as frequency and percentage. The business is male-dominant and the uses of the plant are basically for medicinal purposes in the treatment of ailment such as schistosomiasis, dizziness/body weakness, stomach upset/pain, ulcer, and as food. Plant parts used include the leaf, root, seed and fruit. Gross Marketing Margin was calculated to be ₦140, 856.40, Net Marketing Margin was ₦137, 256.94 while the Marketing Efficiency (ME) was calculated to be 39.13%.

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Introduction

Balanites aegyptiaca which is also known as 'Desert date' in English is a member of the family Zygophyllaceae. It is one of the most common but neglected wild plant species of the dry land areas of Africa and South Asia (Heuzé and Tran, 2012). It is believed to be indigenous to all dry lands South of the Sahara. It can be found in many habitats, tolerating a wide variety of soil types from sand to heavy clay and climatic moisture levels. It has a wide ecological distribution though mainly found on level alluvial sites with deep sandy loam and free access to water.

The plant is a multi-branched spiny shrub or tree which could be up to 10m tall. Its crown is spherical and in one or several distinct masses while the trunk is short and often branching from near the base.

The branches are armed with stout yellow or green thorns up to 8 cm long. The bark is dark brown to grey and deeply fissured. Its Leaves are with two separate obovate leaflets, asymmetric, 2.5 to 6 cm long and are bright green, leathery, with fine hairs when young. It flowers in fascicles in the leaf axils, and are fragrant, yellowish-green. The flowers are small, inconspicuous, hermaphroditic, and pollinated by insects. The tree begins to flower and fruit at 5 to 7 years of age and maximum seed production occurs when the trees are at age 15 to 25 (Heuzé and Tran, 2012).

Its fruit is a rather long, narrow drupe of 2.5 to 7 cm long and 1.5 to 4 cm in diameter. Young fruits are green and tormentose, turning yellow and glabrous when mature. The pulp is bitter-sweet and edible. The seed is the pyrene (stone) of 1.5 to 3 cm long, light brown, fibrous, and extremely hard. It makes up 50 to 60% of the fruit. There are 500 to 1 500 dry, clean seeds per kg. The seeds are dispersed by ingestion by birds and animals.

Medicinal Uses

The medicinal uses have been reported by Chothani, and Vaghasiya, (2011). The report indicated that the seed is used as expectorant, antibacterial, and antifungal. Fruit is used in whooping cough, also in leucoderma and other skin diseases. Bark is used as spasmolytic. They further reported that the root extracts have proved 'slightly effective' against experimental malaria. In Kenya, a root infusion is used as an emetic. In asthma, about 10 gm of seed powder is taken with glass of water in the morning for 10 days. Tablets are prepared from roots mixed with 'Hing' powder (*Ferula asafoetida*) and *Piper betle* leaf. The tablets are taken once with water for 9 days soon after menstruation to avoid unwanted pregnancy. In Egyptian folk medicine, the fruits are used as an oral hypoglycemic and an anti-diabetic; an aqueous extract of the fruit mesocarp is used in Sudanese folk medicine in the treatment of jaundice. The fresh leaf of the plant *Acalypha* is pounded with little quantity of roots of *B. aegyptiaca* and *Cissus quadrangularis*, and then soaked in water for an hour or two. It is decanted and administered intranasal and orally. Latex of the plant is used in epilepsy, administered through intranasal route. Its twig is used as tooth brush. Fruits are used to treat dysentery and constipation. The seed oil is used to treat tumours and wounds. It is also used as laxative and in the treatment of hemorrhoid, stomach aches, jaundice, yellow fever, syphilis and epilepsy (Orwa, et. al. 2009). The fruit is used to treat liver disease and as a purgative, and sucked by school children as a confectionary in some countries. The bark is used in the treatment of syphilis, round worm infections, and as a fish poison. The aqueous leaf extract and saponins isolated from its kernel cakes have antibacterial activity. Seeds are used as anthelmintic and

purgative. Ground seeds are given to camels to cure impaction and colic.

In East Africa, it is widely used as anthelmintic. Root is used in various folk medicines for the treatment of abdominal pain and as purgative, while the bark is employed as a fish poison and also as a remedy for malaria and syphilis. The root, bark, kernel, and fruit have been shown to be lethal to molluscs. In Sudanese folk medicine, it is used to treat jaundice. Its anti-malarial and molluscicidal activity is well studied. In-vitro anti-plasmodium test of the dichloromethane and methanol extract of stem bark of the plant showed anti-malaria activity.

In Senegal, Nigeria, Morocco, and Ethiopia, *B. aegyptiaca* is taken as a purgative for colic and stomach ache. In Chad, fresh twigs are put on the fire in order to keep insects away. For intestinal worm, the fruits are dried and mashed in millet porridge and eaten. In Libya and Eritrea, the leaves are used for cleaning infected wounds. In Sudan and Chad, the bark of *B. aegyptiaca* is component of soap. The use of the kernel oil for treatment of wounds has been reported from Nigeria. For contraception, in Nigeria, a mixture of dried leaves powder of *B. aegyptiaca* and *Ricinus communis* in water and in Somalia, the bark of root is crushed and mixed with two glasses of water, which is then filtered. This preparation is repeated for three days and one glass is drunk three times daily for three days.

The fleshy pulp of both unripe and ripe fruit is edible and eaten dried or fresh. The fruit is processed into a drink and sweetmeats in Ghana, alcoholic liquor in Nigeria, a soup ingredient in Sudan. Young leaves and tender shoots are used as a vegetables, which is boiled, pounded, then fried or fat added to prepare it. The flowers are a supplementary food in West Africa and an ingredient of 'dawa dawa' flavouring in Nigeria. Flowers are sucked to obtain nectar. The fresh and dried leaves, fruit and sprouts are all eaten by livestock. As shown in an experiment in Burkina Faso, *B. aegyptiaca* contributed up to 38% of the dry-matter intake of goats in the dry season. Kernel meal, the residue remaining after oil extraction, is widely used in Senegal, Sudan and Uganda as a stock feed. The tree is lopped for fodder in India fuel. The wood is good firewood; it produces considerable heat and very little smoke, making it particularly suitable for indoor use. It produces high-quality charcoal, and it has been suggested that the nutshell is suitable for industrial activated charcoal. The calorific value is estimated at 4600 kcal/kg (Chothani, and Vaghasiya, 2011).

Extensive literature survey has proven that 'desert date' has a long history of traditional uses (Orwa *et. al.* 2009). Bark, fruits, seeds, seed oil, and leaves of this plant are widely used in folk medicine. In recent years, emphasis of research has been on the utilization of Non Timber Forest Products (NTFPs) that have long and proven history of treating various ailments (Chothani, and Vaghasiya, 2011; Orwa *et. al.* 2009). However, there is dearth of information on the plant and when available, it is unreliable (Nair, 1994).

In view of the above highlighted ethno-botanical potentials of desert date, it is imperative to examine the contribution of the plant with regards to income generation to the people in the study area. The study also further seeks to establish the people's awareness and understanding of the usefulness. "There is little reason to expect natural resources development if people are indifferent to the product or services which such resource can contribute" (Jhingan, 1997).

This study is therefore conducted to examine the socio-economic characteristics of the marketers, determine the profitability, the marketing efficiency and the medicinal uses of the plant in the study area.

Methodology

The Study Area

Kaduna North Local Government Area lies between Latitude 10°35' N and 10°40' N and Longitude 6°E and 9°E of the prime meridian. It has a population of 364,573 people (NPC, 2006). It is bounded in the North by Igabi Local Government and in the South by Kaduna South Local Government Area. The main occupation of the people include; farming, trading while others are artisans and civil servants. The markets in the study area are; Badarawa, Ungwan Shanu, Central market, Abakpa, Ungwan Dosa and Kawo market.

Data collection and Sampling Technique

Data for this study were collected from primary source with the aid of a well structured questionnaire which elicits information on the socio-economic characteristics, marketing and the various medicinal uses of the plant. Two-stage sampling technique was adopted in this study. The first stage involves the purposive selection of six main markets in the study area due to abundant availability of the products in the markets. A total of one hundred (100) questionnaires were randomly distributed among the respondents within the markets in the Local Government Area out of which eighty-eight (88) were retrieved and utilized for the analysis.

Data Analysis

The data collected was analysed using descriptive statistics while budgetary analysis such as gross margin and marketing efficiency was also used. The descriptive statistics include the use of frequency and percentages while the gross margin according to Olukosi *et. al.* 2005 can be stated as:

$$GM = TR - TMC$$

Where, GM = Gross Margin

TR = Total Revenue

TMC = Total Marketing Cost

Marketing Efficiency

This refers to the maximization of the rate of output in marketing (Olukosi *et. al.* 2005). The higher the ratio, the higher the marketing efficiency;

Marketing Efficiency (ME) = Value added by marketing / Cost of marketing X 100

Results and Discussion

Table 1. Socio-economic Characteristics of the Traders

Variables	Frequency	Percentage
Market Location		
Badarawa	9	10.22
Ungwan Shanu	13	14.77
Central market	18	20.46
Abakpa	14	15.91
Ungwan Dosa	14	15.91
Kawo market	20	22.73
Gender		
Male	82	93.18
Female	6	6.82
Household size		
<6	45	51.14
6 – 10	21	23.86
11 – 15	10	11.36
>15	12	13.64
Age (Years)		
≤30	24	27.27
31 – 40	33	37.50
41 – 50	12	13.64
51 – 60	8	9.09
>60	11	12.50
Educational Status		
No Certificate	33	37.50
Primary	6	6.82
Secondary	5	5.68
Quaranic	44	50.00
Experience (Years)		
<10	4	4.55
11 – 20	9	10.22
21 – 30	28	31.82
≥31	47	53.41
Product Sources		
Kaduna	53	60.25
Kano	25	28.41
Borno	7	7.95
Jigawa	3	3.41

Source: Field Survey (2013).

Table 2. Respondent Knowledge of the Plant Medicinal Uses

Variable	Frequency	Percentages
Bilharzia (Schistosomiasis)	79	89.77
Dizziness/body weakness	68	77.27
Typhoid fever	15	17.05
Malaria fever	23	26.14
Stomach upset/pain	57	64.77
Ulcer	46	52.27
Hypertension	32	36.36
Food	83	94.31
Total	403*	

*Multiple Responses

Source: Field Survey (2013).

Table 3. Estimated Marketing Margin of the Sampled Traders according to Plant parts

Items	Quantity/Kg/Annum	Price/Kg	Value (₦)/Annum
Sales			
Root	636	21.00	13,356.00
Bark	84	25.00	2,100.00
Fruit	2240	108.00	241,920.00
Palm leaf	48	14.50	696.00
Total Selling Price			258,072.00
Costs			
Root	636	12.60	8,013.60
Bark	84	10.50	882.00
Fruit	2240	48.25	108,080.00
Palm leaf	48	5.00	240.00
Total Cost Price			117,215.60

Source: Field Survey (2013).

Table 4. Estimated Gross Margin and Marketing Efficiency of the Sampled Traders

Items	Value (₦)/Annum	Percentage (%)
Gross Marketing Margin	140,856.40	100.00
Storage	336.00	0.24
Transport	2,221.00	1.58
Packaging	360.27	0.26
Labour	682.19	0.48
Total Marketing Cost	3599.46	2.56
Net Marketing Margin	137,256.94	97.44
Marketing Efficiency (ME) %		39.13

Source: Field Survey (2013).

Table 1 shows the socio-economic characteristics of the respondents in the study area. The markets where the traders were sampled include: Kawo (22.73%), Central Market (20.36%), Abakpa and Ungwan Dosa (15.91% each), Ungwan Shanu (14.77%) and Badarawa (10.22%). The traders were predominantly male (93.18%). This is can be largely attributed to the prevailing culture of male dominance in merchandise in the study area. The household size also indicates that 51.14% of the respondents had a family size that is less than six (6) people while the remaining (48.86%) respondents had a family size of six and above. Contrary to expectation of large family size in the northern part of Nigeria the respondents reveals a neither large nor small household size which can be attributed to the cosmopolitan nature of the area. Most (78.41%) of the respondents are still in their youthful age of less than or equal to fifty years old, thereby indicating that majority of the traders were in their productive years. Only few (12.50%) of the respondents acquired western education, this could be attributed to their involvement with the trade. Years of experience reveals that 10.22% of the traders had been in the business for between 11 - 20years while 84.24% of the respondents had been in the business for more than 20years. This shows that majority of the

traders were knowledgeable in the enterprise. The sources of the products show that most (60.25%) of the products were sourced for in Kaduna this may be as a result of the availability and proximity of the plant to the traders. Other sources of the products as stated by the traders were: Kano (28.40%), Borno (7.95%) and Jigawa (3.41%). Table 2 indicates that the respondents are quite knowledgeable in the medicinal usage of the plant. The uses include the treatment of various ailments such as schistosomiasis (89.77%), dizziness/body weakness, stomach upset/pain (64.77%), Ulcer (52.27%), Hypertension (36.36%), Malaria fever (26.14%) and Typhoid (17.05%). Almost (94.31%) all the traders agreed that the plant is used as food.

Table 3 revealed the plant parts sold by the traders, the quantity per kilogram, the price per kilogram and the marketing margin per annum. Most of the revenue accruing to the traders was generated from the sales of desert date fruits while other sources of revenue were from the sales of other plant parts: roots, barks and leaves. The Total Cost price for these products was 117,215.60 while the Total Selling Price was 258,072.00 hence the Gross Marketing Margin was calculated to be 140,856.40. The Marketing Cost was 3599.46 while the Net Marketing Margin was 137,256.94 and the Marketing Efficiency (ME) was calculated to be 39.13%.

Conclusion and Recommendation

The study has shown that the respondents' are quite versatile in the knowledge of the uses of the plant and marketing of various parts of the plant serves as a source of income to the people. The business is male-dominant and the uses of the plant are basically for medicinal purposes in the treatment of ailment such as Schistosomiasis, Dizziness/body weakness, Stomach upset/pain, Ulcer, and as food. Plant parts used include the leaf, root, seed and fruit. Gross Marketing Margin was calculated to be ₦140, 856.40, Net Marketing Margin was ₦137, 256.94. The results here indicate that desert date marketing is profit-oriented and the marketers are efficient (39.13%) in their trade. It is therefore recommended that programmes to increase the abundance of the plant through massive planting be encouraged by the government and various stakeholders.

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