Scientific Research Publishing

Food and Nutrition Sciences, 2026, 17(3), 325-336
https://www.scirp.org/journal/fns
ISSN Online: 2157-9458
ISSN Print: 2157-944X

Ethnobotanical Survey of a Medicinal Plant *Balanites aegyptiaca* (L.) for Food and Therapy from Senegal

Mamoudou Diao[1], Edmond Antoine Badock[2], Abdoulaye Dramé[1*], Ibrahima Faye[1], Mada Faye[1], Mariame Sy[3], Doudou Diop[4]

[1]Faculty of Science and Technology, Chiekh Anta Diop University of Dakar, Dakar, Senegal
[2]Polytechnic Higher School, Cheikh Anta Diop University, Dakar, Senegal
[3]Research Training Unit, SATIC, Bambey, Senegal
[4]IFAN, Chiekh Anta Diop University of Dakar, Dakar, Senegal
Email: *abdoulay.drame@ucad.edu.sn

How to cite this paper: Diao, M., Badock, E.A., Dramé, A., Faye, I., Faye, M., Sy, M. and Diop, D. (2026) Ethnobotanical Survey of a Medicinal Plant *Balanites aegyptiaca* (L.) for Food and Therapy from Senegal. *Food and Nutrition Sciences*, **17**, 325-336.
https://doi.org/10.4236/fns.2026.173023

Received: January 27, 2026
Accepted: March 8, 2026
Published: March 11, 2026

Abstract

The need to validate the use of plants in food and traditional African medicine has prompted investigations into *Balanites aegyptiaca* (L.), about which knowledge is largely empirical. It is within this context that this work is situated, the objectives of which are to identify the therapeutic and nutritional properties of *Balanites aegyptiaca* (L.). Thus, an ethnobotanical study was conducted in the Linguère department (Dodji district) in Senegal during August 2025, with the aim of clarifying its various uses in food and even medicinal practices. This ethnobotanical study represents a fundamental tool for understanding and valuing traditional knowledge about *Balanites aegyptiaca*. It allows for the documentation of knowledge and practices related to the use of plants, while supporting their conservation and integration into sustainable development strategies. The results show that the fruit pulp and seed oil are the most commonly used parts in food, at 99% and 34% respectively. The pulp and peel are primarily used in therapy, at 72.27% and 32.67% respectively. A tiny proportion of 0.99% of those surveyed use a combination of several parts of the plant, including leaves, twigs, bark, roots and fruit, to compose multipurpose remedies often intended to treat chronic conditions or against supernatural beings. Several infections treated with *Balanites aegyptiaca* were identified during the investigation. These include high blood pressure (85%), the common cold (31%), malaria (9%), dental pain (7%), headaches (7%), sexually transmitted infections (STIs) (7%), and intestinal parasites (deworming effect) (12%). These results constitute a contribution to the establishment of an ethnobotanical data on *Balanites aegyptiaca* (L.).

Keywords

Balanites aegyptiaca, Linguère, Ethnobotanical Investigation, Food

1. Introduction

Since the dawn of humanity, humankind has maintained a close connection with its natural environment. This vital and dynamic relationship has constantly led humans to question nature in order to understand and secure the conditions for their own existence [1]. Today, this interaction takes on a crucial dimension in the face of global challenges related to food security. Indeed, despite the efforts undertaken, the achievement of Sustainable Development Goal 2 (SDG2) [2], which aims to eradicate hunger and ensure food and nutrition security by 2030, remains a major challenge for humanity.

In this context, wild edible plants and harvested local species play a crucial role. They contribute to strengthening the resilience of food systems and diversifying nutritional quality, while offering sustainable alternatives to conventional resources [3]. The exploitation of these traditional food sources, particularly through oils and other plant products, thus appears as a promising way to meet the nutritional and economic needs of rural populations. Among these resources, tropical agroforestry species (TAS) occupy a central place [4]. They support the livelihoods of approximately 80% of rural communities in sub-Saharan Africa, addressing their essential needs in food, health, and local economic development [5]. *Balanites aegyptiaca* (L.), commonly known as the desert date palm, is among these emblematic species [6]. Valued for the diversity of its uses: food, medicinal, cultural, economic, and even mystical [7], it constitutes a versatile resource of great importance to local population.

Ethnobotanical study represents a fundamental tool for understanding and valuing traditional knowledge. It allows for the documentation of knowledge and practices related to plant use, while supporting their conservation and integration into sustainable development strategies.

Thus, this research aims to evaluate the food, therapeutic, and cosmetic uses of *Balanites aegyptiaca* (L.) in this community, in order to provide quantitative and qualitative data likely to strengthen the sustainable use of this valuable resource.

2. Materials and Methods

2.1. Plant Material: *Balanites aegyptiaca*

Ethnobotanical investigations focused on *Balanites aegyptiaca*, or desert date palm, which is a tree of the Zygophyllaceae family [8] (**Figure 1**). It is often found on clay and sandy soils in arid and semi-arid areas of Africa, the Arabian Peninsula and South Asia [9]. Its global distribution is limited to the north by Jordan, to the south by Zimbabwe, and from east to west by Senegal and Somalia. Beyond the African continent, *B. aegyptiaca* is present in some Asian countries, notably

Iran, Palestine, Jordan, India, Oman, Saudi Arabia, Myanmar, and Yemen [10].

Balanites aegypytiaca is also called in some local languages [11]-[13].

Wolof: "Sump";

Sérére: "Model";

Bambara: "Ségéné";

Pulaar: "Golétéki";

Haussa: "Aduwa";

French: "Dattier du désert, Haguel balanites".

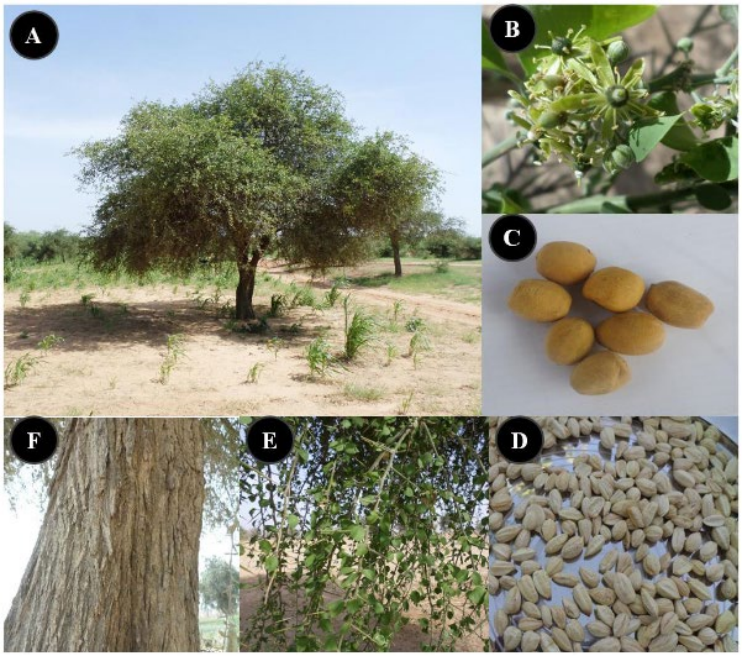

Figure 1. Representation of the different parts of *Balanites aegyptiaca* (A: Whole plant; B: Flower; C: Fruits; D: Seeds; E: Branches; F: Trunk).

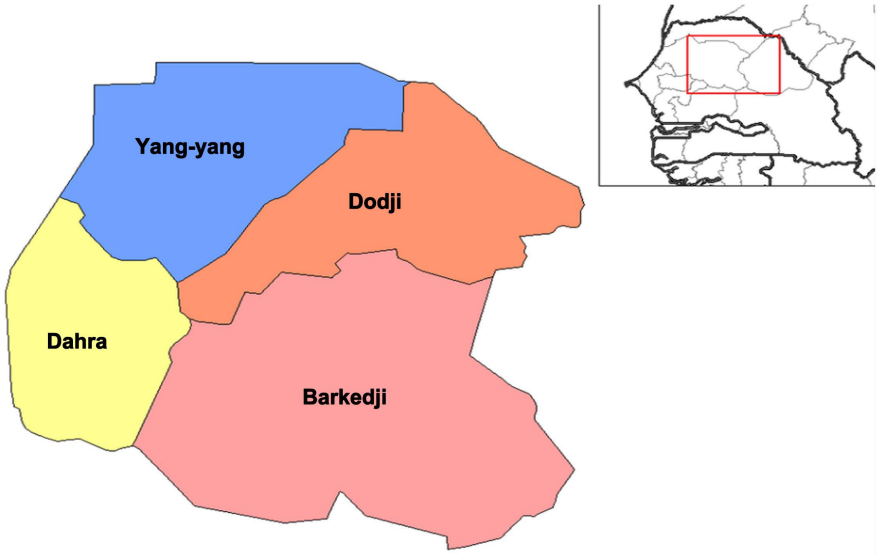

Figure 2. Geographical location of the survey area in Senegal.

Study Area

Senegal is located in the far west of Africa, between latitude 12˚8' and 16˚41' north and longitude 11˚21' and 17˚32' west. The fieldwork was conducted in August in the department of Linguère (Dodji district). The department of Linguère is located in northern Senegal, in the eastern part of the Louga administrative region, between latitude 15˚24' and 14˚00' north and longitude 15˚07' and 14˚04' west (**Figure 2**).

2.2. Investigation Method

A quantitative ethnobotanical study was conducted in the Dodji district. Data was collected from the local population using a questionnaire.

This questionnaire included the informant's profile (age, sex, ethnicity, education level, occupation, and marital status). The survey focused on the plant parts used, preparation methods, oil extraction techniques, and food, therapeutic, and cosmetic applications. In this quantitative ethnobotanical survey strategy, the target individuals were interviewed based on their knowledge of the plant, their availability, and their willingness to answer questions. The selection process was selective. The primary targets were arborists, individuals or groups who extract oil, and traditional healers residing in the localities at the time of the survey, and aged 19 years or older. These conditions constituted the selection criteria for the respondents.

3. Results

3.1. Data Analysis

A total of 101 people were interviewed, including 51 men and 50 women (50.5% male and 49.5% female), from two different ethnic groups (Fulani and Wolof). Individuals aged 20 - 40 years represented 42% of the sample, followed by those aged 40 - 60 years, who constituted 37% of the respondents. Individuals over 60 years of age and those aged 19 years constituted 20% and 1% of the respondents, respectively (**Figure 3**). Of those interviewed, 96 were married, representing 95% of the total number of people investigated. It should also be noted that 17 people (16.8%) extract the oil using traditional techniques (**Figure 4**).

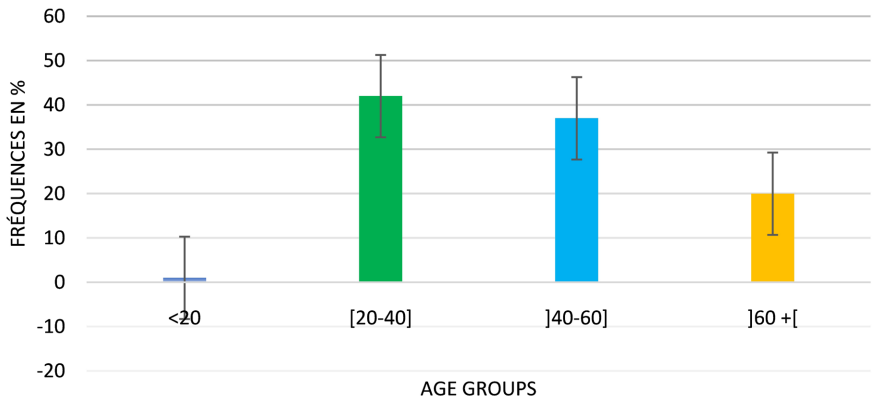

Figure 3. Representation of the age groups investigated.

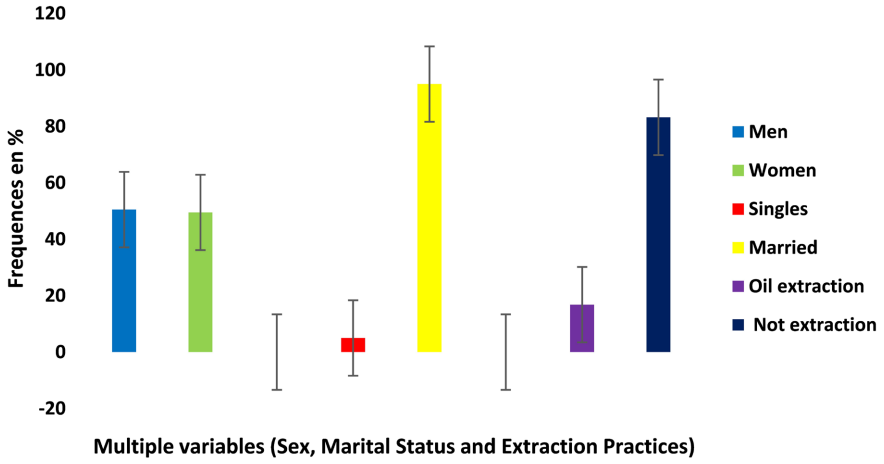

Figure 4. Data Illustration: Gender, marital status and extraction practices.

For each category of use and plant part used, the relative citation frequency (CRF) was calculated according to the formula:

$$\mathrm{CRF} = \frac{n}{N} * 100$$

with n = number of people who cited a use category, N = total number of respondents.

The use value was calculated to assess the ethnobotanical importance of *B. aegyptiaca* according to the formula.

$$\mathrm{UV} = \sum \frac{U_i}{N}$$

with U_i = Number of uses mentioned by respondent i for a given species, N = Total number of respondents. The results are summarized in the following Table 1.

Table 1. Average of use categories for different parts of *Balanites aegyptiaca*.

Uses parts	Human nutrition %	Food Animal %	Medicinal %	Cosmetic %
Leaves	22	98	13	00
Flowers	06	38	00	00
Whole Fruit	00	95	16	00
Bark	00	00	34	00
Twigs	00	01	04	04
Fruit pulp	99	00	82	00
Oil	34	00	03	06
Other	00	12	00	00
Moyenne	32.6	48.8	25.3	5

3.2. Knowledge of *Balanites aegyptiaca*

Balanites aegyptiaca is a family plant; the study reveals that all age groups of those

interviewed recognized the tree, representing a 100% recognition rate. They also highlighted its nutritional and medicinal benefits. Four percent of those interviewed learned about the plant through traditional healers. *Balanites aegyptiaca* has vernacular names derived from its uses, such as "Mourtoki" and "Mouthiéki", all of which refer to the act of sucking in Pulaar.

3.3. Food Uses of *Balanites aegyptiaca*

The data collected from the interviewees highlights the various ways in which this plant is incorporated into daily diets. The pulp of its fruit is particularly prized: 99% of respondents reported sucking it directly, demonstrating its popularity as a natural and readily available treat. The plant's leaves and flowers are also used in food, although less frequently. 22% of respondents use the leaves, and 6% the flowers, to prepare sauces. These parts are generally cooked with peanut paste and served with couscous in the evening, showing a well-established traditional culinary use. Finally, the oil extracted from the seeds of *Balanites aegyptiaca* is consumed directly; 34% of respondents reported using it by adding it to well-cooked rice, illustrating another way in which this plant is used in food (Figure 5).

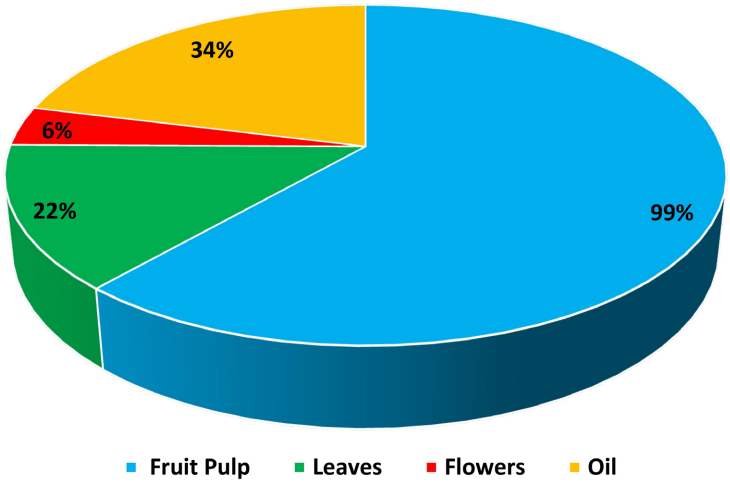

Figure 5. Representation of the different organs consumed.

3.4. Therapeutic Uses of *Balanites aegyptiaca*

According to the survey results, the pulp is the most commonly used part of the plant for medicinal purposes. In fact, 72.27% of respondents reported using the pulp for treatment, followed by the bark (32.67%), the whole fruit (19.80%), the leaves (5.94%), and finally the twigs (1.98%). A tiny proportion (0.99%) of respondents used a combination of several parts of the plant, including leaves, twigs, bark, roots, and fruit, to create multi-purpose remedies often intended to treat chronic ailments or ward off supernatural beings.

3.4.1. Fruit Pulp

Local medicinal practices regarding the pulp: 72.27% of respondents specifically

use the pulp of *Balanites aegyptiaca* for therapeutic purposes. This high proportion demonstrates the importance of this part of the fruit in traditional medicine.

Among these users, 59.40% consume the pulp without any prior preparation, often in its raw or dried form. It is used to treat various ailments such as stomach pain, high blood pressure, blood sugar levels, fever, constipation, parasite elimination, and digestive issues. *Balanites aegyptiaca* pulp helps soothe gastric disorders, regulates blood pressure, stabilizes blood sugar levels, acts as a fever reducer, facilitates intestinal transit with its fiber content, eliminates certain intestinal parasites, and improves digestion after heavy meals. Thus, *Balanites aegyptiaca* pulp occupies a central place in local traditional medicine. Its use without prior transformation demonstrates empirical knowledge passed down orally from generation to generation, based on the perceived effectiveness of its natural properties.

3.4.2. Stem Bark

The survey reveals that 33% of respondents use the stem bark of *Balanites aegyptiaca* to treat various ailments. At least ten diseases were identified as being treated with this part of the plant. These include headaches, sexually transmitted infections (STIs), high blood pressure, malaria, toothaches, colds, intestinal parasites (for its deworming effect), myopia, and general fatigue (Figure 6). Furthermore, the bark is used in spiritual practices for protection against evil spirits. The preparation methods mentioned are varied, with fumigation (78%) followed by maceration (12%).

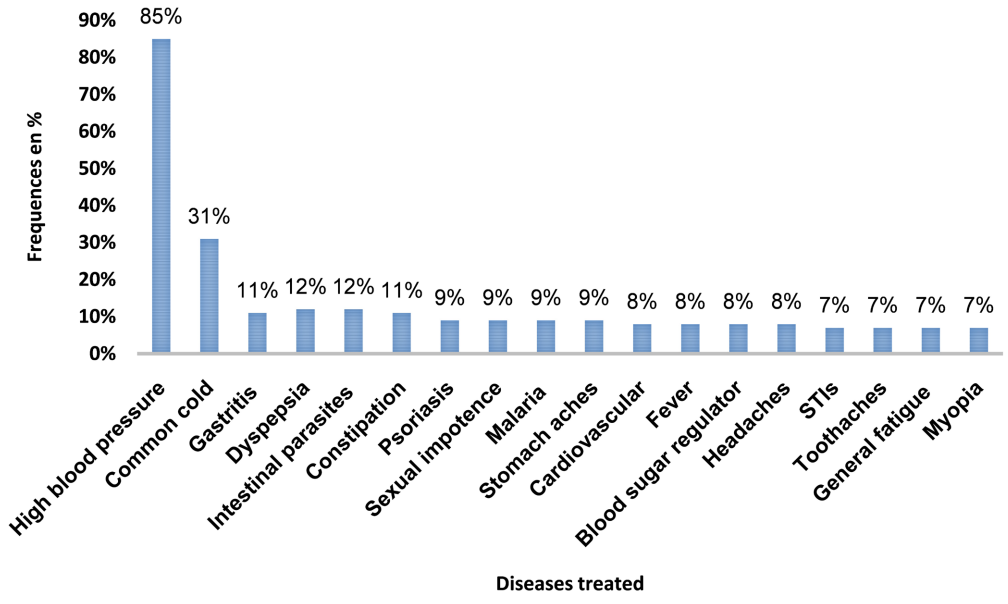

Figure 6. Representation of the diseases treated by the organs of *Balanites aegyptiaca.*

As part of the therapy, preparations are made to allow for effective administration during patient treatment. However, 60% of respondents prefer to use these organs without preparation, while 35% use maceration, 27% fumigation, 8% decoction, and finally, 5% infusion (Figure 7).

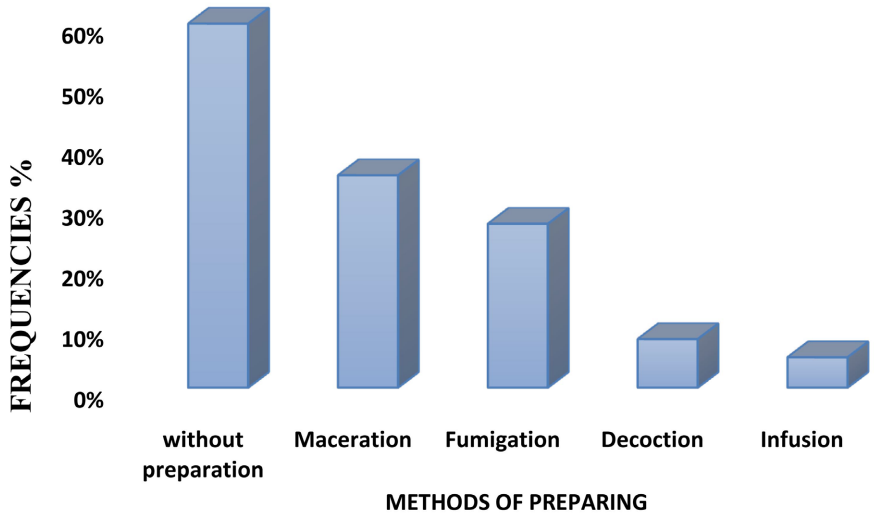

Figure 7. Methods of preparing the organs of *Balanites aegyptiaca* before administration.

3.5. Cosmetic Uses of the Oil and Branches of *Balanites aegyptiaca*

Beyond its medicinal properties, this plant is also of interest in the cosmetic field, particularly through the use of its seed oil and twigs. Survey results indicate that 5% of respondents use this oil as a skin-lightening cream, seeking a brighter and more even complexion. In addition to its lightening properties, the oil is also known for its ability to soften, nourish, and smooth the skin. Alongside topical use of the oil, the twigs of *Balanites aegyptiaca* are traditionally used as toothpicks or natural toothbrushes. Respondents report that regular use of these twigs helps whiten teeth and eliminate bad breath.

4. Discussion

The use and understanding of the plant do not vary depending on the group of individuals interviewed. Indeed, a 100% knowledge rate demonstrates a significant familiarity with the plant in this locality. This trend seems normal, given that it is domesticated; knowledge and applications of the plant are often acquired through extensive experience accumulated over generations and passed down from generation to generation [14] [15]. Furthermore, individuals under 20 years of age represented only 1%, while a large proportion of people aged [20 to 40] years was observed, which can be explained by the young nature of the population [16]. Furthermore, the experience and close connection with nature that older people enjoy play a vital role in their knowledge of the plant's uses [17]. These observations are consistent with the findings of Sandrine Gallois and co., concerning the transmission of empirical knowledge within a culture [18].

Regarding uses, the categories of applications for *B. aegyptiaca* include human food, medicinal plants, animal feed (fodder), timber and timber for construction and services, fuelwood (firewood and charcoal), as well as cosmetic and commercial uses. However, these results differ from those of Adamou [19] which did not mention its cosmetic use in Niger. However, the use of *B. aegyptiaca* in this area

remains the least familiar category for those interviewed in the study. On the other hand, the challenges associated with oil extraction and processing the press cake into soap limit this practice, despite its apparent expansion.

Consequently, these results highlight the strong pressure exerted by the population on the species, due to the unavailability of other plants capable of offering the same effects. Moreover, according to *Ayena and co*, *2046*, the greater the number of uses for a plant, the more the species is in demand and the more intense the pressure on it becomes [20]. *B. aegyptiaca* is involved in the treatment of eighteen (18) pathologies et symptoms, slightly more than the deseases treated mentioned by Maman Kamal in the Centre-East of Niger [15].

The pulp and oil are the main parts of the plant valued in both human food and traditional medicine, as confirmed by several studies [21] [22].

Thus, the high demand for the pulp is explained by its accessibility, but also by growing awareness of its nutritional and therapeutic value. As for the oil, its use is justified by its non-toxicity, confirmed by a study conducted in Nigeria [23], producing a high potential in vitamin [24], mineral salts [25], and in unsaturated fatty acids [21].

Overall, the plant is of remarkable interest in traditional medicine due to its numerous curative properties. According to the results, the organs of *B. aegyptiaca* are used in the treatment of cardiovascular diseases, infectious diseases, gastrointestinal disorders, dermatological conditions, neurological disorders, oral and dental problems, and sexual and reproductive health issues. Indeed, *B. aegyptiaca* is well integrated into the traditional medicine practiced in West Africa [26]. Many studies report various biological activities associated with the plant: extracts from the fruit pulp exhibit antioxidant activity [27]; the methanolic extract of the leaves exhibits anti-hepatitis activity [28]; the methanolic extract of the fruit exhibits antimicrobial activity [29]; the methanolic extract of these fruits exhibits antiparasitic activity [30]; and the antibacterial activity of the extract of the fruit of *B. aegyptiaca* has also been demonstrated [31] [32].

5. Conclusion

This study revealed the wide variety of uses for *Balanites aegyptiaca*, particularly in the food, therapeutic, and cosmetic fields. All vegetative parts of the plant were used, with the fruit pulp being the predominant product, sucked directly without preparation, while the seeds are used for oil extraction. Further studies on the *Balanites aegyptiaca* fruit, especially its oil, will be necessary in the future. Physicochemical, microbiological, and toxicological analyses will allow for a comparison of its nutritional properties with those edible oils such as peanut and sunflower oil.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Jean-Georges, C. (2016) Relations between Man and the Environment through the Analysis of the Symbolism of the Herbs and Trees in Caribbean Literature. *OALib*, **3**, 1-17. https://doi.org/10.4236/oalib.1102765

[2] Lartey, A. (2015) Èliminer la faim, assurer la sécurité alimentaire, améliorer la nutrition et promouvoir l'agriculture durable. *Chronique ONU*, **51**, 6-8. https://doi.org/10.18356/33bc5dea-fr

[3] Amadou, I., Ilagouma, A.T., Cheng, X. and Danjimma, M.Y. (2024) Less Privileged Edible Oil Source *Balanites aegyptiaca* (L) Del. Morphotypes and Physicochemical Properties. *Measurement*: *Food*, **14**, Article 100147. https://doi.org/10.1016/j.meafoo.2024.100147

[4] Admassu, M., Bekele, A. and Kim, J.C. (2013) Nutritional Composition of *Balanites aegyptiaca* (Desert Date) and *Hyphaene thebaica* (Doum Palm) Fruits Consumed by Hamadryas Baboons (*Papio Hamadryas Hamadryas*) in Awash National Park, Ethiopia. *Journal of Nutritional Ecology and Food Research*, **1**, 198-206. https://doi.org/10.1166/jnef.2013.1037

[5] Chérif, A.A., Houndonougbo, J.S.H., Idohou, R., Mensah, S., Azihou, A.F., Avocèvou-Ayisso, C., *et al.* (2023) Towards Sustainable Conservation and Domestication of *Balanites aegyptiaca* L. (Zygophyllaceae) in Africa: Progress and Challenges. *Journal of Arid Environments*, **218**, Article 105053. https://doi.org/10.1016/j.jaridenv.2023.105053

[6] Kolawole, M.A., Akakpo, A.D.M., Salako, K.V., Noulèkoun, F., Dimobe, K., Assogbadjo, A.E., *et al.* (2025) Provenance and Tree-to-Tree Differences in Germination Performance of *Balanites aegyptiaca* (L.) Delile: Insights for Domestication and Selection. *Heliyon*, **11**, e42279. https://doi.org/10.1016/j.heliyon.2025.e42279

[7] Habou, K.M.A., Abdou, L., Rabiou, H. and Mahamane, A. (2021) Impact des changements climatiques sur la dynamique de l'habitat potentiel de *Balanites aegyptiaca* (L.) Del. au Niger. *Revue Marocaine des Sciences Agronomiques et Vétérinaires*, **9**, 220-229.

[8] Salama, F., El-Tayeh, N.A., Zaher, A.M., El-Naggar, S. and Gaafar, A. (2023) Phytosociological Studies on the Associated Species of Balanites Aegyptiaca in the Eastern and Western Egyptian Deserts. *Egyptian Journal of Botany*, **63**, 1005-1029.

[9] Tsila, S.S. *et al.* (2025) Isolement, guidé par l'activité antiplasmodiale, de constituants de l'écorce de la tige de Balanites aegyptiaca. *Phytochemistry Letters*, **66**, 126-130.

[10] Thakkar, V., Dhakad, P.K., Mishra, R. and Gilhotra, R.M. (2025) Phytochemical and Pharmacological Profiling of Balanites Aegyptiaca Linn.: Exploring the Therapeutic Potential of a Traditional Medicinal Plant. *Phytomedicine Plus*, **5**, Article 100804. https://doi.org/10.1016/j.phyplu.2025.100804

[11] Chothani, D. and Vaghasiya, H. (2011) A Review on Balanites Aegyptiaca Del (Desert Date): Phytochemical Constituents, Traditional Uses, and Pharmacological Activity. *Pharmacognosy Reviews*, **5**, 55-62. https://doi.org/10.4103/0973-7847.79100

[12] Potel, A.M. (2002) Les plantes médicinales au Sénégal (Commune de Nguékokh, zone de la Petite Côte). *Extraits du rapport du stage (maîtrise de sciences naturelles) effectué à Nguekokh*, Sénégal, 2002.

[13] Hama, O., Ibrahim, D., Baragé, M., Alhou, B., Daniëls, P.P. and Infante, F. (2012) Utilisations de quelques espèces de Macromycètes dans la pharmacopée traditionnelle au Niger occidental (Afrique de l'Ouest). *Journal of Applied Biosciences*, **57**, 4159-4167.

[14] Abdoulaye, B., Béchir, A.B. and Mapongmetsem, P.M. (2017) Variabilité morphologique de *Balanites aegyptiaca* (L.) Del. dans la région du Ouaddaï au Tchad. *International Journal of Biological and Chemical Sciences*, **10**, Article 1733. https://doi.org/10.4314/ijbcs.v10i4.23

[15] Abdou, H.M.K., Rabiou, H., Abdou, L., Ibrahim, M.M. and Mahamane, A. (2020) Connaissances ethnobotaniques et importance socioculturelle de *Balanites aegyptiaca* (L.) Del. dans le Centre-Est du Niger. *Afrique Science*, **16**, 239-252.

[16] Agence Nationale de la Statistique et de la Démographie (ANSD) du Sénégal (2023) RGPH-5.

[17] Nolan, J.M. and Turner, N.J. (2011) Ethnobotany: The Study of People-Plant Relationships. In: Anderson, E.N., Pearsall, D., Hunn, E. and Turner, N., Eds., *Ethnobiology*, Wiley, 133-147.

[18] Google Scholar (2026) Social Networks and Knowledge Transmission Strategies....

[19] Adamou, S., Abdoul-Salam, A.I. and Aissetou, D.Y. (2020) Caractérisation de la population de *Balanites aegyptiaca* (L.) Del et la perception de son potentiel socio-oéconomique dans la partie Sud-Ouest du Niger. *International Journal of Biological and Chemical Sciences*, **14**, 1698-1715. https://doi.org/10.4314/ijbcs.v14i5.17

[20] Ayena, A.C., Agassounon Djikpo Tchibozo, M., Assogbadjo, A.E., Adoukonou-Sagbadja, H., Mensah, G.A., Agbangla, C., *et al.* (2016) Usages et vulnerabilite de pterocarpus santalinoides l'her. ex de (Papillionoidae), une plante utilisee dans le traitement des gastro-enterites dans le sud du benin. *European Scientific Journal, ESJ*, **12**, Article 218. https://doi.org/10.19044/esj.2016.v12n6p218

[21] Salam, S., Inoussa, C., Patrice, B., Firmin, S., Fréderic, B.S. and Mipro, H. (2025) Nutritional Value and Antinutritional Factors of *balanites Aegyptiaca* Seed Oils and Cakes for Animal Feed: A Review. *Food Science & Nutrition*, **13**, e70478. https://doi.org/10.1002/fsn3.70478

[22] Bessot, L. (2008) Etude des plantes médicinales utilisées dans le soin du paludisme au Burkina Faso. Thèse de Doctorat, Université Louis Pasteur-Strasbourg I UFR Sciences pharmaceutiques.

[23] Obidah, W., Nadro, M.S., Tiyafo, G.O. and Wurochekke, A.U. (2009) Toxicity of Crude *Balanites aegyptiaca* Seed Oil in Rats. *Journal of American Science*, **5**, 13-16.

[24] Elbadawi, S.M.A., Ahmad, E.E.M., Mariod, A.A. and Mathäus, B. (2017) Effects of Thermal Processing on Physicochemical Properties and Oxidative Stability of Balanities Aegyptiaca Kernels and Extracted Oil. *Grasas y Aceites*, **68**, e184. https://doi.org/10.3989/gya.1048162

[25] Yadav, G.G., Murthy, H.N. and Dewir, Y.H. (2022) Nutritional Composition and in Vitro Antioxidant Activities of Seed Kernel and Seed Oil of *Balanites roxburghii*: An Underutilized Species. *Horticulturae*, **8**, Article 798. https://doi.org/10.3390/horticulturae8090798

[26] Togola, I., Diallo, A., Tounkara, F. and Diarra, N. (2022) Entiel antioxydant in vitro de *Balanites aegyptiaca* (L.) Delile, une plante utilisée dans la prise en charge traditionnelle de l'hypertension au Mali. *MSAS*, Mali, 178.

[27] Abdelaziz, S.M., Lemine, F.M.M., Tfeil, H.O., Filali-Maltouf, A. and Boukhary, A.O.M.S. (2020) Phytochemicals, Antioxidant Activity and Ethnobotanical Uses of *Balanites aegyptiaca* (L.) Del. Fruits from the Arid Zone of Mauritania, Northwest Africa. *Plants*, **9**, Article 401. https://doi.org/10.3390/plants9030401

[28] Murthy, H.N., Yadav, G.G., Dewir, Y.H. and Ibrahim, A. (2020) Phytochemicals and Biological Activity of Desert Date (*Balanites aegyptiaca* (L.) Delile). *Plants*, **10**, Article

32. https://doi.org/10.3390/plants10010032

[29] Shinde, A.S., Ingole, V.V., Rasale, S.P. and Katade, S.R. (2025) *Balanites aegyptiaca* (L.) Delile: A Review of Its Traditional Uses, Phytochemistry and Biological Activities. *Phytomedicine Plus*, **5**, Article 100848. https://doi.org/10.1016/j.phyplu.2025.100848

[30] Shalaby, H., EL Namaky, A., Kandil, O. and Hassan, N. (2018) *In Vitro* Assessment of Balanites aegyptiaca Fruit Methanolic Extract on the Adult Toxocara Canis. *Iranian Journal of Parasitology*, **13**, 643-647.

[31] Ibrahim, O.H.M., Al-Qurashi, A.D., Asiry, K.A., Mousa, M.A.A., Alhakamy, N.A. and Abo-Elyousr, K.A.M. (2022) Investigation of Potential *in Vitro* Anticancer and Antimicrobial Activities of *Balanites aegyptiaca* (L.) Delile Fruit Extract and Its Phytochemical Components. *Plants*, **11**, Article 2621. https://doi.org/10.3390/plants11192621

[32] Ezemokwe, G.C., Aguiyi, J.C. and Chollom, F.P. (2020) The Antibacterial Activity of Aqueous and Ethanolic Leaf Extracts of *Balanites aegyptiaca* (l.) Del Plant on Some Selected Clinical Human Pathogens. *Journal of Advances in Microbiology*, **10**, 51-66. https://doi.org/10.9734/jamb/2020/v20i1030290