

Ethnobotanical and consumer investigation of *Prosopis africana* seeds in Benin

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Abstract

The objective of this work is to carry out a survey on ethnobotanical knowledge and consumption of *Prosopis africana* seeds in Benin. This survey focused on a population aged between 27 and 90 years. The results revealed that the age groups of [27.37], [37.48], [48.58] and [58.69] years were the most represented with a total of 84.2%. These results also showed that the absolute frequencies of the age of the respondents varied from five (05) to one hundred and forty-four (144) and the relative frequencies varied from 0.8% to 23.20%. This study also showed that the seeds of *Prosopis africana* are less known for its consumption as a foodstuff but the stems, roots and bark are widely used in pharmacopoeia and traditional medicine. The results also showed that the majority of respondents recognized that the leaves, bark and root are used to make herbal tea and the seeds are specially used for the production of mustard (food condiment).

Keywords: Prosopis Africana; Ethnobotany; Consumption; Seeds

1. Introduction

Trees play a central role in the life of rural communities in the Sahelian zone of West Africa. The importance of derivative products and services provided by them has been demonstrated by several research works (Matthias et al., 2000; Diop et al., 2005; Larwanou et al., 2010; Priso et al., 2011). Indeed, *Prosopis africana* is one of these woody species, no part of which escapes domestic uses (Arbonnier, 2000) while it is facing a regeneration problem (Ahoton et al., 2009; Niang-Diop et al. 2010).

Moreover, in Benin, *P. africana* is one of the main species most sought after for charcoal production (Idjigbérou, 2007) which is found only in the Sudano-Guinean and Sudanian zones (Adomou, 2005). The work of Ahoton et al. (2009) have shown that the survival of this species and its population will now have to be based on appropriate exploitation approaches associated with natural and/or assisted regeneration techniques, including precise knowledge of its contribution to the different uses of ligneous. To do this, it is necessary to have reliable data on the different uses made of the species. The general objective of this study is therefore to conduct a survey on ethnobotanical knowledge and consumption of *Prosopis africana* seeds in Benin.

2. Materials and Methods

2.1. Study zone

Eight (08) departments were investigated during this study, namely: the departments of Littoral, Ouémé, Mono, Atlantique, Zou, Collines, Borgou and Atacora. A total of 637 people were surveyed through different villages belonging

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to the targeted departments. In each of these departments, preliminary surveys were carried out on a few randomly sampled individuals.



Figure 1 Map of Benin showing the departments where the surveys were carried out

2.2. Material

Data collection is carried out by a semi-structured survey in the various targeted villages using a survey sheet designed for this purpose (see appendix)

2.3. Method

The attached survey sheet allowed us to assess the different uses made of *P. africana*. The parameters evaluated are age, sex, level of study of the respondents, diet and endogenous knowledge of the *Prosopis africana* plant. Finally, the data collected is processed with the EXCEL software which allowed us to determine the different percentages of the use of the *Prosopis africana* plant and the R software to complete the statistical analysis of the data.

3. Results

3.1. Age group of respondents

Figure 2 and Table 1 respectively present the surveyed age group population and the absolute and relative frequencies of respondents. The results revealed that the age groups of [27.37[, [37.48[, [48.58[and [58.69[years were the most represented with a total of 84.2%. These results also showed that the absolute frequencies of the age of the respondents varied from five (05) to one hundred and forty-four (144) and the relative frequencies varied from 0.8% to 23.20%. Age

between 79 and 90 presented the lowest absolute and relative frequency; the age between 27 and 37 years presented the highest absolute and relative frequency.

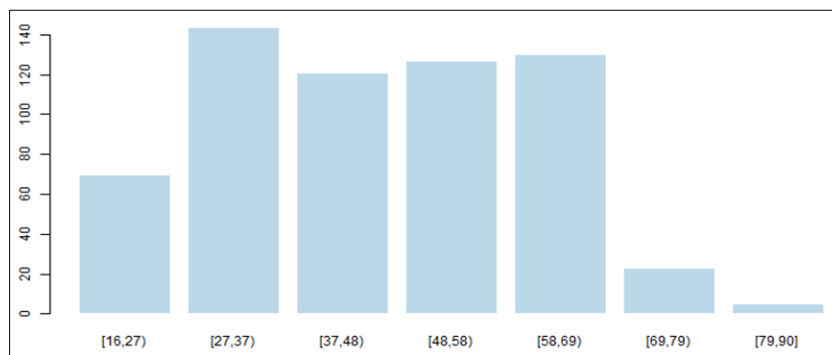


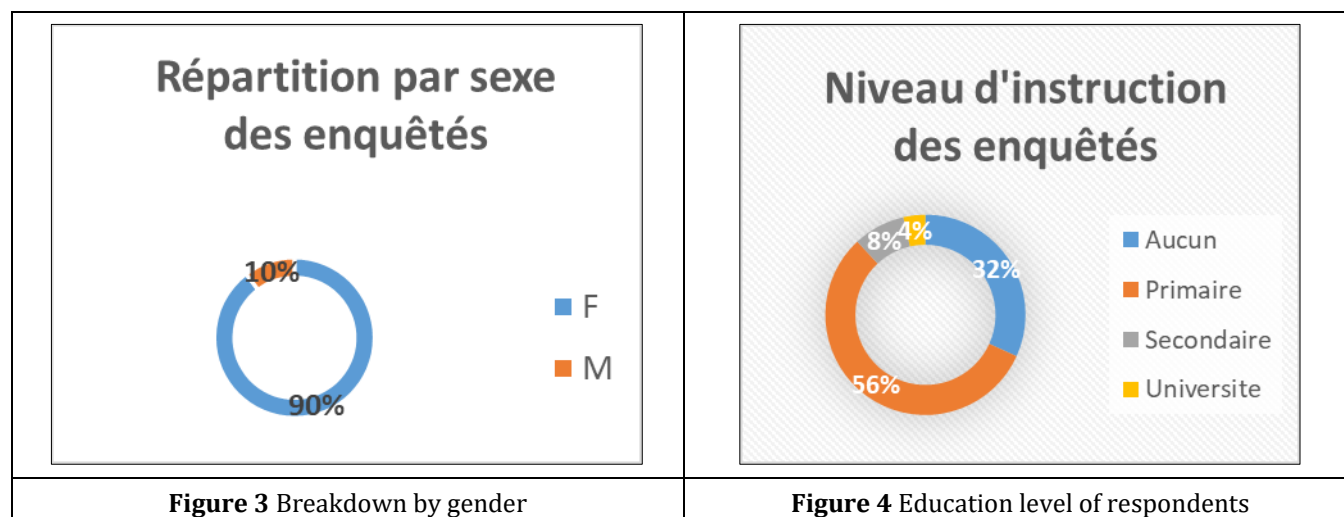
Figure 2 Population of surveyed age group

Table 1 Absolute and relative frequency of respondents

Age	Fréquences (N=)	
	Absolue	Relative (%)
(16,27]	70	11.3
(27,37]	144	23.20
(37,48]	121	19.5
(48,58]	127	20.5
(58,69]	130	21.0
(69,79]	23	3.7
(79,90]	5	0.8

3.2. Level of education and gender of respondents

The distribution according to sex and level of education of the population surveyed are represented respectively by Figures 3 and 4. This study population was composed mainly of women up to 90% and 56% of this population had a level of primary study.



3.3. Knowledge of the use of *Prosopis africana*

Figure 5 showing knowledge of the use of *Prosopis africana* revealed that the number of people with knowledge of *P. africana* is much higher than the number with no knowledge in the eight (08) departments surveyed.

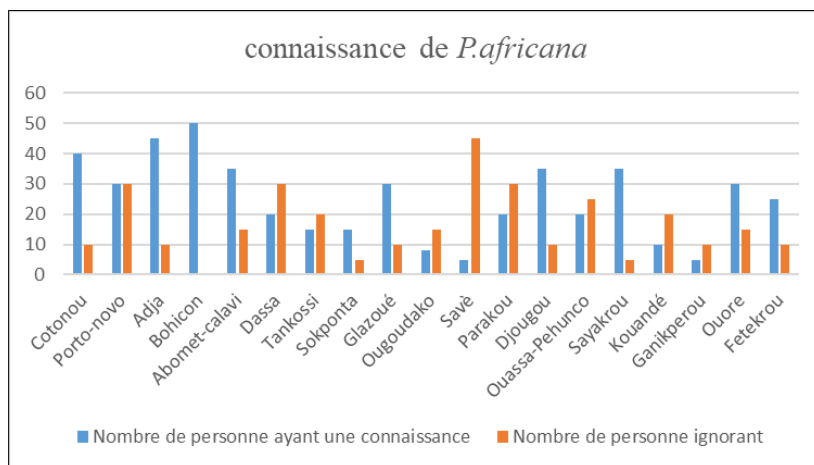


Figure 5 Knowledge of *P. africana*

3.4. Uses of *P. africana*

Figures 6, 7 and 8 show respectively the different uses made of the leaf, bark and root of *P. africana*. These results showed that almost all of the surveyed population recognizes that the leaves, bark and root are used to make herbal tea.

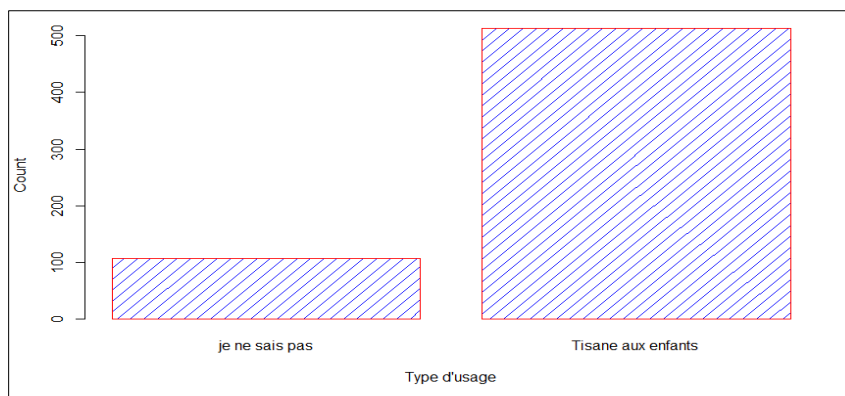


Figure 6 Use of *P. africana* leaves

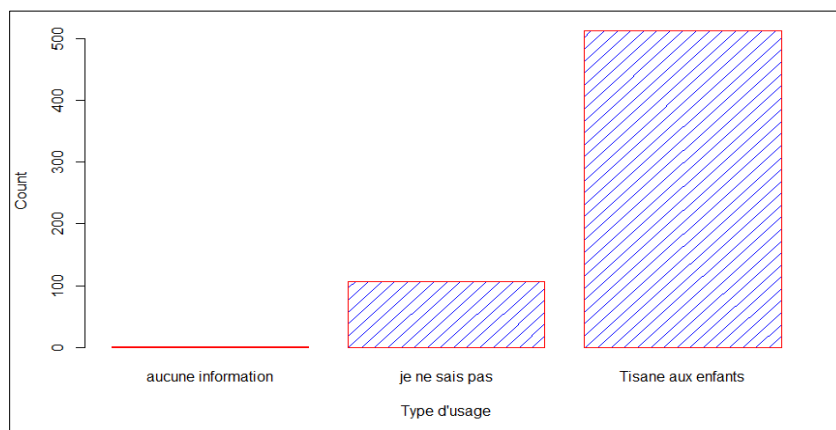


Figure 7 Use of *P. africana* bark

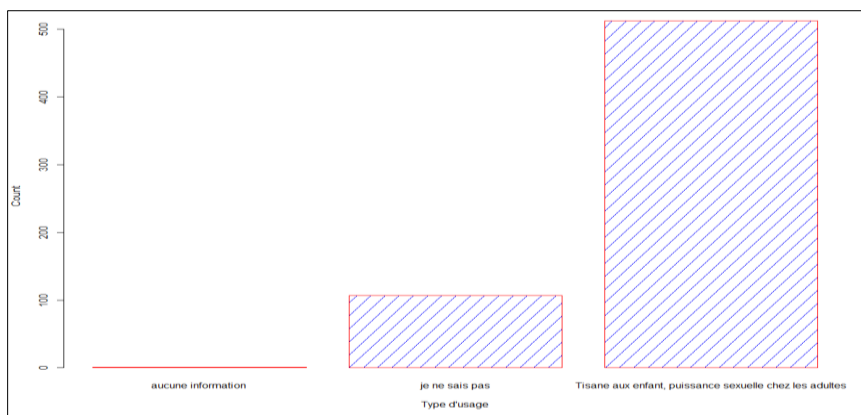


Figure 8 Use of *P. africana* roots

3.5. Use of *P. africana* seeds

The use of *P. africana* seeds presented in Figure 9 showed that the seeds are used to make mustard (a food condiment).

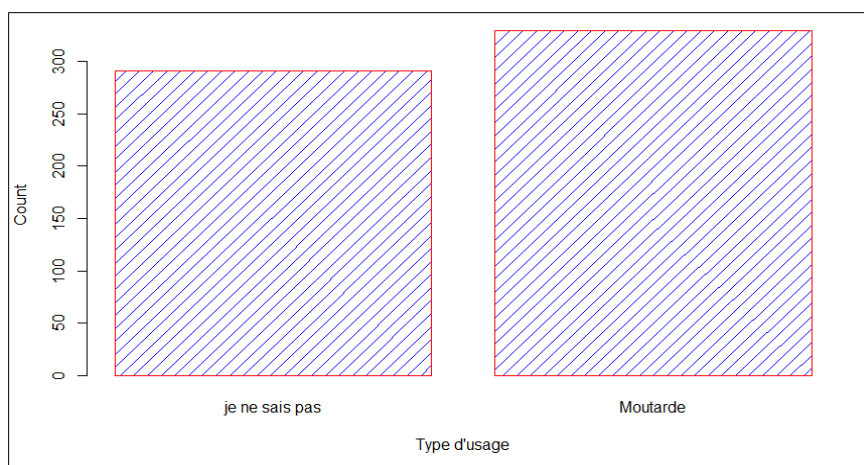


Figure 9 Use of *P. africana* seeds

4. Discussion

The traditional use of medicinal plants is of great socio-economic importance in the majority of West African countries. In a difficult economic context where the majority of households cannot afford drugs from the pharmaceutical industry because of the price, medicinal plants have a major role in traditional health systems (FAO, 2012). This is the case of *P. africana* whose traditional pharmacopoeia is one of the most important uses with a citation frequency of 100%. This particular interest could also be explained by the effectiveness of this species in the treatment of several diseases. The different results from this study presenting the level of knowledge of the use of the different parts of the *Prosopis africana* tree corroborate those obtained by Houétchégnon et al. (2016) who worked on the ethnobotanical, ecological and morphological study of *Prosopis africana* (guill., perrott. and rich.) Taubert in Benin and the impacts of climate change on the species. Moreover, the idea of several authors who are unanimous on the importance of non-timber forest products (NTFPs) in Africa (Hawa, 2007; Abalo et al., 2010; COMIFAC, 2010; Christian et al., 2011) is confirmed in this work.

5. Conclusion

This study allowed us to make an ethnobotanical characterization of *P. africana* in eight departments in Benin. At the end of this study, *P. africana* is known by the surveyed population and used in the field of pharmacopoeia as well as in the field of food. In pharmacopoeia the stem, the root and the bark are utilized for the medicinal cares and the seeds are employed in the human food as condiment. The picking of the fruits of *P. africana* being a difficult and unprofitable

activity compared to the use of seeds of *Parkia biglobosa* in condiments (mustard), it would be very interesting to investigate more on *P. africana* especially on its characterization. and their technological skills.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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