

(RESEARCH ARTICLE)



## Ethno botanical study of some rare medicinal species in Tunisia: Case of *Laurus nobilis* L

Nouri Jdaidi \* Houcine Selmi, Foued Aloui and Abes Chaabane

University of Jendouba, Sylvo-Pastoral Institute of Tabarka, 8110, Tabarka, Tunisia.

Comprehensive Research and Reviews in Science and Technology, 2022, 01(01), 030–036

Publication history: Received on 28 July 2022; revised on 05 September 2022; accepted on 08 September 2022

Article DOI: <https://doi.org/10.57219/crst.2022.1.1.0024>

### Abstract

This work is focused on the ethnobotanical study of a species known for its medicinal, ecological, economic and ornamental importance in Tunisia. The methodology consisted in carrying out a direct questionnaire on 300 people located in Tabarka and Ain Draham, which made it possible to collect a valuable amount of information concerning the use of *Laurus nobilis* L. The results of this study showed that the leaves are the most used organ (71%) and most remedies are prepared as a decoction (58%). The use of laurel sauce in the therapeutic field promotes digestion and treats various diseases such as urinary and dental infections, bronchitis and rheumatism. It appears that more than 68% of users have shown the effectiveness of this species.

The present study constitutes a database for further research in the pharmaco-biological and phytochemical fields in Tunisia.

**Keywords:** *Laurus nobilis* L.; Ethnobotanical study; Medicinal plants; Tunisia

### 1 Introduction

Plant extracts have been used in medicine for centuries. Today, while certain plant extracts benefit from both preclinical and clinical evidence, many health professionals and patients remain critical of the effectiveness of phytotherapy for many reasons. Firstly, it is the presence of plant extracts with variable quality on the market, without standardization and poorly characterized. Secondly, it is the lack of reliable data on their benefits and their tolerance, key elements in an evidence based medicine approach. Nevertheless, the interest in medicinal plants has been considerably renewed in recent years due particularly to a growing mistrust of drugs and the enthusiasm for natural health solutions [1].

Bay leaf sauce (*Laurus nobilis* L.) is a plant with medicinal and aromatic importance, which belongs to the Lauraceae family, an important often aromatic botanical family; its species can be recognized by their aromatic smell. These include 32 genera and around 2000 to 2500 species, some of which produce popular essential oils, such as cinnamon, sassafras, camphor, bay leaf.

The Lauraceae are one of the most important tropical ligneous families [2]. Laurel grows in damp and shady places, but also in gardens, where it is grown as a condiment. It is native to the Mediterranean basin [3]. This family is poorly represented in Africa but very common on the American or Asian continent, in Australia and Madagascar [4]. In Tunisia, this species increases in subhumid bioclimates mainly. It is poorly represented in the northwest of the national territory and more particularly in Kroumirie. Currently, it is widely cultivated as an ornamental plant, an important remedy in traditional medicine and for commercial production in the food industry. Several authors, such as Fiorini et al., Kivçuk and Mert. [5,6] have shown that the leaves of *Laurus nobilis* L. also contain polar flavonoids (glycolysis derivatives of

\* Corresponding author: Nouri Jdaidi

University of Jendouba, Sylvo-Pastoral institute of Tabarka, 8110 Tabarka, Tunisia.

quexetinekaempferol and catechin) and apolar (four acyl derivatives of k ampferia); sesquiterpenes lactone; isoquinoline alkaloids and rich in vitamin E.

This species is mainly used, orally, in the symptomatic treatment of disorders of the upper digestive tract such as epigastric bloating, slow digestion, belching and flatulence [3].

In Tunisia, laurel sauce is widely used by infusion to treat abdominal cramps and as a flavoring in cooking. It is frequently used as an ornament in private and public gardens. Fresh bay leaves are used by local people to repel flies.

In the northwest of Tunisia, this species of great agro-ecological and economic interest is often overexploited by the local population, which has a negative impact on its subsequent development as well as on the ecological distribution and the quality of their products.

Given this context, the main objective of this work is to carry out an ethnobotanical study on this species near the local population to collect all the information on the therapeutic and traditional local applications.

---

## 2 Material and methods

### 2.1 Study area

The study was carried out in two regions in Tabarka (N36°52'10" E008°46'33") and Ain Draham (N36°46'13" E008°46'36") in the northwest of Tunisia. These two forests have a moderately rugged terrain. The altitude varies from 0 meters in Tabarka (sea side) to 1100 meters in Ain Draham (Djebel El Bir).

The climate, belonging to the humid Mediterranean floor, ranges from the warm winter variant (lower underfloor) in the Tabarka region to the temperate winter variant (upper underfloor) in the Ain Draham region. According to data from the two meteorological stations of Tabarka and Ain Draham, the average annual rainfall varies from 980 to 1512 mm, respectively. The average annual temperature varies little between the two sites (11 to 13  C).

The forest domain covers more than 75% of the total area of the selected stations. The vegetation cover is dominated by the strong presence of cork oak, zen oak and by a very dense shrub layer composed of a few *Laurus nobilis* L. plants (Fig.1).



**Figure 1** different organ of *Laurus nobilis* L. (Photo, N, Jdaidi, 2017)

### 2.2 Methods

#### 2.2.1 Sampling

According to the random sampling mode, we divided our study area into stations, so we have 6 large stations, 2 of which correspond to the numbers of the Tabarka station. By proceeding with proportional stratified random sampling (Table 1), samples of 50 people per station, in total, we have 300 people surveyed.

**Table 1** Breakdown of surveys by station

Station	Number of surveys
Station 1	50
Station 2	50
Station 3	50
Station 4	50
Station 5	50
Station 6	50
Sample	300

### 2.2.2 Ethnobotanical surveys

During the second phase, we based on the same ethnobotanical survey sheet that was carried out by Jdaidi et al., Bouzid. [7,8]. This work lasted more than 4 months during which we interviewed 300 people aged from 20 to over 60, divided into 75% women against 25% men and at different academic levels. The profile of each survey includes its age, its sex, and its academic level, use of the plant, instructions for use and the parts used.

The selection of study areas is justified by the following parameters:

- The ecological habitat of this species;
- The availability of data on the environment.

The data from the survey sheets were transferred to a database and processed by the statistical analysis software XLSTAT2020.

## 3 Results and discussion

### 3.1 Distribution of the profile of the people surveyed according to sex, age group and school level

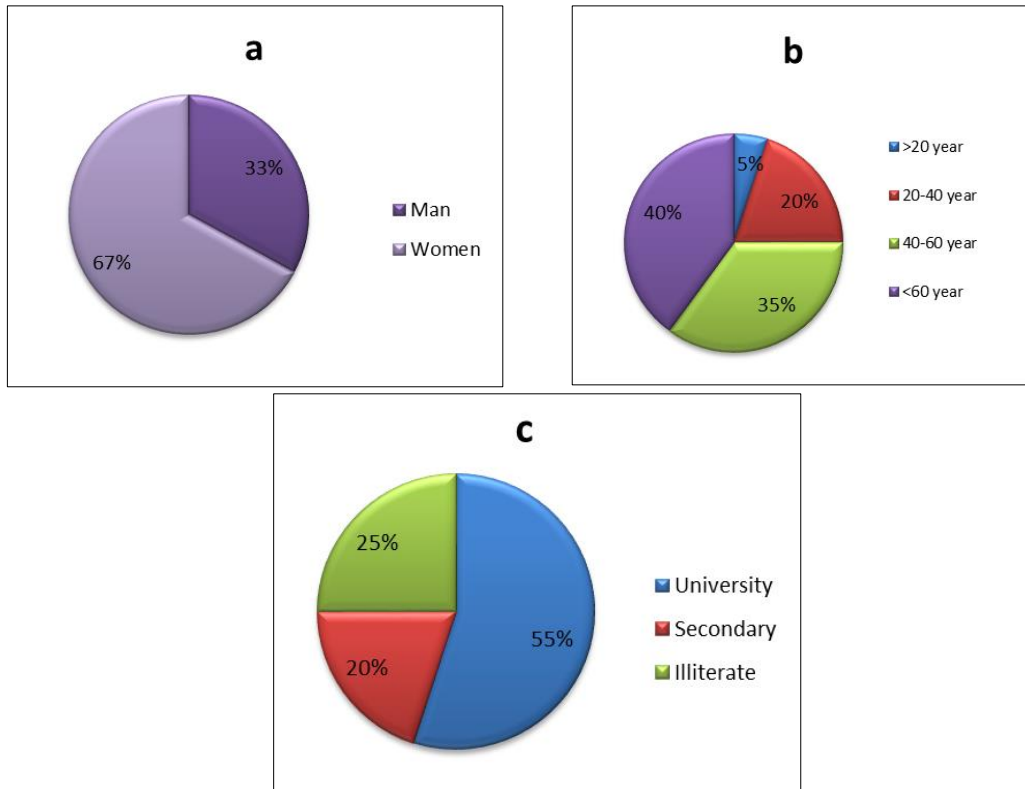
Figure 2a shows that women (67%) have more information on medicinal plants and on the use of *Lauris nobilis* L. than men (33%).

Our results confirm with the results of other ethnobotanical study Jdaidi et al., Bouzid., Mehdioui and Kahouadji. [7, 8, 9] and show that men collect medicinal plants only. While, the care of family members is done generally by women.

Figure 2b shows that the use of this medicinal species is a common practice in the age groups ranging from 20 to over 60 years old with a predominance in people over 60 years old (30%) followed respectively by people aged from 40 -60 years (45%), 20-40 years (20%) and > 20 years (5%). The results obtained illustrate that the elderly have more knowledge in medicinal plants compared to young people. Jdaidi et al. [7] showed that 82% of the oldest people (> 40 years old) surveyed have more knowledge of medicinal plants compared to other age groups. This percentage is a good illustration of the local medicinal knowledge mastered by this category of the population. Bouzid [8] has demonstrated that the experience accumulated with age is the main source of information at the local level about the use of plants in traditional medicine.

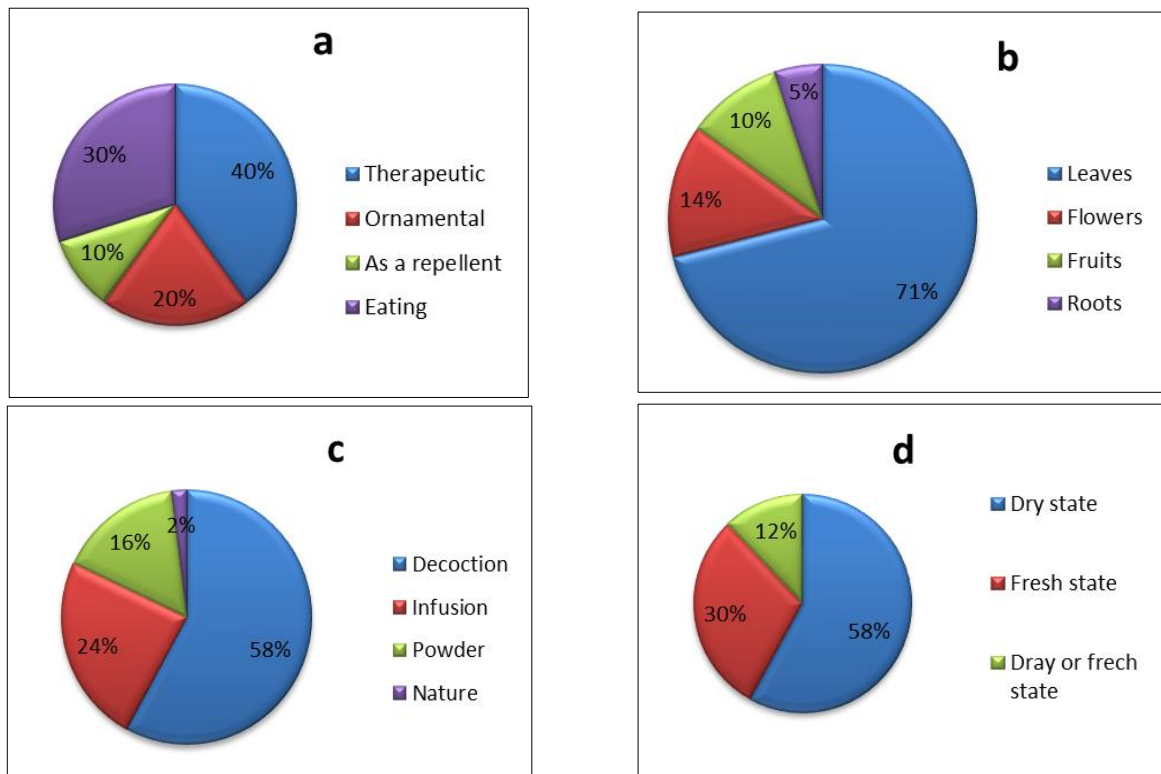
The Knowledge of the uses of medicinal plants and their properties is generally acquired through long experience accumulated and transmitted from one generation to another. The transmission of this knowledge is currently in danger because it is not always guaranteed [10].

As elucidated in figure 2c, all the (55%) of laurel users have a higher education level, 25% of people have a secondary academic level while 20% are illiterate. The vast majority of users of *Lauris nobilis* L. in Tunisia are people with a university education. This is explained by the interest shown by this category in medicinal plants in recent years.



**Figure 2** Distribution of the profile of the people surveyed according to gender (a), age groups (b) and academic level (c)

### 3.2 Use of the plant, part used, method of preparation and condition of the plant



**Figure 3** Distribution of methods of preparation of *Lauris nobilis* L. by the people surveyed according to the use of the plant (a), part used (b), method of preparation (c) and state of the plant (d)

In Tunisia, it appears that 40% of respondents use this species in herbal medicine to treat themselves while 30% of people use it as a flavoring in cooking. However, 20% of people cultivate this species for ornamentation in private and public gardens and 10% of respondents use the leaves of *Laurus nobilis* L. as a repellent to ward off flies (Fig. 3a).

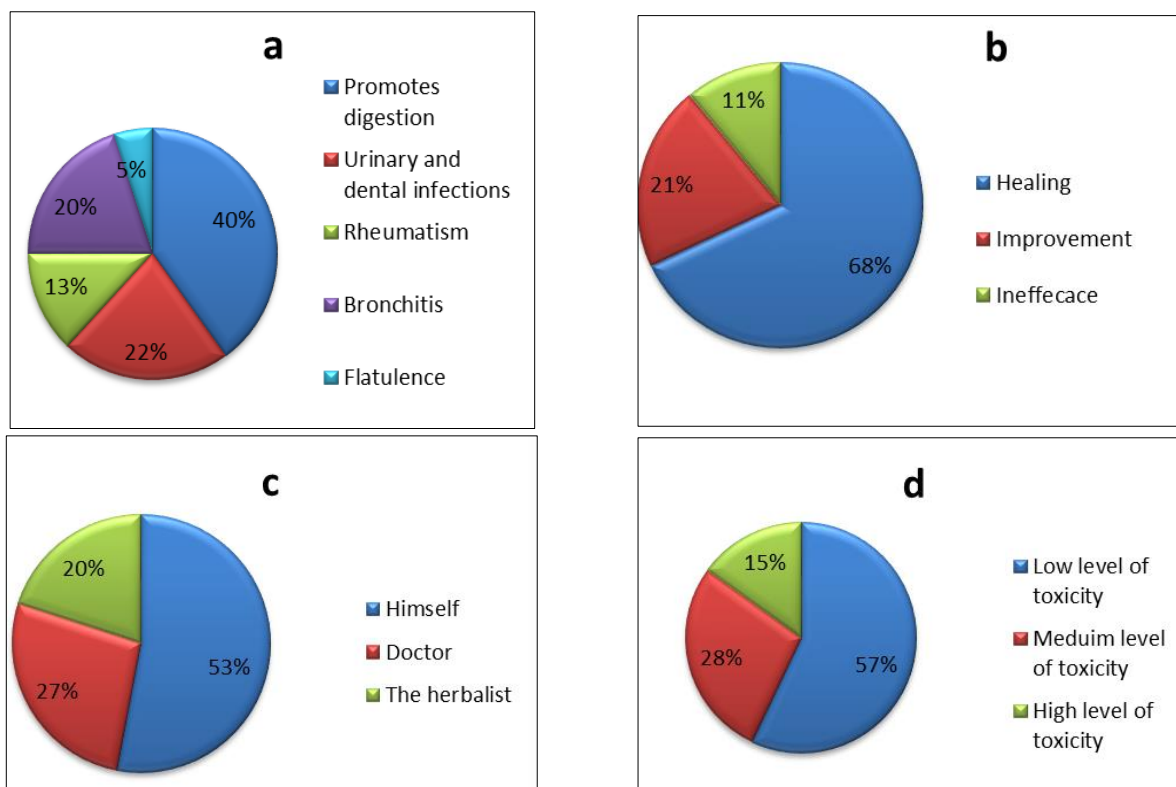
According to people surveyed, the plant parts used ranked in decreasing order of importance are: the leaves (71%), the flowers (14%), the fruit (10%) and the roots (5%) (Fig. 3b). All of the people surveyed frequently use bay leaves in sauce in the kitchen as a flavoring. They are usually dried. The dried flowers are used in infusion. Our results are consistent with other studies (Jdaidi et al., Bouzid., Ngbolua et al. [7,8,11]).

The high frequency of use of leaves can be explained by the ease and speed of harvesting [12] but also by the fact that they are the site of photosynthesis and sometimes the storage of secondary metabolites responsible for the biological properties of the plant [13].

The results obtained show that the decoction is the mode of treatment most used for this species (58%), followed by the infusion (24%) and powder (16%). The natural instructions for use represent only (2%) (Fig. 3c). This mode of preparation would make it possible to collect the most active ingredients and would attenuate or cancel the toxicity of certain recipes [14]. Several studies have shown that users are always looking for the simplest method to prepare phytomedicines (Jdaidi et al., Dougnon et al., Salhi et al. [7, 15, 14]. Figure 4d provides information on the state of use of *Laurus nobilis* L. in Tunisia. 58% of people prepare medicinal recipes in a dry state, while only 30% of respondents use the plant in a fresh state. However, 12% of people surveyed prepare their medicinal recipes in a dry or fresh state.

### 3.3 Therapeutic induction, results of use, therapeutic choice and level of toxicity

This study consisted in identifying and collecting information on the main diseases treated by this species in Tunisia. The results show that laurel sauce is involved in the treatment of several illnesses such as, bronchitis (20%), promotes digestion (40%), urinary and dental infections (22%), rheumatism (13%) and flatulence (5%) (Fig. 4a). In This study showed that *Laurus nobilis* L. is traditionally used to treat stomach ache.



**Figure 4** Breakdown of treatment methods for *Lauris nobilis* L. by the people surveyed according to therapeutic induction (a), results of use (b), therapeutic choice (c) and level of toxicity (d)

Users of this species estimate the cure rate for certain illnesses is about 68%, on the other hand 21% of those surveyed believe that laurel sauce improves their state of health. However, 11% of them believe that this species is ineffective (Fig. 4b). Figure 4c illustrate information on the therapeutic choice. The results obtained show that 20% of those

surveyed go exclusively to the herbalist for treatment compared to 27% of people who go to the doctor to use this species. Additionally, 53% of people use it to treat themselves without any consultation. In general, the misuse of *Laurus nobilis* L. to treat certain diseases or as a flavoring in Tunisian cuisine can cause certain levels of toxicity. From the investigation in this study, it appears that 15% of those interviewed show that the abusive use of this species causes a high level of toxicity, while 28% indicate that the toxicity is average. However, 57% of respondents show that the level of toxicity is low following the excessive use of bay leaf sauce (Fig. 4d).

---

## 4 Conclusion

This study is part of the investigation of rare medicinal species in the northwest of Tunisia. This work shows that women have an important medicinal knowledge in comparison to men. The use of *Laurus nobilis* L. is a common practice by the local population with a predominance among people aged 40-60 years, with a predominance for the university level and that the foliage constitutes the most used part in the dry state. The decoction is the most used mode of preparation while laurel sauce is widely used in the therapeutic and food field with a low level of toxicity. The use of this species can promote digestion and treat urinary and dental infections. The results of this ethnobotanical study showed that *Laurus nobilis* L. is widely used in Tunisia in the food, medicinal and ornamental fields.

Most importantly, we provide in this work sufficient information for a better plan of conservation and valorization of this rare medicinal species, thus, to carry out in-depth studies in future pharmaco-biological and photochemical studies to better understand the mechanism of action of natural compounds of laurel sauce in Tunisia.

---

## Compliance with ethical standards

### *Acknowledgments*

We would first like to thank the people surveyed from the two sites of Tabarka and Ain Draham whom we met. Their intelligence to share their knowledge of this species and traditional knowledge to many contributes to the smooth running of this work.

### *Disclosure of conflict of interest*

The authors, Jdaidi N., Selmi H., Aloui F. and Chaabane A. declare that no conflict of interest exists with them in whatsoever.

---

## References

- [1] Guinobert I, Bardot V, Dubourdeaux M. From the plant to the biological effects of the extract: when a scientific approach sheds light on uses. *Phytotherapy*. 2019; 17: 149-155. DOI 10.3166/phyto-2019-0132
- [2] Marongiu B, Marzouki H, Medini H. Essential oil and antibacterial activity of berries of *Laurus nobilis* L. *Jeobp*. 2009; 12 (4): 422-434.  
<https://doi.org/10.1080/0972060X.2009.10643740>
- [3] Iserin P (2001) *Encyclopedia of medicinal plants*, Volume 2. Ed. Larousse. London. 143: 225-226.
- [4] Yakhlef G) Study of the biological activity of the leaf extracts of *Thymus vulgaris* L. and *Laurus nobilis* L. Thesis Magister. EL hadj lakhdar University, Batna. 2010: 55-78.
- [5] Fiorini C, David B, Fouraste I. Acylated kaempferol glycosides from *Laurus nobilis* L. leaves. *Phytochemistry*. 1998; 47: 821–824.  
[https://doi.org/10.1016/S0031-9422\(97\)00563-3](https://doi.org/10.1016/S0031-9422(97)00563-3)
- [6] Kivçak B, Mert, T. Quantitative determination of  $\alpha$ -tocopherol in *Arbutus unedo* L. by TLC-densitometry and colorimetry. *Fitoterapia*. 2001; 72: 656-661.  
[https://doi.org/10.1016/S0367-326X\(01\)00305-7](https://doi.org/10.1016/S0367-326X(01)00305-7)
- [7] Jdaidi N, Hasnaoui B. Floristic and ethnobotanical study of medicinal plants in northwestern Tunisia: Case of the community of Ouled Sedra. *Journal of Advanced Research in Science and Technology*. 2016; 3(1): 281-291.

- [8] Bouzid K. Contribution to the study of development options for the *Arbutus unedo* L. species in western Algeria, 3rd cycle doctoral thesis, Djillali Liabés University of Sidi Bel-Abbés. 2015: 122-176.
- [9] Mehdioui R, Kahouadji A. Ethnobotanical study among the local population of the Amisttène forest: case of the commune of IminTlit (Province of Essaouiria). Bulletin of the Scientific Institute, Rabat, life sciences section. 2007; (29): 11-20.
- [10] Anyinam C. Ecology and ethnomedicine. Exploring links between current environmental crisis and indigenous medical practices. *Social Science and Medicine*. 1995; (4): 321-329.  
[https://doi.org/10.1016/0277-9536\(94\)E0098-D](https://doi.org/10.1016/0277-9536(94)E0098-D)
- [11] Ngbolua KN, Inkoto CL, Mongo NL. Ethnobotanical and floristic study of some medicinal plants marketed in Kinshasa, Democratic Republic of Congo. *Rev. Mar. Sci. Agron. Vet.* 2019; 7 (1): 118-128.
- [12] Bitsindou M. Survey on traditional herbal medicine in Kindamba and Odzala (Congo) and analysis of the convergence of the use of medicinal plants in Central Africa". *Memory. Doc (ined.)*. Univ. Free of Brussels: 1986. 336-482.
- [13] Bigendako-Polygenis MJ, Lejoly J. The traditional pharmacopoeia in Burundi. *Pesticides and drugs in animal health*. Close. Univ. Namur. 1990: 425-442.
- [14] Salhi S, Fadli M, Zidane L. Floristic and ethnobotanical studies of medicinal plants in the city of Kenitra (Morocco). *Lazaroa*. 2010; 31: 133-146.
- [15] Dougnon TV, Attakpa E, Bankolé H. Ethnobotanical study of medicinal plants used against a contagious skin disease: Human scabies in southern Benin, *CAMES Review – Pharm Series. Med. Transl. Afr.* 2016; 18(1): 16-22.