

## Socio Economic Importance and Ethnobotanical Potentials of *Parkia biglobosa* (Jacq.) R.Br. ex G.Don

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**Abstract.** *Parkia biglobosa* (PB) (Jacq.) R.Br. ex G.Don is a multipurpose tree species that has been recognized as potential raw materials for local soup and condiment as well as a very good source of plant protein. This work assessed the socio economic importance and the ethno-botanical potentials of PB among the hawkers in Ode-Olo market, Ibadan North Local Government area of Oyo State, Nigeria. Semi-structured questionnaires were used to obtain relevant information from 109 Locust bean sellers. The demographic distribution of the respondents showed 100% females. Substantial percentage (68.81%) of the respondents were above 51years with Primary education (43.12%) as their highest form of education. Most (61.47%) respondents had between 5 and 10 household sizes while 38.53% of them had less than 5. Many parts of PB are used in the treatments of various ailments such as Arterial blood pressure, Asthma, Diabetes, Diarrhoea, Eye defects, Ulcer amongst others.

PB provides job opportunities (Traders) which enable them fulfill their family responsibilities to train their wards in schools and taking care of domestic expenses. Plantation establishment of PB for large scale production should be encouraged for the potentials.

**Keywords:** Asthma, Ethno medicine, Locust bean, Nutritional benefits.

### 1. Introduction

Forest provides wide range of economic benefits, which can be valued in monetary terms and also provides social functions which are measured and considered among countries depending on their traditions and level of development (Timko *et al.*, 2010). *Parkia biglobosa* (PB) also known as locust bean tree is a woody deciduous tree in the family Mimosaceae (Leguminosae-Mimosoideae). It is

found in wide range environments of Africa and it is primarily grown for its pods that contain both sweet pulp and valuable seeds (Janick, 2008). The crushing and fermenting of these seeds constitutes an important economic activity. The tree is a fire-resistant helophyte characterized by a thick dark gray-brown bark. The pods, commonly referred to as locust beans, are pink in the beginning and turn dark brown when fully mature with each pod containing up to 30 seeds (Orwa *et al.*, 2009).. PB is referred to as African locust bean or *néré* (Janick, 2008) and locally called Iru (Yoruba), Dawadawa (Hausa) and Ogiri or okpi (Igbo) in Nigeria (NRC,2006). PB seeds have been identified as a typical example of non - wood forest product (FAO, 2000).

Various parts of the locust bean tree are used for medicinal purposes (Ntui *et al.*, 2012). The bark, roots, leaves, flowers, fruits and seeds are commonly used in traditional African medicine to treat wide diversity of complaints, both internally and externally, sometimes in combination with other medicinal plants. The bark is most widely used for medicinal values, followed by the leaves. Medicinal applications include the treatment of parasitic infections, circulatory system disorders, such as arterial hypertension, respiratory system disorders, digestive system problems and skin diseases (Abioye *et al.*, 2013). In veterinary medicine, root decoction is used to treat coccidiosis in poultry. Green pods are crushed and added to rivers to kill fishes. Adetutu *et al.*, 2011 also elucidated that it was one of the two plants listed to having real wound healing properties in Southwest Nigeria, which significantly influenced the proliferation of dermal fibroblast. In a survey conducted in Guinea on the use of plants as anti-malarial, revealed PB as one of most successfully used (Traore *et al.*, 2013). Abioye *et al.*, 2013 established that, the plant bark compared

favourably with streptomycin, making it a potential source of compound used in the management of bacterial infections.

Generally, Women are wholly responsible for the sale of fermented seeds (dawadawa) even though both men and women are equally responsible for the sale of dry seeds (Teklehaimanot, 2004). Economically, African locust bean tree provides income and employment to many household members particularly women, who are involved in processing and marketing of the tree products (Breman and Kessler, 1995). Ecologically, the tree played a vital role in nutrients recycling and erosion control. As an integral component in traditional farming system in Africa and Nigeria, the trees acts as buffer against the effect of strong wind or water runoff that usually causes damage to the crops and soil in the area, also fixes Nitrogen in the soil thereby enriching the soil nutrients content (Tee *et al.*, 2009). The species is widely used in North Central Nigeria as an agro forestry or land management species (Olabanke, 2005). In lieu of the importance of this species, this study aimed at assessing the socio economic importance and the ethno-botanical potentials of PB Hawkers in Ode-Olo market, Ibadan North Local Government area of Oyo State, Nigeria.

## 2. Methodology

Ode – Olo is a traditional local community in Ibadan, Southwestern Nigeria. It lies on the latitude  $3^{\circ} 55'07.39639''N$  and longitude  $3^{\circ} 19'667'' E$ , at an altitude of 230m with the rainfall pattern ranging from 1,300mm – 1,500mm. The average temperature is about  $37.2^{\circ}C$ . The average range of relative humidity is about 75 – 100 %. Ode-Olo was purposively selected for this study because of concentration of locust bean marketers in the area. The population of the area for 1991 and 1996 was obtained from the National population commission of Oyo state and a projection of 2017 (Adelekan, 2016) was made. Population size for the area was further computed using the formula  $P_o = P_e e^{rt}$ ----- equation (1)

Where:  $P_n$  = Final population,

$P_o$  = Initial population,

e = exponential.

r = growth rate (3.2%),

t = time internal (x – 1996) years, t = 21 years

The total population for 2017 was 4,346. However, 2.5% sampling intensity adopted by Diaw *et al.*, 2002 was used to select respondents for this study. Diaw *et al.*, 2002 indicated that where the population is less than 500; 10% sampling intensity should be adopted, population above 500 but less than 1000 (i.e 500-1000); 5% sampling intensity will be adopted while population above 1000; 2.5% sampling intensity should be used. Hence, a total of 109 respondents were selected for this study representing 2.5% of the population.

### 2.1 Data collection and Analysis

Primary and Secondary data were used for this research. The primary data was collected with the aid of semi – structured questionnaires administered via unstructured interview as most of the respondents were illiterates. The questionnaire was designed to assess the socio-economic characteristics of the respondents such as gender, age, marital status, household size, and educational status while secondary data were collected from relevant literatures to supplement and support the primary data.

The result was analyzed using Chi square and descriptive statistics such as frequency table, percentage and graphical representation.

## 3. Results and Discussion

The demographic information of the respondents in the study area was shown in Table 1. Results revealed that majority (68.81%) of the respondents were between the age ranges of 51 years and above while the least percentage (31.19%) of the respondents were between the ages of 41-50. It was revealed that 100% of the respondents were females, this is an indication that the male folks source for alternative means of sustaining their homes. This is in accordance with Alabi *et al.*, (2004) who reported that a higher percentage of women are involved in trade than men. This also corroborates Teklehaimanot, (2004) that women were wholly responsible for the sale of fermented seeds. The findings also show that 59.63% of the respondents were married while 40.37% of the respondents were widowed.

It was also observed that 43.12% of the respondents had primary education while 56.88% of the respondents had no formal education.

**Table 1:** Demographic distribution of users and marketers of African locust bean in Ode-olo, Ibadan, Nigeria

Demographic Information	Frequency	Percentage
<b>Age</b>		
41-50	34	31.19
Above 51	75	68.81
<b>Total</b>	<b>109</b>	<b>100</b>
<b>Gender</b>		
Male	0	0.00
Female	109	100.00
<b>Marital status</b>		
Married	65	59.63
Widowed	44	40.37
<b>Total</b>	<b>109</b>	<b>100</b>
<b>Educational Status</b>		
No Formal Education	62	56.88
Primary	47	43.12
<b>Total</b>	<b>109</b>	<b>100</b>
<b>Household Size</b>		
<5	42	38.53
5-10	67	61.47
<b>Total</b>	<b>109</b>	<b>100</b>

The list of the ailments that PB is used to cure, the parts used, the method of preparation and the method of application locally is shown in Table 2. It was revealed that, PB is majorly used to clear eyes for brighter vision. This corroborated the work of Olabanke (2015), which says locust bean promotes good sight and reduces the odds of hypertension and diseases like stroke and diabetes. Rafiu and Sonibare (2016) also reported the use of PB bark for healing wound in Ibadan metropolis. Most of the respondents inherits the usage from their parents, friends and relations, it is used for domestic consumption and also serves as a source of employment.

**Table 2:** Ethno-medicinal value of *Parkia biglobosa* in Ode-olo community, Ibadan

Ailments(counts)*	Part Used	Methods of Preparation	Application
Arterial blood pressure (12)	Bark	Decoction	Drinking
Asthma (1)	Stem/Bark	Cooking	Drinking
Body (4)	Seed	Cooking	Eating
Burns (11)	Bark	Cutting	Chewing
Diabetes (63)	Leaves	Cooking	Drinking
Diarrhoea (14)	Leave/Pod	Grinding	Drinking
Eye defect (86)	Seed	Cooking	Eating
Infection (5)	Leaves/Seed	Cooking	Drinking/Eating
Intestinal disorder (1)	Leaves	Cooking	Drinking
Malaria (27)	Leaves	Cooking/Grinding	Drinking
Skin (4)	Seed	Cooking	Eating
Stroke (1)	Leaves	Cooking	Drinking
Ulcer (20)	Stem/Bark	Cutting	Chewing
Worm (1)	Seed	Cooking	Eating

Note: Number in parenthesis ( ) is frequency of the respondents that mention PB for the ailment

The stage at which PB can be used in combating ailments is shown in Figure 1. Most respondents (82%) affirms that PB could be administered at all levels of ailment. This is also in accordance with Millago-kone *et al.*, (2008) which found that the bark and the seeds of PB can be prescribed for treatment of arterial hypertension and the leaves against piles, burn and cough irrespective of ailment stage.

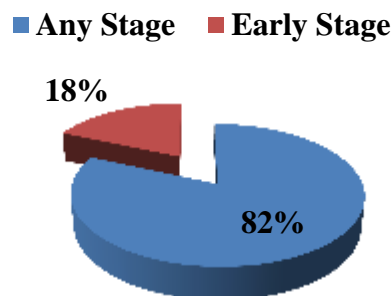


Figure 1: Application of *Parkia biglobosa* at stages of ailments/infection

Table 3 revealed monetary benefits/profits obtained from locust beans trade. Results of Chi square analysis showed ( $\chi^2 = 18.31^*$ ,  $df = 3$  and Sig. level = 0.00. Of the total number of respondents who benefited from locust beans trade, 45.8% had between ₦11, 000 - ₦15, 000 while 50.46% had between ₦5, 000 - ₦10, 000 as monthly profits. This result indicates that over 96% have a successful trade in locust bean.

**Table 3:** Chi-Square of Economic/Financial Benefits of PB sale

Amount Realised from Locust Beans Sells	Observed N	Expected N
5000-10000	55	27.3
11000-15000	50	27.3
16000-20000	2	27.3
Above 20000	2	27.3
<b>Total</b>	<b>109</b>	

Chi-square = 18.31,  $df = 3$  and Sig level. = 0.00 \*Significant ( $P < 0.05$ )

The years of experience of most trader have positive influence on profitability, this is presented in Table 4. The result indicates the years that the respondents have been engaging in locust beans trade with Chi-square = 22.39\*,  $df = 3$  and Sig. level = 0.00. Majority of those engaged in the sale of Locust Bean (LB) have put in at least 6 years into the business with 6-10 years, 11-15 and 15 years' experience with 60.55%, 27.52% and 6.42% respectively.

This result implies experience in term of years of trade tells more about the viability, reliability and profitability of any business. It was also confirmed that locust bean marketing in the study area is a very profitable venture which have been used by some households as a tool for poverty reduction. This is in tandem with the findings of Aiyeloja *et al.*, (2012) that many important Non-Timber Forest Products are traded profitably in local communities of Nigeria.

**Table 4:** Effect of trading experience on Profitability of PB in Ode-olo, Ibadan

Year of Selling Locust Beans	Observed N	Expected N
1-6	6	27.3
6-10	66	27.3
11-15	30	27.3
>15	7	27.3
<b>Total</b>	<b>109</b>	

Chi-square = 22.39,  $df = 3$  and Sig-level = 0.00, \*Significant ( $P < 0.05$ )

#### 4. Conclusion

From the assessment of the socio economic importance of PB at Ode – Olo, Ibadan North Local Government Area of Oyo State, it can be deduced that PB is an economically viable business. For a more profitable business of locust bean, processing and packaging of the product should be improved.

It is recommended that the rural populace should be enlightened, as this will enhance food security and contribute more to poverty reduction programme of the Government. To achieve this, extension agents should be trained and equipped to get to the grassroots to enlighten the rural dwellers. Adult literacy programme should be introduced and intensified for the women so as to broaden their knowledge on value addition for the benefits derived from PB.

Findings revealed that larger percentage of the respondents had no formal education. Therefore, Government should create awareness by organizing seminars to enlighten the traders more about the importance of PB. Plantation establishment of *Parkia* should be encouraged

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