

Ethnobotanical and Dietary Survey on Six Edible Forest Species in Senegal: *Annona senegalensis*, *Lepisanthes senegalensis*, *Borassus aethiopum*, *Diospyros mespiliformis*, *Vitex doniana* and *Syncepalum dulcificum*

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Abstract

Edible species from spontaneous vegetation have, in recent years, attracted renewed interest, particularly in Africa where these forest resources offer significant nutritional and medicinal potential. In this context, an ethnobotanical survey was conducted in three administrative regions of Senegal: Ziguinchor, Kaolack, and Dakar. The study aimed to assess the level of knowledge, identify vernacular names, and document both dietary and traditional medicinal uses of six selected forest species. Findings revealed substantial variability in local knowledge: *Borassus aethiopum* (89.1%) was the most frequently recognized species, followed by *Vitex doniana* (72.2%), *Annona senegalensis* (66.5%), and *Diospyros mespiliformis* (66.1%), whereas *Lepisanthes senegalensis* (27.4%) and especially *Syncepalum dulcificum* (2.2%) were less known. These levels of knowledge were consistent with reported dietary uses, in which fruits were identified as the most consumed plant part (52%). Furthermore, the survey confirmed the traditional importance of these species in the treatment of various ailments.

Keywords: *Annona senegalensis*; *Lepisanthes senegalensis*; *Borassus aethiopum*; *Diospyros mespiliformis*; *Vitex doniana*; *Syncepalum dulcificum*

1. Introduction

Food and nutritional security represents a major global challenge, particularly in regions where poverty and climatic variability limit access to diversified and nutritious diets. In Africa, and more specifically in Senegal, spontaneous vegetation comprises a wide diversity of edible species (Djihounouck et al., 2019), which constitute a valuable food resource. This spontaneous vegetation contributes to dietary diversification and enhances community resilience to food crises (Kweke et al., 2024; Tchatchambe et al., 2025). Beyond their nutritional value, these plants play a central role in traditional knowledge systems, where they are used as functional foods, combining dietary and therapeutic properties (Denisi et al., 2018). Several studies have highlighted the use of various parts of these indigenous species in traditional medicine, with medicinal properties attributed to the bark, leaves, fruits, and roots, which are employed in the treatment of different ailments (Faye, 2018; Arbonnier, 2019). Moreover, recent ethnobotanical surveys underscore the importance of local knowledge in the identification, consumption, and transmission of the nutritional and therapeutic benefits of these spontaneous plants (Benmoussa et al., 2022). However, despite growing interest and a notable increase in their consumption, scientific knowledge on these plants remains limited, emphasizing the need for more in-depth research covering all plant parts (Issoufou et al., 2025). In this context, the present study undertakes an ethnobotanical

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and dietary investigation focused on six fruit-bearing species from spontaneous vegetation: *Annona senegalensis*, *Lepisanthes senegalensis*, *Borassus aethiopum*, *Diospyros mespiliformis*, *Vitex doniana*, and *Syncepalum dulcificum*. The survey was conducted in three regions of Senegal (Ziguinchor, Kaolack, and Dakar) with the objective of generating quantitative data to improve documentation on the uses and potential of these plants in relation to food security and health, as well as to compile their vernacular names in local languages.

2. Materials and Methods

2.1. Materials

2.1.1. Plant material

The study focused on six (6) edible forest plants: *Annona senegalensis*, *Lepisanthes senegalensis*, *Borassus aethiopum*, *Diospyros mespiliformis*, *Vitex doniana*, and *Syncepalum dulcificum*.

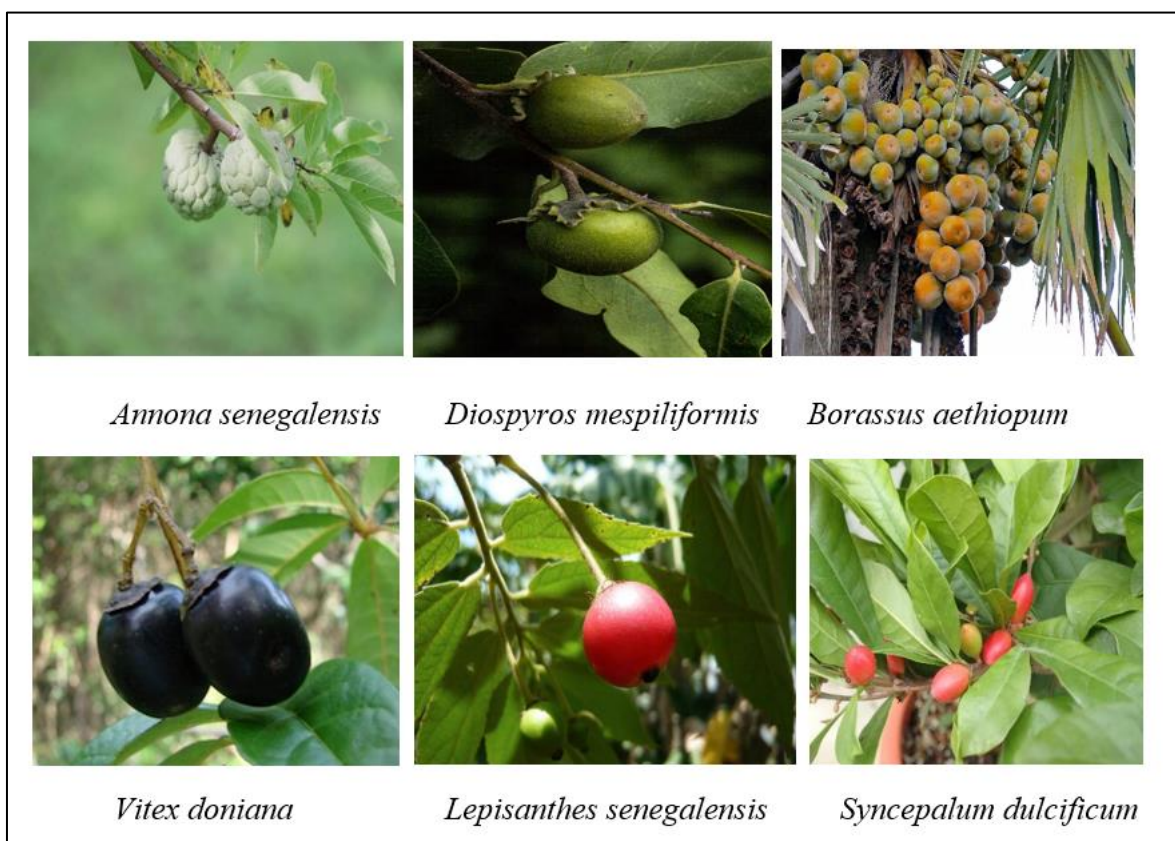


Figure 1 Morphological overview of the six (6) studied species

2.1.2. Study areas

The ethnobotanical survey was conducted in three different regions of Senegal: Dakar, Kaolack, and Ziguinchor. The Dakar region, located at the westernmost tip of the country, is the economic and political center of Senegal. Its geographical coordinates are approximately 14°43'55" N latitude and 17°27'26" W longitude. The Ziguinchor region, the administrative capital of Casamance, lies in the southwestern part of Senegal. It is situated at about 12°36' N latitude and 16°16' W longitude, and is characterized by a more humid climate and rich biodiversity. The Kaolack region, in the west-central part of Senegal, is located between 14°07' N latitude and 16°07' W longitude. It also encompasses significant ecological diversity, including agricultural areas and halophytic ecosystems. The selection of these study areas was based on three main criteria: (i) the ecological availability of plant species, (ii) their socio-economic importance, and (iii) their dietary role for the local population.

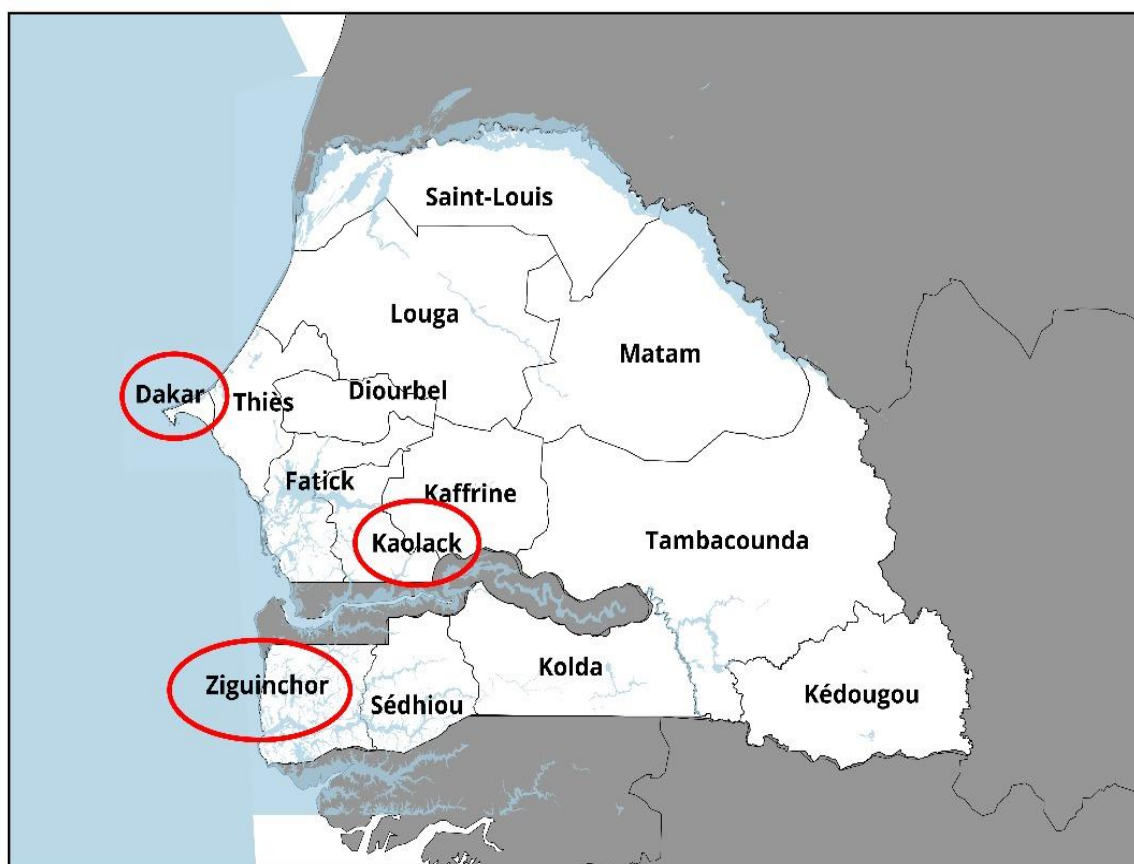


Figure 2 Location of the surveyed areas

2.2. Study methodology

This study was conducted over a period of four months, from November 2024 to February 2025. The surveyed population consisted of individuals aged over 16 years (both men and women) residing in the selected localities at the time of the survey. Data were collected using a structured questionnaire administered through oral interviews. The questionnaire, serving as an interview guide, focused on the profile of the informant (age, sex, ethnic group), dietary habits, traditional therapeutic uses, and the plant parts consumed. A simple random sampling method was used for participant selection. In total, 230 questionnaires were administered during individual interviews, the duration of which varied depending on the availability of respondents and the amount of information provided.

2.3. Data processing

The questionnaire was designed using Microsoft Word. Following data collection, the raw responses were coded and analyzed using Sphinx and Microsoft Excel software.

3. Results

The survey conducted among local populations provided information on respondents' profiles, their level of knowledge, consumption practices, and traditional therapeutic uses of the studied plants.

3.1. Demographic profile of respondents

During the study, individual interviews were conducted with 230 participants across the target regions, including 148 in Dakar, 49 in Kaolack, and 33 in Ziguinchor. Data analysis showed that 32.6% of the respondents were women and 67.4% were men (75 women and 155 men). Participants belonged to eight (8) ethnic groups, with the following distribution: Peulh (37.4%), Wolof (31.3%), Diola (10.9%), Serer (14.8%), Mandinka (3.5%), Soninke (0.4%), Narre (1.3%), and Soussou (0.4%) (Figure 3).

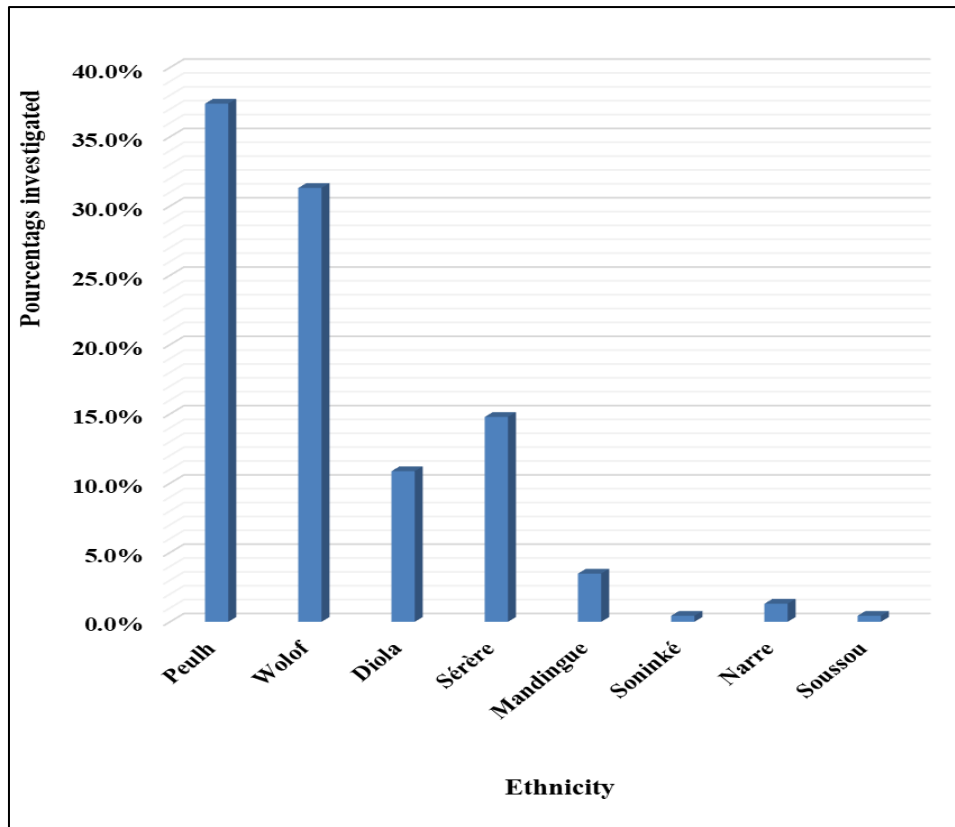


Figure 3 Distribution of respondents by ethnic group

The age range of the surveyed individuals was between 16 years and over 65 years. The modal class corresponded to the interval [25–34] years across the entire population (Figure 4).

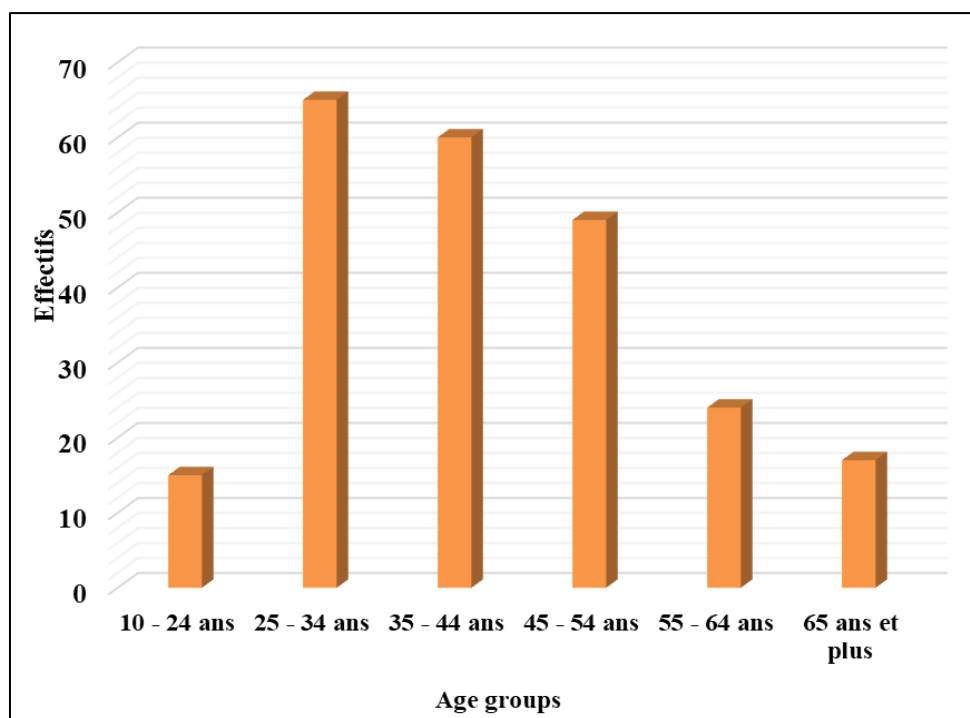


Figure 4 Representation of surveyed age groups

3.2. Social knowledge of plants

Across the three study areas, the level of plant knowledge showed notable variability (Table 1). *Borassus aethiopum* stood out with the highest recognition rate (89.1%), followed by *Vitex doniana* (72.2%), *Annona senegalensis* (66.5%), and *Diospyros mespiliformis* (66.1%). In contrast, *Lepisanthes senegalensis* (27.4%) and particularly *Syncopalum dulcificum* (2.2%) were found to be much less known. In addition to the overall assessment across all regions, the table below presents the distribution of knowledge levels according to each study area.

Table 1 Knowledge of the studied species by study area

Species Areas	<i>Annona senegalensis</i>	<i>Aphania senegalensis</i>	<i>Borassus aethiopum</i>	<i>Diospyros mespiliformis</i>	<i>Vitex doniana</i>	<i>Syncopalum dulcificum</i>
Dakar	75,0%	18,9%	89,9%	68,2%	73,6%	1,4%
Kaolack	18,4%	2,0%	75,5%	79,6%	57,1%	0,0%
Ziguinchor	100,0%	93,9%	100,0%	33,3%	97,0%	9,1%

Furthermore, the age-class analysis revealed that better knowledge of the plants was recorded among respondents aged 25–34, 35–44, and 45–54 years (Figure 5).

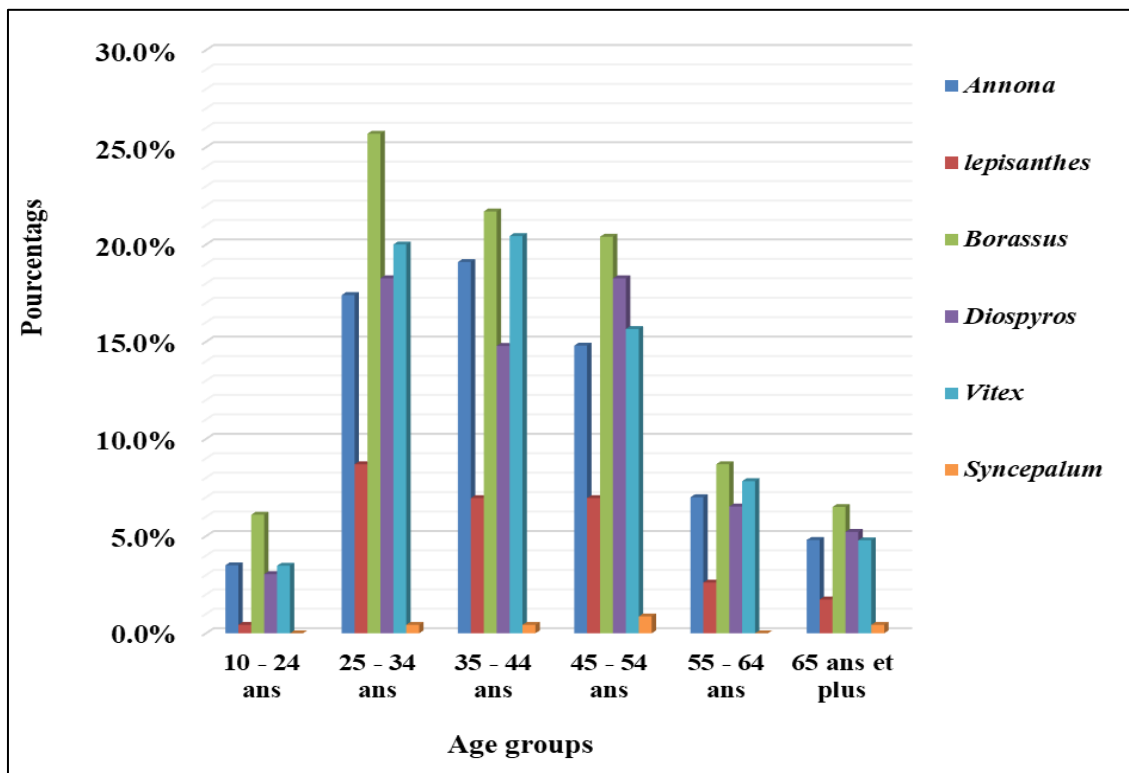


Figure 5 Knowledge level of the studied plants according to age groups

3.3. Dietary use of plants

The results highlighted a clear predominance in the consumption of *Borassus aethiopum* (87.1%), followed, in decreasing order, by *Vitex doniana* (72.2%), *Annona senegalensis* (66.1%), *Diospyros mespiliformis* (62.1%), *Lepisanthes senegalensis* (24.4%), and *Syncopalum dulcificum*, which was very rarely consumed (0.9%). For all these plants, dietary use was primarily focused on the fruits (52%), while the leaves were scarcely utilized (0.9%). Furthermore, the survey reported no consumption of seeds from the studied fruits.

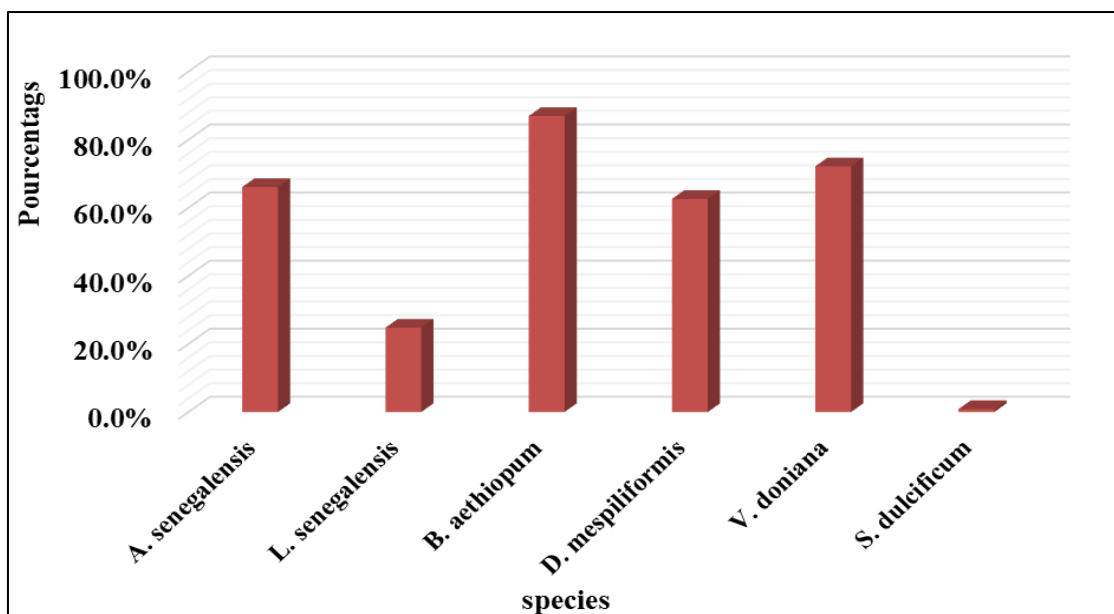


Figure 6 Knowledge level of dietary uses

3.4. Therapeutic uses and vernacular names

The results revealed that therapeutic use varied considerably among the species, ranging from 32.2% for *Annona senegalensis* to 0% for *Syncepalum dulcificum*. The other plants exhibited intermediate values: *Borassus aethiopum* (21.3%), *Vitex doniana* (18.7%), *Lepisanthes senegalensis* (13.9%), and *Diospyros mespiliformis* (2.6%).

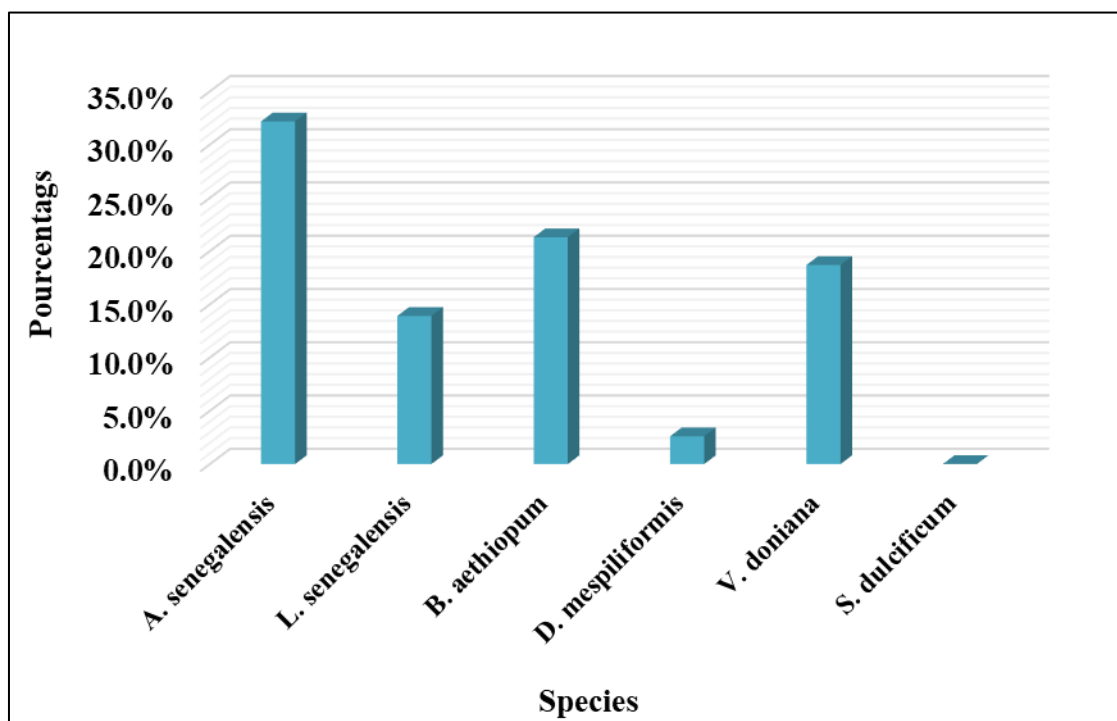


Figure 7 Knowledge level of therapeutic uses

Among the examined species, a significant number are used for therapeutic purposes to treat various ailments, such as sexual weakness, muscle cramps, and fatigue. However, data regarding the specific plant parts used, preparation methods, and routes of administration were not collected.

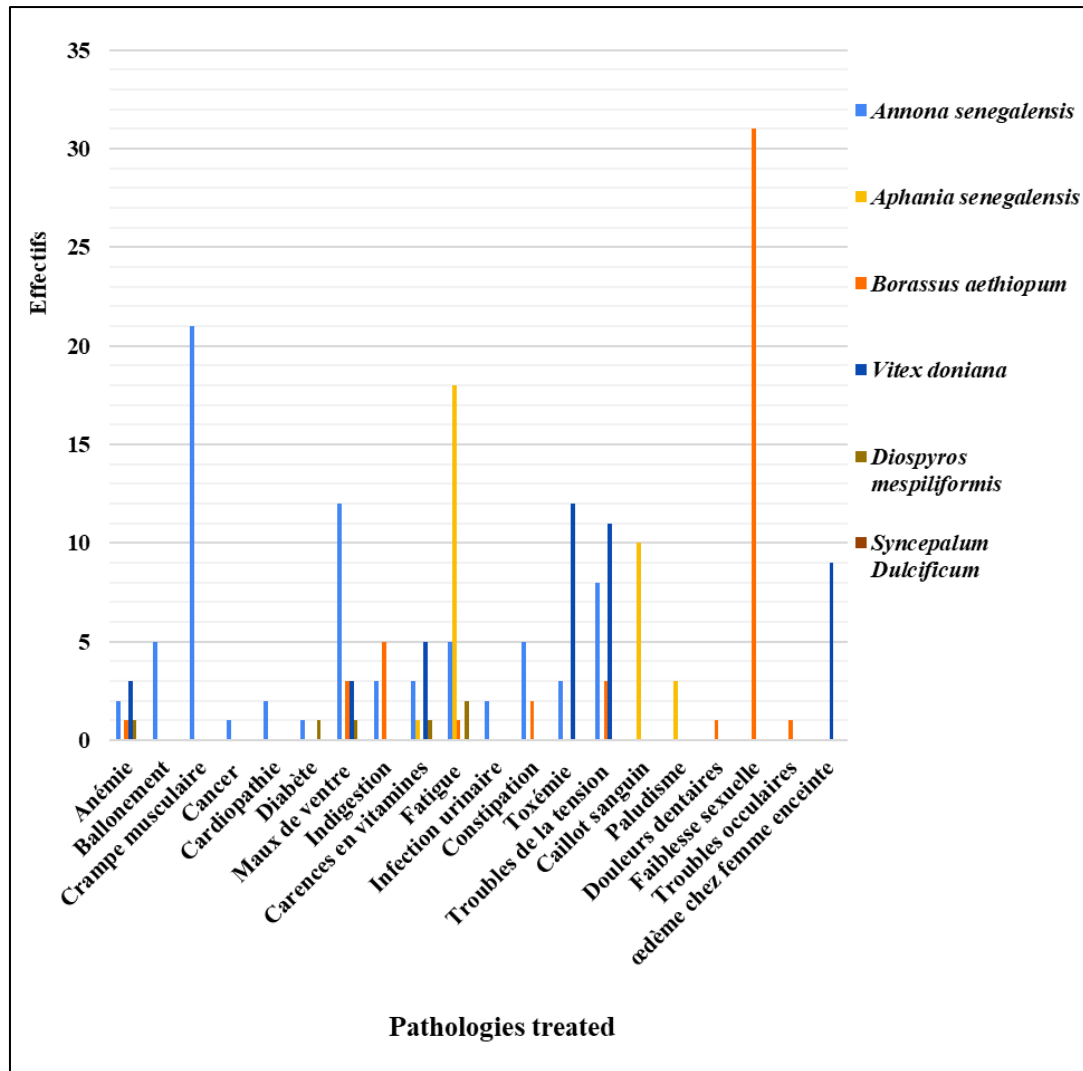


Figure 8 Traditional medicinal uses of the studied plant species

Following the ethnobotanical survey, the names of the selected species were documented (Table III) according to the ethnic groups encountered. Data collected from respondents made it possible to record the vernacular names attributed to these plants across eight (8) ethnic groups. However, the completeness of the data varied depending on the species; notably, for *Syncepalum dulcificum*, which is relatively unknown, no vernacular name could be documented among the respondents.

Table 2 Vernacular nomenclature of the studied plant species

Species/Ethnicity	<i>A. senegalensis</i>	<i>A. senegalensis</i>	<i>B. aethiopum</i>	<i>V. doniana</i>	<i>D. mespiliformis</i>	<i>S. Dulcificum</i>
Peulh	Pomme cannel (19), Doucoumé (4), Fougni (1), Pomondogo (5)	Khéwer (4), Thialébadi / Thialé (5)	Coco (37), Koni (26), Koukounadié (1), Doubé (7), Sibeyi (4)	Primé (15), Kobokobo (2), leungue (3), Boumé (41), Nioulé (2), Ndologa (2),	Alome (8), Kaki (16), Coucou / coucoudié (19), porélama (1), Nelbé (2),	-

					Nelmi (1)	
Wolof	Pomme cannel (26), corossol (7), Bétarape (1)	Khéwer (15)	Coco (10), Koni (58)	Primé (3), leungue (38), Nioulé (8), batanté (2)	Alome (60), Kaki (1)	-
Diola	Bouloloc (22)	Kaoul-baoul (22)	Sicompassé (23)	Primé (1), Koudjinké (22)	-	-
Serer	Pomme cannel (15), corossol (1)	Mima (1); Mbenthié (1); Khéwer (6)	Coco (6), Koni (19), Renne (1), Oule (1), ndof (1)	Leungue (18), Nène (2)	Nène / Anène (21), Alome (5), Ndof (1)	-
Mandinka	Corossol (1), Soukoug jambo (2)	Kouroudiendien (2)	Coco (1), Koni (3), Dialan (1), Sibo (2)	Primé (1), Koutouboul o (1)	Alome (2), Diambassab o (2)	-
Soninke	-	-	Coco (1), Koni (1)	-	Alome (1)	-
Narre	Pomme cannel (3)	Khéwer (1)	Koni (3)	leungue (2)	Alome (2)	-
Soussou	-	-	-	-	-	-

4. Discussion

The survey results highlight a notable variability in knowledge regarding edible wild species, as well as their dual use for dietary and therapeutic purposes. Some plants, such as *Borassus aethiopum* (89.1%) and *Vitex doniana* (72.2%), are widely recognized across the three study areas, reflecting both their availability and their importance in local usage. Other species, such as *Lepisanthes senegalensis* (27.4%) and particularly *Syncepalum dulcificum* (2.2%), are considerably less known, which may indicate ecological scarcity and a more marginal use. Comparisons between study areas reveal significant differences. The Ziguinchor region displayed a very high level of knowledge for almost all plants except *Diospyros mespiliformis*, likely due to greater accessibility to these species. Conversely, the Kaolack region exhibited the lowest levels of knowledge, particularly for *Annona senegalensis* and *Lepisanthes senegalensis*, suggesting lower presence of these species in the area or a marked disinterest possibly linked to socio-economic changes. Dakar showed intermediate knowledge levels for most plants, with relatively high recognition rates for *Borassus aethiopum* (89.9%), *Annona senegalensis* (75%), and *Vitex doniana* (73.6%), reflecting a certain valorization of these species in this urban area, likely facilitated by their commercialization. Age-class analysis revealed that respondents aged 25–34, 35–44, and 45–54 years exhibited higher knowledge levels. The observed result, particularly among the 25–34 age group, suggests relatively effective transmission of endogenous knowledge from older to younger generations. Regarding dietary use, a trend consistent with overall knowledge levels was observed. Plants such as *Borassus aethiopum* (87%), *Annona senegalensis* (66.1%), and *Vitex doniana* (72.2%) showed relatively high consumption rates. Indeed, knowledge of a plant within a community is a critical prerequisite for its actual use. Better mastery of associated knowledge tends to promote more frequent dietary use. Conversely, *Syncepalum dulcificum*, being almost unknown, was scarcely utilized (0.9%), reflecting its weak integration into traditional practices.

The results also highlighted a strong contrast in the plant parts consumed: fruits were predominantly used (52%), whereas leaves were almost never consumed (0.9%), and no use of seeds was reported. This imbalance underscores local dietary preferences and potential limitations related to preparation or acceptability of other plant parts. Furthermore, the survey revealed that these plants are traditionally employed in phytotherapy for various ailments. *Annona senegalensis* was the most used species (32.2%), with a wide range of therapeutic applications, including

treatment of vitamin deficiencies, fatigue, abdominal pain, bloating, and general digestive disorders. These findings confirm and extend observations in the literature (Elewa J. et al., 2025), which also report uses against hemorrhoids, malaria, fever, headaches, dental pain, cancer, and even snake bites, highlighting the diverse pharmacological potential of this species. *Borassus aethiopum* (21.3%) was primarily used to address sexual weakness and relieve digestive disorders, including abdominal pain, as noted by Ajavon (2019). *Vitex doniana* (18.7%) is locally recognized for specific properties in treating edema in pregnant women, as well as for blood-purifying and blood pressure-regulating effects. These uses complement previous scientific reports attributing therapeutic properties to this species against gastrointestinal disorders, respiratory conditions, diarrhea, malaria, ulcers, and reproductive and menstrual issues (Irampagarikiye R. et al., 2025). *Lepisanthes senegalensis* (13.9%) is traditionally recommended for its energizing properties, particularly in managing fatigue, as reported by Pépinière Sénégal (2025), suggesting a recognized tonic effect within local communities. Ethnobotanical surveys also attribute anticoagulant properties to this species, indicating its potential to modulate blood coagulation and prevent or treat thrombotic disorders. Although *Diospyros mespiliformis* is infrequently used for therapeutic purposes (2.6%), the literature describes a broad spectrum of ethnomedicinal applications, several of which have been scientifically validated. Traditionally, it is employed as an astringent, febrifuge, hemostatic, mild laxative, stimulant, vermifuge, and to facilitate childbirth (Ahmed et al., 2017). These diverse uses demonstrate its rich pharmacological potential and underscore its relevance for the development of new phytotherapeutic approaches, particularly in the study areas where its therapeutic applications remain insufficiently known and documented. By contrast, *Syncepalum dulcificum* had no reported therapeutic use. The low frequency of use may reflect a decline in ecological availability or an underexplored pharmacological potential.

5. Conclusion and Perspectives

The results highlight substantial variability in knowledge within the surveyed communities. Some species, such as *Borassus aethiopum*, enjoy broad recognition, whereas others, like *Diospyros mespiliformis*, are known at intermediate levels, and *Syncepalum dulcificum* remains largely unknown. This disparity is also reflected in dietary uses, with consumption levels corresponding to knowledge levels. Moreover, these plants are traditionally employed for therapeutic purposes to treat various ailments. These findings underscore the importance of continued efforts to preserve and promote this ethnobotanical heritage. Furthermore, they open avenues for additional research on processing, conservation, and industrial valorization, with the aim of supporting dietary diversification and nutritional resilience among local populations.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors of this article declare that there is no conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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