

Local perceptions and ethnobotanical study of galactogenic plants in the city of Abéché, Chad.

by Jana Publication & Research

Submission date: 09-Sep-2025 04:34PM (UTC+0700)

Submission ID: 2692515467

File name: IJAR-53730.docx (1.09M)

Word count: 3261

Character count: 19002

Local perceptions² and ethnobotanical study of galactogenic plants in the city of Abéché, Chad.

SUMMARY

Forest resources make a significant contribution to food security and public health in sub-Saharan Africa. Many studies have been conducted in this field, but very few have focused on the role of galactogenic plants in breastfeeding-related disorders.⁴ The study was conducted in the city of Abéché, capital of the Ouaddaï region, a hub in eastern Chad. Its objective was to contribute to the study of galactogenic plants in this city. To this end, an ethnobotanical survey was conducted among 54 people. It consisted of compiling endogenous knowledge on the various galactogenic plants and their uses. The results²¹ showed that the vast majority of respondents (84.9%) had information about galactogenic plants. The floristic inventory identified 35 species grouped into 23 families and 32 genera. The most important families represent 48.57%. These are the Poaceae family (20%), the Combretaceae (8.57%) and the Fabaceae (8.57%). Leaves are the most commonly used organs for preparing galactogenic recipes, accounting for 45.9%, followed by seeds (32.78%), bark (8.19%) and fruit (6.55%). The methods of preparation frequently used for making galactogenic recipes are decoction (75.4%), maceration (11.47%) and infusion (11.47%). The main route of administration for the recipes is oral. These results¹⁸ demonstrate the importance of plant resources for the health of this population. However, they raise the issue of plant species management and protection, as well as the need to take indigenous knowledge into account in public health policies in Chad. These plants are currently in high demand in rural areas, and in-depth studies on their chemical properties and uses should be carried out.

Keywords: Indigenous knowledge, galactogenic plants, breast milk, Abéché, Chad

I. INTRODUCTION

¹² Sub-Saharan Africa has the highest infant mortality rate in the world (UNIGME 2023). In the Sahel, and particularly in Chad, the high child mortality rate is partly caused by insufficient milk production in mothers (WHO, 2000). Solutions are always being considered to optimise milk production in breastfeeding mothers, but these remain costly and less accessible to poor households. Sufficient milk production in breastfeeding mothers would save more than 8 million babies aged 0 to 6 months worldwide and 11,500 aged 0 to 5 years in Chad

(UNICEF, 2018) . Early and exclusive breastfeeding is one of the essential interventions promoting neonatal survival (Gartner et al., 2005). Breastfeeding promotes the physical growth of the child, strengthens the mother-child bond, boosts the child's immunity and reduces the costs associated with purchasing formula milk and seeking medical care (Walters et al., 2017). However, the quality and quantity of breast milk are the result of many factors, primarily diet. Therefore, it is essential to find ways and means to boost breast milk production in nursing mothers. As a result, identifying woody plants and herbs that promote breast milk production is of paramount importance, particularly in developing countries where access to food supplements is limited. In Africa, people have always had a wealth of traditional knowledge thanks to the cultural and ecological diversity of the environment in which they live (Van Den Eyden et al., 1994). Faced with the real threats of anthropogenic pressure and climate change to the survival of plant resources, it is important to acquire as much information as possible about local galactogenic plant species. This would involve immersing oneself in traditional knowledge about galactogenic plants and the preparations that these populations use in order to offer inexpensive, sustainable and accessible solutions. The main objective of this study is to contribute to the study of galactogenic plants used in the city of Abéché.

13
II.

MATERIALS AND METHODS

II.1 MATERIALS

II.1.1 Overview of the study site

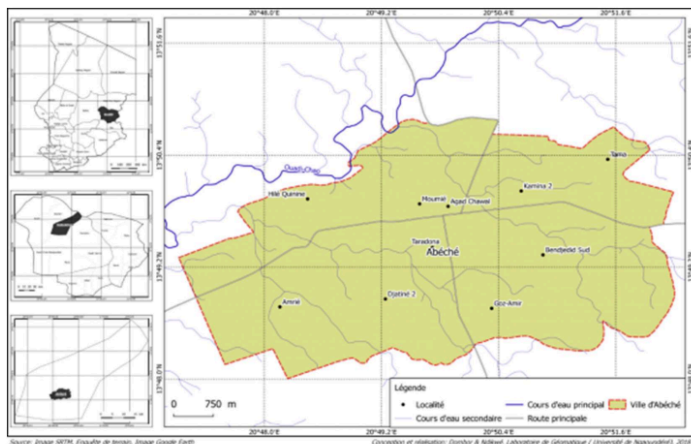


Figure 1: Map of the city of Abéché

The city of Abéché, capital of the province of Ouaddaï, is located in the Ouaddaï massif between 13°45'0" and 14°0'0" north latitude and between 20°40'0" and 21°0'0" east longitude (Figure 1). The city covers an area of 29,980 km² and has a population of approximately 200,000. Located in the centre of the Sahelian region, the province has a short rainy season (from July to September) and a long dry season, as well as relatively large temperature variations (Souleymane et al., 2017). Average annual rainfall is between 200 and 400 mm, with vegetation characterised by shrubby savannah and very open wooded steppe (Béchir & Kaboré-Zoungana, 2012). Water resources are mainly limited to temporary watercourses (ouadis) and alluvial aquifers. As in the rest of the country, agriculture employs more than 80% of the region's working population. Outside cultivated land, vegetation takes the form of savannah, ranging from grasslands with scattered trees in the north to woodlands in the south, with shrub and tree formations in between (Chahad et al., 2015). The most common woody species are *Acacia*: *Acacia tortillis*, *Acacia seyal*, *Acacia laeta*, *Acacia nilotica*, *Acacia senegal*, followed by *Balanites aegyptiaca*, *Ziziphus mauritiana*, *Boscia senegalensis*, *Bauhinia rufescens*, *Pilostigma toninguii*, *Sclerocarya birrea*, and *Guiera senegalensis*.

I.2 METHODOLOGY

II.2.1 Ethnobotanical survey

A socio-economic survey inspired by the method developed by Turfund et al. (2001) was conducted among men and women in the city of Abéché. Semi-structured interviews were conducted using a pre-designed questionnaire. The questionnaire was divided into three sections: socio-economic characteristics of the respondent, knowledge and social practices regarding breastfeeding, and local perceptions of galactogenic plants. It contained both closed and open-ended questions. The questions were asked in the local Arabic dialect. The respondents belonged to different ethnic groups. The individual interviews were supplemented by group interviews. The number of people per group varied between two and five.

II.2.2 Socio-demographic characteristics of respondents

The ethnobotanical survey on the traditional use of medicinal plants took place from 24 July to 27 August 2024. A total of 54 people were interviewed, including 23 men (42.59%) and 31 women (57.4%). The age of the interviewees ranged from 30 to 74 years, with an average age of 50. People over the age of 60 constituted the most represented age group, accounting for 37.03% (Figure 2). However, some very elderly people were avoided due to the risk of memory loss and unreliable responses. Young people (under 30 years of age) were not included in the study due to their inexperience. Regarding the educational level of the people interviewed, 52.83% were uneducated, the majority of whom were women. The people interviewed belonged to different social classes and had varied occupations (housewives, artisans, farmers, herders, civil servants, etc.).

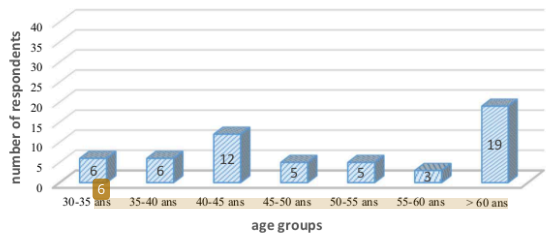


Figure 2: Distribution of respondents by age group

II.2.3 Study population

The survey involved people aged 30 and over. These included mothers, herbalists, artisans and other people interested in the study. Older people were more sought after because of their experience.

- **Inclusion criteria**

- Breastfeeding or non-breastfeeding mothers aged 30 years or older and residing in the city of Abéché;
- Herbalist or any other person (male) aged at least 30 years old and residing in the city of Abéché;

- **Exclusion criteria**

- Mother or other person not consenting to the study;
- Mother or other person not residing in the city of Abéché.

II.3 DATA ANALYSIS

The texts were entered using WORD 2016 software. The data collected was analysed using EXCEL 2016 software. The results were presented in tables and figures. This software was used to determine citation frequencies using the following formula: $FC = NC / NR \times 100$ (where: NC = Number of citations; NR = Total number of respondents).

III. RESULTS

III.1 Botanical inventory

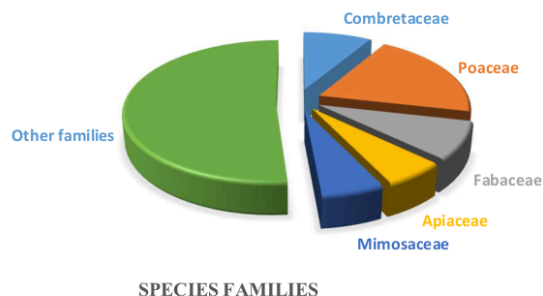


Figure 3: Frequency of galactogenic plant families

A total of 35 galactogenic species divided into 23 families and 32 genera were inventoried (Figure 07). The most important families represent (48.57%). These are: the Poaceae family with 7 species (20%), Combretaceae with 3 species (8.57%), Fabaceae with 3 species (8.57%) and finally Apiaceae and Mimosaceae with 2 species each. All other families are represented by a single species each (Table 3). These are Malvaceae, Bignoniaceae, Rubiaceae, Sapotaceae, Liliaceae, Apocynaceae, Pedaliaceae, Cesalpiniaceae, Zygophyllaceae, Bombacaceae, Moraceae, Moringaceae, Caricaceae, Lamiaceae, Euphorbiaceae, Arecaceae, Zingiberaceae and Cyperaceae. The most represented genera are Combretum, Cymbopogon and Acacia, with two species each.

Table 1: Distribution of species by family

Species	Local name	Family	FC	Part used
<i>Kigelia africana</i>	Machtour	Bignoniaceae	1,88	Fruit
<i>Cymbopogon citratus</i>	Citronnelle	Poaceae	1,88	Leaves
<i>Cinchona officinalis</i>	Quinin	Rubiaceae	1,88	Leaves
<i>Trigonella foenum-grecum</i>	Hilbé	Fabaceae	15,09	Seeds
<i>Vitellaria paradoxa</i>	Amkouroum	Sapotaceae	1,88	Fruit
<i>Allium sativum</i>	Toum	Liliaceae	3,77	Bulb
<i>Guiera senegalensis</i>	Khibbeche	Combretaceae	3,77	Leaves

<i>Sesamum indicum</i>	Simsim	Pedaliaceae	1,88	Seeds
<i>Tamarindus indica</i>	Ardeb	Cesalpiniaceae	1,88	Fruits
<i>Calotropis procera</i>	Ouchar	Apocynaceae	3,77	Leaves
<i>Foeniculum vulgare</i>	Chamar	Apiaceae	3,77	Leaves
<i>Balanites aegyptiaca</i>	Hadjilidj	Zygophyllaceae	1,88	Bark
<i>Sorghum bicolor</i>	Doura	Poaceae	1,88	Seeds
<i>Adansonia digitata</i>	Kalakouka	Bombacaceae	1,88	Leaves
<i>Arachis hypogea</i>	Foul	Fabaceae	3,77	Seeds
<i>Combretum glutinosum</i>	Habile	Combretaceae	1,88	Leaves
<i>Triticum sativum</i>	Guémé	Poaceae	1,88	Seeds
<i>Mentha spicata</i>	Nana	Lamiaceae	15,09	Leaves
<i>Zea mays</i>	Massar	Poaceae	3,77	Seeds
<i>Euphorbia hirta</i>	Amlibbéné	Euphorbiaceae	3,77	Leaves
<i>Acacia nilotica</i>	Garat	Mimosaceae	3,77	Leaves
<i>Daucus carota</i>	Carotte	Apiaceae	1,88	Leaves
<i>Ficus platiphylla</i>	Djimmez	Moraceae	1,88	Leaves
<i>Vigna unguiculata</i>	Loubia	Fabaceae	1,88	Seeds
<i>Cymbopogon schoenanthus</i>	Mahreb	Poaceae	1,88	Seeds
<i>Combretum micranthum</i>	Kinkliba	Combretaceae	1,88	Seeds
<i>Moringa oleifera</i>	Halloum	Moringaceae	1,88	Leaves
<i>Carica papaya</i>	pappa	Caricaceae	3,77	Leaves
<i>Hibiscus sabdariffa</i>	Karkagne	Malvaceae	3,77	Flowers
<i>Acacia senegal</i>	Kitir	Mimosaceae	1,88	Rubber
<i>Brachiaria riziensis</i>	Barsim	Poaceae	1,88	Seeds
<i>Pennisetum typhoides</i>	Doukhoun	Poaceae	1,88	Seeds
<i>Cyperus esculentus</i>	Sigguete	Cyperaceae	1,88	Rhizome
<i>Zingiber officinale</i>	Khouroundjal	Zingiberaceae	3,77	Rhizome
<i>Phoenix dactylifera</i>	Tamour	Arecaceae	1,88	Fruit

NC: number of citations; FC: frequency of citations

The plant species mentioned by respondents are woody and herbaceous plants. The most frequently mentioned plants are *Trigonella foenum-graecum* (fenugreek) and *Mentha spicata* (spearmint), each with 15.09% (Figure 4).



Euphorbia hirta L. (Source HSYZ)
Guiera senegalensis J.F.Gmel. (Source HSYZ)



Kigelia africana (Lam) Benth
Combretum glutinosum

Figure 4: Some local galactogenic species

III.2 Organs used

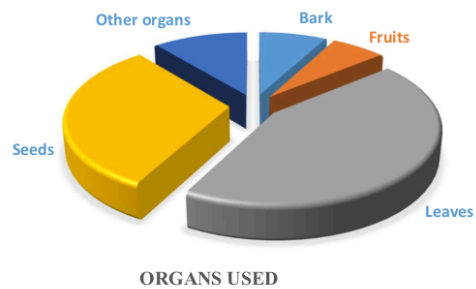


Figure 5: Frequency of use of organs

The whole plant or one of its parts are the different forms used in recipes. Figure 6 shows the frequency of use of plant parts. Analysis of this figure shows that leaves are the most commonly used part in the preparation of remedies, with a rate of 45.9%. Next come seeds (32.78%), fruits (6.55%), bark (8.19%) and finally rhizomes, bulbs, roots, gum and flowers, each with a rate of 1.63%.

II.3 Methods of preparation and administration of recipes

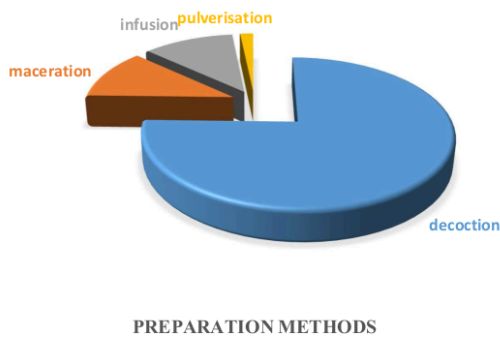


Figure 6: Frequency of different methods of preparing recipes

Figure 6 shows the different methods of preparing recipes and their frequency of use in milk production. The method most commonly used by the population of Abéché for plant-based recipes is decoction (75.4%), followed by maceration (11.47%) and infusion (11.47%). Oral administration is the only method used to administer remedies (100%) to increase milk production in breastfeeding women in this city.

Tablell: Distribution of species according to organs and preparation methods

Species	Families	Parts used	Preparation methods
<i>Kigelia africana</i>	Bignoniaceae	Fruit	Decoction
<i>Cymbopogon citratus</i>	Poaceae	Leaves	Decoction
<i>Cinchona officinalis</i>	Rubiaceae	Leaves	Decoction
<i>Trigonella foenum-grecum</i>	Fabaceae	Seeds	Decoction
<i>Vitellaria paradoxa</i>	Sapotaceae	Fruit	Maceration
<i>Allium sativum</i>	Liliaceae	Bulb	Maceration
<i>Guiera senegalensis</i>	Combretaceae	Leaves	Decoction
<i>Sesamum indicum</i>	Pedaliaceae	Seeds	Spraying + Infusion
<i>Tamarindus indica</i>	Cesalpiniaceae	Fruit	Infusion
<i>Calotropis procera</i>	Apocynaceae	Leaves	Decoction
<i>Foeniculum vulgare</i>	Apiaceae	Leaves	Macération
<i>Balanites aegyptiaca</i>	Zygophyllaceae	Bark	Decoction / Maceration
<i>Sorghum bicolor</i>	Poaceae	Seeds	Decoction
<i>Adansonia digitata</i>	Bombacaceae	Leaves	Decoction
<i>Arachis hypogea</i>	Fabaceae	Seeds	Decoction
<i>Combretum glutinosum</i>	Combretaceae	Leaves	Decoction
<i>Triticum sativum</i>	Poaceae	Seeds	Decoction
<i>Mentha spicata</i>	Lamiaceae	Leaves	Decoction
<i>Zea mays</i>	Poaceae	Seeds	Decoction
<i>Euphorbia hirta</i>	Euphorbiaceae	Leaves	Decoction / Infusion
<i>Acacia nilotica</i>	Mimosaceae	Leaves	Decoction
<i>Daucus carota</i>	Apiaceae	Leaves	Infusion
<i>Ficus platiphylla</i>	Moraceae	Leaves	Decoction
<i>Vigna unguiculata</i>	Fabaceae	Seeds	Decoction
<i>Cymbopogon schoenanthus</i>	Poaceae	Seeds	Decoction
<i>Combretum micranthum</i>	Combretaceae	Seeds	Decoction

<i>Moringa oleifera</i>	Moringaceae	²⁴ Leaves	Decoction / Infusion
<i>Carica papaya</i>	Caricaceae	Leaves	Decoction
<i>Hibiscus sabdariffa</i>	Malvaceae	Flowers	Decoction / Maceration
<i>Acacia senegal</i>	Mimosaceae	Eraser	Maceration
<i>Brachiaria riziensis</i>	Poaceae	Seeds	Decoction / Infusion
<i>Pennisetum typhoides</i>	Poaceae	Seeds	Decoction
<i>Cyperus esculentus</i>	Cyperaceae	Tuber	Infusion
<i>Zingiber officinale</i>	Zingiberaceae	rhizome	Decoction
<i>Phoenix dactylifera</i>	Arecaceae	Fruit	Maceration / Infusion

IV. DISCUSSION

Local perceptions of galactogenic plants²

The results of this study reveal that the majority (84.9%) of the population of the city of Abéché has very good knowledge of galactogenic plants. This population uses 35 plant species to boost milk production in nursing mothers. According to Mapongmetsem (2005), the large ⁷number of plants identified can be explained by the population's good knowledge of flora and the mixing of customs. The galactogenic properties of the species *Balanites aegyptiaca*, *Adansonia digitata* and *Guiera senegalensis* cited by these populations are also reported in the ethnobotanical surveys conducted by Wezel in 2002 in the Felingué department of Niger. Furthermore, the use of Poaceae such as *Sorghum bicolor*, *Zea mays* and *Pennisetum typhoïdesto* increase milk production in nursing mothers is consistent with the findings of authors such as KIE Deleke Koko et al. (2009).

Flora analysis

35 galactogenic species divided into 23 families and 32 genera are used by the population to increase milk production in breastfeeding women. Among the 23 families listed, Poaceae (20%), Combretaceae (8.57%) and Fabaceae (8.57%) are the most represented. The high proportion of Poaceae is explained by the greater species richness of this family in Chad (César and Châtelain, 2019). Periodically available ²⁰species are used in the preparation of galactogenic recipes according to preferences and knowledge of their virtues. *Trigonella foenum-grecum*, *Mentha spicata*, *Guiera senegalensis*, *Hibiscus sabdariffa*, *Foeniculum vulgare*, *Euphorbia hirta* and *Allium sativum* are, in order of importance, the most commonly used species in the various recipes.

Organs used

This study shows that leaves are the most commonly used organs. ³ The high frequency of use of this organ can be explained by its availability and ease of harvesting, but also scientifically by its photosynthetic activity. Indeed, leaves are the primary site of metabolite synthesis in plants. According to Dongock et al., 2017, leaves ¹⁷ are highly sought after by traditional healers because of their richness in active substances.

Galactogenic recipes

The majority of respondents are over 60 years old. The experience of these individuals could reflect the reliability of these recipes. Indeed, ⁵ knowledge of the uses of plants and their properties is generally acquired through long experience accumulated and passed down from generation to generation (Belamini et al., 2014). Some recipes include a single organ or a combination of organs such as leaves, seeds, bark, roots, etc. ² Decoction is the most commonly used method of preparation among this population. The importance of decoction shows that this population has a very good knowledge of this method of preparation and finds it suitable for extracting the active ingredients. ¹⁵ These results are similar to those obtained by Koulibaly et al. (2016), who showed that recipes vary from one species to another and are often administered in the form of a decoction. However, decoction can destroy certain active ingredients in the species used.

CONCLUSION

³ The ethnobotanical study of galactogenic plants in the city of Abéché identified 35 species divided into 23 families and 32 genera. These results demonstrated that there is a diversity of plant species that promote milk production in breastfeeding women in this city. This proves the importance of plant resources in the health of the Chadian population. Furthermore, they raise the issue of the management and protection of these resources and, at the same time, the need to take traditional knowledge into account in public health policies in Chad. Galactogenic plants are still in high demand in rural areas where breastfeeding is the only means of feeding infants. However, these plants are vulnerable, and in-depth studies on their chemical properties and uses should be carried out.

REFERENCES

- Baba Aissa F., 1999.** *Encyclopédie des plantes utiles. Flore d'Algérie et du Maghreb. Substances végétales d'Afrique, d'Orient et d'Occident.* Ed. Librairie Modeme Rouiba, EDAS, Alger, 368 p.
- Beloud A., 2001.** Medicinals plants in Algeria. University publications office, Algiers, ISBN; 9961. O. 0304, pp : 277.
- Béchir AB. & Kaboré-Zoungana C., 2012.** Fourragers ligneux des savanes du Tchad : structure démographique et exploitation pastorale. *Cameroon Journal Experimental Biol* 8 : 35-46.
- Chahad AM., Michalet S., Béchir AB., Abdelsalam T., Nkongmeneck BA., Dijoux Franca MG., 2015.** Medicinal plants from the Ouaddaï Province (Chad) : and ethnobotanical survey of plants used in traditional medicine. *The Journal of Alternative and Complementary Medicine*, 21 (9): 569-577.
- César J. et Châtelain C., 2019.** Flore illustrée du Tchad. 387 p.
- Chevallier., 2001.** Encyclopedie des plantes médicinales. Edit. Larousse, Paris, pp 16, 293-298.
- Dongock Ngemo D., Mapongmetsem PM., Abdoulaye M., Noiha Noumi V. 2017.** Ethnological studies of melliferous plants of the soudano-sahelian zone of Chad. *Journal of Medicinal Plant Studies*. 5(3) :193-198.
- Gartner LM., Morton J., Lawrence RA., Naylor AJ., O'Hare D., Shanler RJ., 2005.** Breastfeeding and the use of human milk. *American Academy of Pediatrics. Section on breastfeeding*. 115 (2) 496-506
- IKE Deleke Koko., Sylvie Hounzangbé-Adote MS. et sinsin B., 2009.** Etude des plantes galactogènes et emménagogues utilisées dans les terroirs riverains à la zone cynégétique de la Pendjari. *Int. J. Biol. Chim. Sci.* 3(6) :1226-1237.
- Khetoua M.L., 1987.** Comment se soigner par les plantes médicinales marocaines et internationales ? Tanger. p. 311.
- Koulibaly A., Monian M., Ackah J.A.A.B., Kone M.W. et Traoré K., 2016.** Etude ethnobotanique des plantes médicinales : cas des affections les plus fréquentes d'une région

agricole Daloa (Centre Ouest de la Côte d'Ivoire). Journal of animal & Plant Sciences. 31 (2) : 5021-5032.

Labbok M-H., 2001. Effect of the breastfeeding on the mother. *Pediatrics Clin North Am* ; 48 (1) : pp 143-58.

Ma B., Hieter P., et Boeke JD., 1997. Petits cadres de lecture ouverts de belles aiguilles dans la palette de foin. *Genome Res* 7(8) :71-768.

Mapongmetsem P.M., 2005. Représentation et gestion paysanne des jardins de case agroforestiers dans la zone périphérique de N'Gaoundéré (Adamaoua, Cameroun). *Cam. J. Ethnobotany* 1 (1) : 92-102.

Nathalie G., 2013. « Allaiter sur le web ». Entre biopouvoir et rituels numériques. *Les cahiers du numériques* ; 9(3) : 259-265.

OCHA, 2012. *Rapport sur la situation des réfugiés et des retournés tchadiens dans la région du Ouaddaï*. Office for the coordination of Humanitarian Affairs, Nations Unies, 10 p.

OMS, 2000. Collaborative study team on the breastfeeding on the prevention of infant mortality. Effect of breastfeeding on infant and child mortality due to infectious diseases in less developed countries: a pooled analysis. *Lancet* ; 335 : 451-5.

OMS, 2000. Recommandations de l'OMS en matière de l'alimentation du nourrisson, 01 mai 2001, <http://www.who.int>.

Salhi S., Fadli M., Zidane L., Douira A., 2010. Etude floristique et ethnobotanique des plantes médicinales de la ville de Kenitra. *Revue LAZA*. 31 (9). p 133.

Souleymane A.A., El Abdine A.Z., Ali M.M. et Nadjib G., 2017. Climatic trend in Sahel during 1950-2014: a case study of Ouaddaï region in Chad. *Mediterranean Journal of Biosciences*. Vol. 1, n°5. P.213-223.

Traoré M., Songho H., Diane MC., Faye A., Sidibé A., Koné K., 2014. « Facteurs associés à l'allaitement maternel exclusif chez les mères d'enfants à Bamako ». *Santé publique* ; 26(2) : 259-265.

UNIGME, 2023. United Nations Inter-agency Group for child Mortality Estimation. Level and Trend in child Mortality : report 2022. Estimates developed by the United Nations Inter-agency Group for child Mortality Estimation, United Nations Children's Fund, New-York.

Van Den Eyden V., Van Damme P. et De Wolf J., 1994. Inventaire et modelage de la gestion du couvert végétal pérenne dans une zone forestière du sud du Sénégal. Rapport Final. Partie C. Etude Ethnobotanique. Université de Gent, Belgique, 33-99.

Vandebroek I., Van Damme P., Van Puyvelde L., Arrizola S. et De Kimpe N., 2004. A comparison of traditional healers medicinal plant knowledge in the Bolivian and Amazon. *Social Science & Medicine*. 837-849.

Walters DS., Horton A.Y. Siregar M., Pitriyan P., Hajeerhoy N., Matisen R., Phan CJHP. 2017. "The of not breastfeeding in Southeast Asian, 31 (8):1107-116.

Wezel A., 2002. Plantes médicinales et leur utilisation traditionnelle chez les paysans au Niger. *Etudes Flor.Vég. Burkina Faso*, 6 : 9-18.

Local perceptions and ethnobotanical study of galactogenic plants in the city of Abéché, Chad.

ORIGINALITY REPORT

13%

SIMILARITY INDEX

9%

INTERNET SOURCES

9%

PUBLICATIONS

2%

STUDENT PAPERS

PRIMARY SOURCES

1	easpublisher.com Internet Source	1 %
2	assets.researchsquare.com Internet Source	1 %
3	www.scirp.org Internet Source	1 %
4	Bader Alhafi Alotaibi, Hazem S. Kassem, Abdullah AL-Zaidi, Mohamad A. Alyafsi. "Farmers' awareness of agri-environmental legislation in Saudi Arabia", Land Use Policy, 2020 Publication	1 %
5	Djibrine Adoum Oumar, Teissir Ibrahim Abakar, Hama Cissé, Salomon Madjitouloum Betouloum et al. "Ethnobotanical and Phytochemical Study of Medicinal Plants Sold in the Markets of the City of N'Djamena", Advances in Biological Chemistry, 2024 Publication	1 %
6	www.mloz.be Internet Source	1 %
7	Lucien Imorou, Euloge C. Togbé, Nicodeme V. Fassinou Hotegni, Daouda O. Bello et al. "Galactogenic plant diversity, phenology and local in situ conservation practices in agro-	1 %

ecological zones of Benin Republic", Genetic Resources and Crop Evolution, 2020

Publication

8	Submitted to Kaplan International Colleges Student Paper	1 %
9	Mariame Najem, Jamal Ibijbijen, Laila Nassiri. "Ethnobotanical treatment of respiratory diseases in the central Middle Atlas (Morocco): Qualitative and quantitative approach", European Journal of Integrative Medicine, 2021 Publication	1 %
10	"Handbook of dietary and nutritional aspects of human breast milk", Wageningen Academic Publishers, 2013 Publication	<1 %
11	Aicha Mouane, Alia Telli, Aicha Tedjani, Djouhain Achab et al. "Exploring Ethnobotanical Remedies: Medicinal Plants for Snakebite Envenoming Treatments in the Oued Righ Region (Northern Algerian Sahara)", Toxicon, 2025 Publication	<1 %
12	www.coursehero.com Internet Source	<1 %
13	journal.augc.asso.fr Internet Source	<1 %
14	Yves Djihounouck, Doudou Diop, Cesar Bassene, Seyni Sane, Kandioura Noba. "Ethnobotanical Uses of Non-cultivated Edible Fruit Species in the Department of Oussouye (South Senegal)", Journal of Food Research, 2021 Publication	<1 %

15	rosita.ro Internet Source	<1 %
16	anafe-africa.org Internet Source	<1 %
17	www.plantsjournal.com Internet Source	<1 %
18	Graciela da Silva Miguéis, Rosa Helena da Silva, Geraldo Alves Damasceno Júnior, Germano Guarim-Neto. "Plants used by the rural community of Bananal, Mato Grosso, Brazil: Aspects of popular knowledge", PLOS ONE, 2019 Publication	<1 %
19	Sanon, H.O.. "Edible biomass production from some important browse species in the Sahelian zone of West Africa", Journal of Arid Environments, 200712 Publication	<1 %
20	ethnobotanyjournal.org Internet Source	<1 %
21	innspub.net Internet Source	<1 %
22	techagro.org Internet Source	<1 %
23	www.researchgate.net Internet Source	<1 %
24	Mariam Oyedeji-Amusa, Nelson Cuboia, Kolawole Olofinisan. "Medicinal plants used in the treatment of Typhoid fever in Nigeria: A Systematic Review", Journal of Herbal Medicine, 2024 Publication	<1 %

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		