Traditional knowledge on the plant ingredients of an indigenous herbal dish from Beni Haoua region, northern Algeria

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Research

Abstract

Background: The coastal Mediterranean region of Beni Haoua, located in Chlef province, north Algeria, is recognized with rich culinary heritage exploring wild and cultivated plant resources, but not sufficiently documented. This research is undertaken to inventory and document the indigenous knowledge of a unique local herbal dish from the region named **Khobbiz/Lahchich**.

Methods: Ethnoculinary data were collected through survey with 52 autochthonous women from the region of Beni Haoua. Relative frequency of citation (RFC), growth habits, growth status, plant parts used, and preparation method were documented, alongside cultural practices related to the traditional dish.

Results: The indigenous herbal dish is prepared from 14 edible plant species, predominantly wild taxa (64.3%), while cultivated herbs account for 35.7%. These species belong to nine botanical families, with *Asteraceae* being the most represented (28.57%), followed by *Apiaceae* and *Amaryllidaceae* (14.28% each). Most edible plants exhibit a herbaceous growth habit (92.9%), whereas trees represent only 7.1%. Leaves constitute the principal plant part used (68.8%), granting the characteristic green color to the dish. They are followed by bulbs (12.5%), oil, fruits, and seeds (6.2% each). Traditional knowledge also highlights a specific method for preparing olive oil and barley-derived products incorporated into the **Khobbiz/Lahchich** dish.

Conclusions: This study revealed a specific traditional dish made totally from vegetarian ingredients in Beni Haoua region. This dish merits valorization by phytochemical and nutritional investigations to unravel their characteristics and therapeutic properties.

Keywords: Wild edible plants; Culinary tradition; Mediterranean diet; Beni Haoua; Chlef province.

Background

The Mediterranean communities are characterized by a diverse herbal culinary heritage that reflects the region's rich biodiversity and contributes to the uniqueness of the Mediterranean diet, which is widely recognized for its beneficial effects on human health. Indigenous herbal foods prepared partly or entirely from edible plants are considered important sources of macro- and micronutrients, as well as bioactive constituents such as phenolic compounds, which exert protective effects against a wide range of ailments associated with modern lifestyles and dietary habits (Farràs *et al.* 2021; Baydoun *et al.* 2023; Gori *et al.* 2025). Documenting these traditional preparations is therefore highly recommended in order to valorize and preserve gastronomic heritage.

Despite the wide documentation of Mediterranean herbal traditions in several countries (Tardío *et al.* 2005; Blanco-Salas *et al.* 2019; Baydoun *et al.* 2023; Merouane *et al.* 2025; Patti *et al.* 2025), local traditions in certain regions remain understudied due to the lack of scientific data and limited involvement of local authorities and associations. One such region is the Berber district of Beni Haoua, located in Chlef Province in northern Algeria. The local community maintains is strongly related to its cultural and culinary heritage, incorporating both wild and cultivated edible plants into traditional food preparation (Merouane *et al.* 2022; Merouane *et al.* 2025).

The traditional herbal dish commonly known as **Khobbiz** is widespread in northern Algeria; however, its preparation mode and plant ingredients vary by region. In many areas, the dish is prepared solely from the wild edible plant Malva sylvestris L., which gives the dish its name in Arabic (**Khobbiz**) and in Berber languages (Medjir). In Beni Haoua region, the dish is called Lahchich, meaning "herbs," and is distinguished by a specific preparation method that incorporates numerous cultivated and wild edible plants. These wild ingredients are regarded as natural nutraceutical foods and are generally harvested by women from fields during late autumn, winter, and early spring following rainfall and the emergence of green herbaceous growth. Herb gathering is also a cultural learning practice in which children accompany women to acquire traditional plant knowledge through observation and participation. Cultivated components used in the dish are similarly prepared using specific local techniques practiced by women, including olive oil and a barley-based product locally known as **Iwzan-n-Zambou**.

Although the Beni Haoua region possesses rich and unique indigenous knowledge related to the preparation and ingredients of this herbal dish, no ethnoculinary study has yet documented this heritage. Therefore, the aim of the present research is to inventory the plant constituents and describe the preparation method of the **Lahchich** dish through an ethnobotanical survey conducted with autochthonous women living in the region.

Materials and Methods

Study area

Bengkulu The study area corresponds to the Beni Haoua coastal district, situated in the extreme northeastern part of Chlef Province. It is located approximately 160 km west of the capital Algiers and about 95 km northeast of Chlef, the provincial capital. Geographically, it extends between 36°19'35" and 36°33'16" N latitude and 1°22'50" and 1°41'59" E longitude (Fig. 1) (GeoNames 2026), covering approximately 110.39 km². According to the 2004 census, the district had a population of 20,289 inhabitants (Cheliff.org 2026), predominantly of Berber origin, mainly descending from the Ath-Haoua and Ath-Hidja tribes. The local population is largely engaged in agricultural activities, and the area is characterized by well-preserved traditional practices and a distinct cultural heritage.

Beni Haoua district is predominantly mountainous and bordered to the north by the Mediterranean Sea, to the east by Damous District (Tipaza Province), to the west by the Oued Goussine district, and to the south by the Breira and Zebboudja regions. The climate of the region is typically Mediterranean (Köppen-Geiger classification: Csa), characterized by hot, dry summers and relatively rainy winters, with an annual rainfall of 527 mm and an annual mean temperature of 17.6 °C. The average winter temperature is about 10.6 °C (January), while the average summer temperature reaches approximately 26.0 °C (August) (Climate-Data.org 2026).

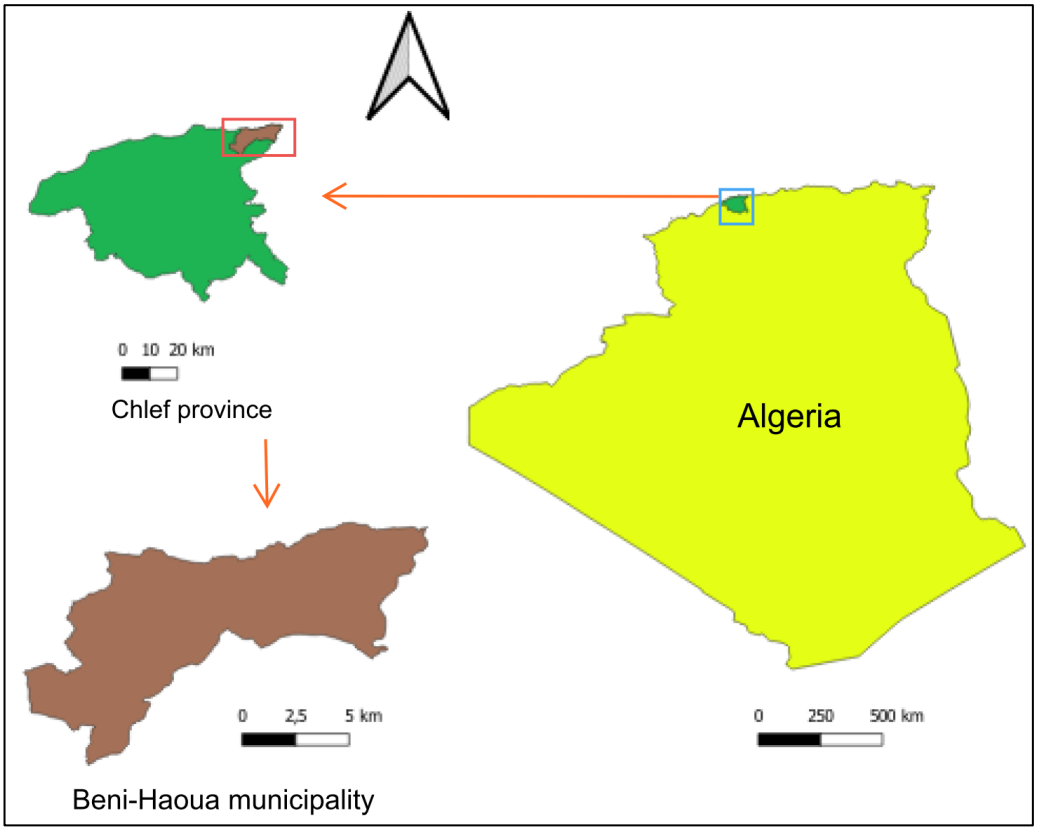

Figure 1. Maps showing the location of Beni Haoua area

Data Collection

The To obtain a comprehensive overview of traditional knowledge, data on the preparation of the local herbal dish known as "**Lahchich**", also referred to as "**Khobbiz**" in Arabic, were collected through semi-structured surveys conducted with 52 elderly indigenous women residing in the Beni Haoua region, aged between 57 and 86 years, all of whom were illiterate.

The recorded information on the plant species used in this traditional dish included the scientific (binomial) name, botanical family, local name (Berber and/or Arabic), plant part used, growth habit, and status (wild or cultivated), preparation mode. Plant species were identified by Dr. Abdelaziz Merouane, and the scientific names were verified using The Plant List database (http://www.theplantlist.org).

Frequency of citation (RFC)

The values of this index range from 0 to 1, reflecting the relative importance of each species in the preparation of the traditional herbal dish. A high value indicates that the species is essential or obligatory, whereas a low value suggests that the species is optional in the preparation if it is not found in the field.

The RFC is calculated as the ratio between the number of informants who reported the use of a given species (n) and the total number of informants involved in the survey (N), as follow (Tardío *et al.* 2008):

$$RFC = n / N$$

Data Analysis of the diversity

The diversity of plant families and plant parts used was assessed using the Shannon-Wiener diversity index (H') and Pielou's evenness index (J'). These indices were calculated based on the frequency of citation of each family. Graphical representations and statistical analyses were performed using R software (version 4.2.3; R Foundation for Statistical Computing).

Shannon-Wiener diversity index (H')

To assess the diversity of plant species in terms of their families used in the traditional herbal dish, the Shannon-Wiener diversity index (H') was calculated using the formula (Agize *et al.* 2025):

$$H' = -\sum P_i \ln P_i$$

Where, pi is the proportion of informants citing the i species relative to the total number of informants; H' is the Shannon diversity index, and ln is the natural logarithm.

Pielou's evenness index (J')

To complement the Shannon-Wiener diversity index, Pielou's evenness index (J') was calculated to determine whether species are evenly distributed (homogeneity) among families. It is calculated as follow (Dutta *et al.* 2025):

$$J' = \frac{H'}{\ln S}$$

Where, H' is the Shannon diversity index and S is the total number of families. Values of J' range from 0 to 1, with values closer to 1 indicating a more uniform distribution of species among families, and values near 0 indicating that species are concentrated in a few families.

Results and Discussion

Preparation method of the dish

After harvesting of all necessary plants, the leaves were thoroughly rinsed with water to remove adhering soil particles and non-edible parts (roots, basal portions, and senescent leaves, prickles and thorns). The remaining edible young leaves, together with fresh garlic and onion, were chopped and homogenized (Fig. 2). The chili pepper was added optionally according to preference for pungency; when a spicy flavor was desired, small pieces of chili pepper were chopped and incorporated with the plant mixture at the beginning of cooking. For consumers who preferred a non-spicy preparation, particularly children, chili pepper was either avoided or added whole during cooking to limit the release of pungent compounds. The herbal mixture was then transferred to a vessel containing boiling water and cooked for 15-20 min under moderate heating with occasional stirring. During cooking, olive oil and salt were added. Subsequently, barley **Tchicha** locally know **Iwzan-n-Zambou** (coarsely crushed barley grain) was incorporated, and cooking was continued until a semi-solid consistency was achieved. The dish was served with olive oil and a whole chili pepper.

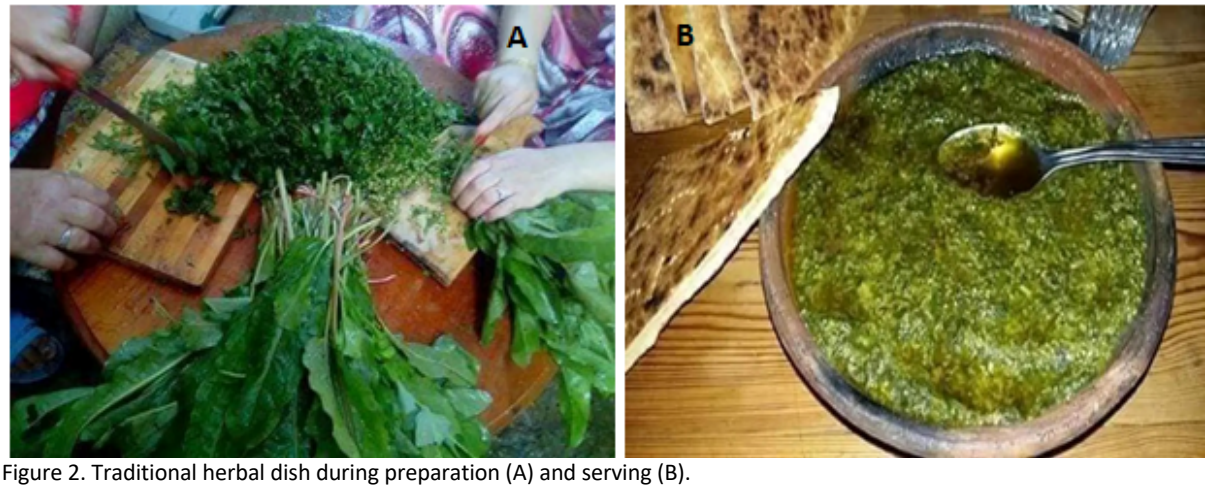

Figure 2. Traditional herbal dish during preparation (A) and serving (B).

Taxonomic diversity of plants

The preparation of the local traditional herbal dish **Khobbiz/Lahchich** in Beni Haoua region involves fourteen plants (Table 1). These species are distributed in nine botanical families dominated by *Asteraceae* (28.57%), followed by *Apiaceae* and *Amaryllidaceae* (14.28% each), and other families were represented by 7.14% (Fig. 3).

Previous ethnobotanical surveys in Chlef Province, to which the Beni Haoua district administratively belongs, reported the culinary importance of members of the *Asteraceae* family for food preparation during the holy month of Ramadan (Merouane *et al.* 2022), as well as their use as wild plants in diverse culinary uses among rural communities (Merouane *et al.* 2025).

Members of the *Asteraceae* family are widely consumed by Mediterranean communities. In Spain, the culinary tradition reports more than 65 species used as wild vegetables (Tardío, 2010). In Italy (Calabria region), the *Asteraceae* family was identified as the most important herbal group across different ethnobotanical uses (Patti *et al.* 2025). This importance is mainly attributed to their sensory (Guil-Guerrero *et al.* 1998), nutritional (García-Herrera *et al.* 2014), and medicinal

properties (Rolnik & Olas, 2021), as well as their adaptability to different habitats and environmental conditions (Garcia-Oliveira *et al.* 2021). These potentialities have led to the cultivation of several *Asteraceae* species for human consumption (Guil-Guerrero *et al.* 1998).

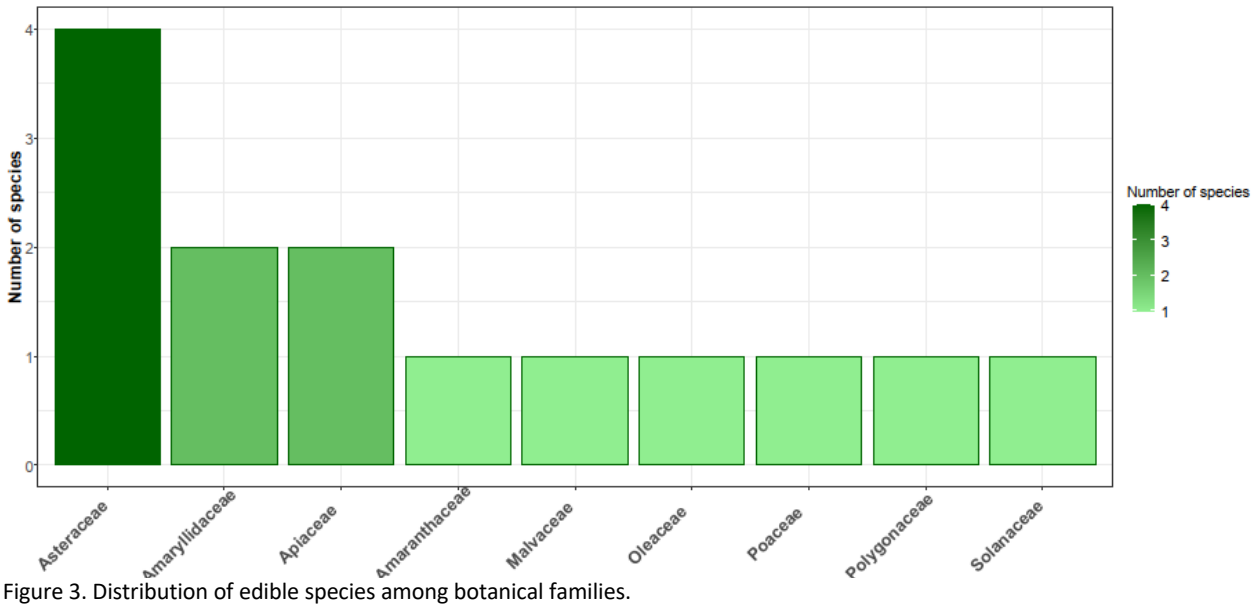

Figure 3. Distribution of edible species among botanical families.

The diversity of plant families was evaluated using the Shannon diversity index (H'= 2.04), which measures how many families are represented and how they are distributed, and Pielou's evenness index (J'= 0.93), which indicates how evenly species are shared among families. The high Shannon index value reflects substantial diversity among the recorded botanical families. However, the relatively low evenness index indicates an unequal distribution, with certain families being more dominant than others. *Asteraceae* was the most dominant family, while most other families were represented by only one or two species.

Traditional knowledge and relative citation frequency

In Beni Haoua region, the preparation of the herbal traditional dish **Khobbiz/Lahchich** is traditionally a female responsibility, including plant harvesting, selection, processing, and cooking. Women therefore play a central role in the preservation and transmission of traditional gastronomic heritage, which is primarily transmitted through intergenerational learning within households. As pillar custodians of culinary practices, they ensure the continuity of plant-use traditions and local culinary heritage. For this reason, only women were included in the present survey, as they are the main holders and transmitters of the knowledge associated with the preparation of the **Khobbiz/Lahchich** dish. This observation aligns with previous studies emphasizing the essential role of women in maintaining and consolidating gastronomy and gastronomic heritage, particularly in sustaining cultural gastronomy across generations (García-Henche et al., 2024).

Seven plants, including *Hordeum vulgare* L., *Rumex pulcher* L., *Olea europaea* L., *Malva sylvestris* L., *Scolymus hispanicus* L., *Allium cepa* L., and *Allium sativum* L., representing 50% of the ingredients, were reported by all informants, showing an RFC = 1. This value indicates that these herbs are pillar constituents of the **Khobbiz/Lahchich** dish. Other species ranged from RFC = 0.34 (*Cynara cardunculus* L.) to RFC = 0.94 (*Sonchus oleraceus* L.), indicating variable preferences for the use of these herbs among the local informants (Table 1).

Hordeum vulgare L. is a necessary ingredient of the herbal dish; however, the derived product added is a specific locally prepared form, known as **Tchicha** in Arabic or **Iwzan-n-Zambou** in Berber. This preparation consisted of to harvest the barley spikes while still green-yellow, before full maturity. The spikes are then dried, the grains separated, roasted, hulled, and finally crushed manually using a traditional stone mill to obtain a coarse flour, which serves as the final product, after elimination of bran, for use in diverse recipes.

Historically, barley is one of the earliest domesticated cereals for human consumption in many civilizations especially in Asia and North Africa (Lukinac and Jukic, 2022). The food uses of barley is related to its richness in starch (≈60%), sugars and carbohydrate fibers, amino acids, fatty acids, and other microelements including minerals, vitamins and bioactive compounds (Ullrich, 2011). **Iwzan-n-Zambou** or **Tchicha** (barley product) is widely used in Beni Haoua region and other region in Algeria for the preparation of known **Harira** soup especially during holy month of Ramadan and social events (Merouane *et al.* 2022). The use of barley adds a nutritional and healthy value to the traditional **Khobbiz/Lahchich** green dish.

Table 1. List of plants used in the preparation of the herbal **Khobbiz/Lahchich** dish from Beni Haoua region, northern Algeria.

Family	Plant species	Local name	Part used	Species status	Growth Habit	RCF
Amaranthaceae	*Beta vulgaris L.*	Essalk	Leaves	W	Herb	0.87
Amaryllidaceae	*Allium sativum* L.	Thoum/ Icherth	Bulb, Leaves	C	Herb	1
Amaryllidaceae	*Allium cepa L*.	Bassal	Bulb, Leaves	C	Herb	1
Apiaceae	*Daucus carota* subsp. *carota*	Jazar barri	Leaves	W	Herb	0.88
Apiaceae	*Anisosciadium lanatum* Boiss.	Besbas barri / bsibsa	Leaves	W	Herb	0.35
Asteraceae	*Scolymus hispanicus* L.	Guernina/Agheddou	Leaves (Central nerve)	W	Herb	1
Asteraceae	*Cynara cardunculus L.*	Khorchef barri/Khorchef aberhouch	Leaves (Central nerve)	W	Herb	0.34
Asteraceae	*Taraxacum erythrospermum* Andrz. ex Besser	Dars el-aajouz	Leaves	W	Herb	0.53
Asteraceae	*Sonchus oleraceus* L.	Tilfaf, Loubina	Leaves	W	Herb	0.94
Malvaceae	*Malva sylvestris* L.	Khobbiz/Medjir	Leaves	W	Herb	1
Oleaceae	*Olea europea* L.	Zaytoune/Azemmour	Oil	C	Tree	1
Poaceae	*Hordeum vulgare* L.	Cha'ir/Imzin	Seeds	C	Herb	1
Polygonaceae	*Rumex pulcher* L.	Homeidha/Assammoumt	Leaves	W	Herb	1
Solanaceae	*Capsicum annuum* L.	Folfol har/ Ifelfelt	Fruit	C	Herb	0.51

W: wild species; C: cultivated species. RCF: relative citation frequency.

Malva sylvestris L. was also mentioned as an essential constituent in the preparation of the **Khobbiz/Lahchich** green dish. This herb gives its name, **Khobbiz** or **Medjir**, to the dish; in some regions of Algeria, the dish is prepared exclusively from its leaves as the green component, together with other non-green ingredients such as barley, olive oil, garlic, and onion. The leaves of *M. sylvestris* L., commonly known as common mallow, are considered a source of energy, containing carbohydrates (≈70 g/100 g), proteins (≈12 g/100 g), and fats (≈3 g/100 g), as well as mucilage, minerals, vitamins, and other bioactive constituents that exert diverse beneficial biological properties (Mousavi *et al.* 2021). The incorporation of this herb into the traditional green dish therefore represents both a cultural and a functional dietary choice. In addition, the mucilage improves the texture of the dish, divulging a soft and slightly viscous appreciated consistency.

Rumex pulcher L. is locally known as locally as *Assammoumt* in relation to its acid flavour, this vernacular name is given also to the *Oxalis pes-caprae* preferred raw by childs and shepherds but don't enter locally in the preparation of **Khobbiz/Lahchich** dish. The species *R. pulcher* L. is an indispensable herb for the green dish in Beni Haoua region and gathered before the growth of the flowering stems. This edible herb contains high level of oxalic acid which reduced after cooking (Bown, 1995). In other Mediterranean countries, *R. pulcher* L. is widely consumed raw or prepared as vegetable in different region of Spain (Blanco-Salas *et al.* 2019; Tardío *et al.* 2005), this common heritage with Spain is attributed mainly to the long common history with north African communities especially during the Islamic period in Iberian peninsula (Andalusia) followed by Spanish occupation of the many Algerian coastal cities.

Scolymus hispanicus L. known as golden thistle is an edible plant used in Beni Haoua region for the preparation of **Khobbiz/Lahchich** green dish where the central nerves of leaves were selected after elimination of prickles and thorns from leaves. The leaves of this herb were considered as a source of phenolic compounds and flavonoids which offer them a wide range of nutraceutical properties (Marmouzi *et al.* 2017). This herb is one of the most highly prized wild vegetables throughout the countries of the Mediterranean Basin, in some regions their flowers were used as saffron substitute to color food, but the leaves are the most used part cooked as stewed vegetable (Sánchez-Mata and Morales, 2016).

This edible herb is widely used for culinary purposes across Algeria. In Beni Haoua region, it is prepared with omelette after prior boiling of the central nerve (Merouane *et al.* 2025). In the Saharan region of El Kantara, the species is traditionally incorporated into cheese-making process (Mechaala *et al.* 2022). In other Mediterranean countries, particularly Spain, the herb is incorporated into a variety of dishes: it is cooked with chickpeas, potatoes, and meat, olive oil with garlic, prepared with scrambled eggs or as omelette, or fried with cured ham or tomatoes, and consumed in salads (Polo *et al.* 2009).

The *Amaryllidaceae* members *Allium cepa* L. and *Allium sativum* L. were vital ingredients in **Khobbiz/Lahchich** since it don't contains any spices. According to the local culinary traditions, these herbs were preferred fresh containing both bulb and green leaves and were regarded as flavor for the dish and healthy food, and introduced in diverse modern and traditional recipes. Onion and garlic are principal vegetables in daily culinary practice within the Mediterranean diet. They play an essential role, as they are widely used to enhance the flavor and aroma of both traditional and modern recipes. In addition, these *Allium* species represent valuable sources of a broad range of bioactive compounds that exert diverse therapeutic effects, along with vitamins and minerals that significantly contribute to their nutritional and health value (Sunanta *et al.* 2023; Sagar *et al.* 2022). In Beni Haoua region, these vegetables are cultivated by families for year-round self-consumption for both culinary and medicinal purposes; their inclusion into the traditional **Khobbiz/Lahchich** dish strengthens its nutraceutical potential.

The mountainous region of Beni Haoua has been characterized by olive cultivation since antiquity, as evidenced by the age of many olive trees. The preparation of olive oil by the local community follows a traditional method: after harvesting, the olives are boiled and then placed in raffia sacks under weights for several days, allowing the bitter exudate to drain. The olives are subsequently transferred into traditional clay containers for manual kneading. During this process, the olive paste is spread along the inner walls of the container, which permits the oil to flow to the bottom. The oil is collected daily, and the kneading process is repeated several times until the olives are exhausted. The remaining paste is then processed further using water extraction to obtain second-quality oil. The first oil produced is distinguished by its unique taste and flavor, and its market price is often higher than that of olive oil from other regions. This high-quality olive oil is widely consumed by the local community, including in the preparation of the **Khobbiz/Lahchich** dish, both during cooking and when served.

Olive oil is a pivotal constituent of the Mediterranean diet and represents an important cultural heritage for these communities. It is a natural product rich in high-value health-promoting compounds, including monounsaturated fatty acids, phenolic compounds, flavonoids, and terpenoids. Olive oil consumption has been shown to improve multiple aspects of human health (Farràs *et al.* 2021).

In addition to the plants agreed upon by all local informants, several wild species including *Beta vulgaris* L., *Daucus carota* subsp. *carota*, *Anisosciadium lanatum* Boiss., *Cynara cardunculus* L., *Taraxacum erythrospermum* Andrz. ex Besser, and *Sonchus oleraceus* L. show variable use among respondents. The variation does not concern their mode of use, but rather whether they are considered essential ingredients in the dish. When these plants are available in the field during gathering, they are collected and incorporated into the preparation; otherwise, the dish is prepared without them. The cultivated species *Capsicum annuum* L. (chili pepper) is included optionally, depending on the desired level of pungency. The addition of these herbs can enhance the dish's organoleptic qualities and contribute to its nutritional and functional value, potentially providing diverse health benefits.

Plant part used

The present survey of ingredients used in the preparation of the **Khobbiz/Lahchich** dish in Beni Haoua district identified five plant part categories: leaves, bulbs, oil, fruits, and seeds (Fig. 4). Leaves constitute the dominant component of the dish (68.8%), reflecting the predominance of herbaceous plants among the ingredients. Bulbs are represented by *Allium* species garlic and onion which are used both as bulbs and as fresh leaves.

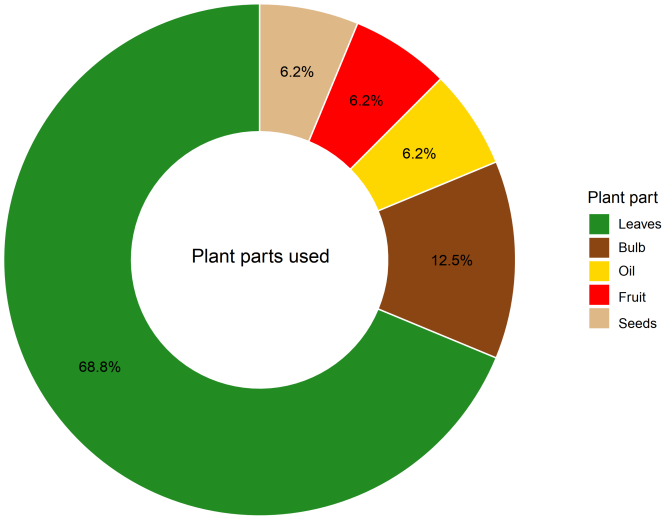

Figure 4. Percentage of edible plant parts used in the preparation of the traditional herbal dish.

A previous ethnobotanical study of wild edible plants in the Chlef province likewise reported leaves as the most commonly consumed plant part among rural communities (Merouane *et al.* 2025). More broadly, Mediterranean culinary traditions are

characterized by the extensive use of leaves, owing to their nutritional value and richness in bioactive compounds (Gori *et al.* 2025).

Growth habits

The analysis of growth habit of plant species used in the cooking of the **Khobbiz/Lahchich** dish in Beni Haoua district is showed in Fig. 5.

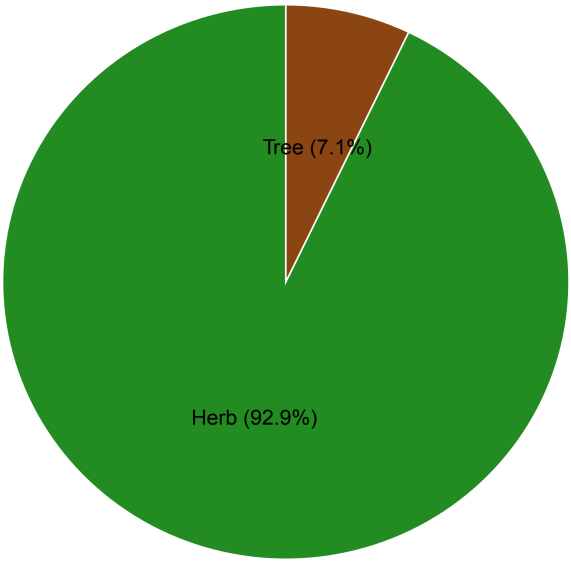

Figure 5. Percentage of Growth habits of plant used in the preparation of the traditional herbal dish.

As shown in Fig. 5, most of the plants used in the preparation of the traditional dish in Beni Haoua region are herbaceous species, with the exception of olive oil, which is derived from a tree growth habit. This dominance explains the green color of the dish and its seasonal preparation during late autumn, winter, and early spring periods characterized by the vigorous growth of green herbaceous plants. Our observation is consistent with a recent ethnobotanical survey on wild edible plants consumed in Chlef Province (Merouane *et al.* 2025).

Status of species (wild/cultivated)

The status of herbal species integrated in the preparation of **Khobbiz/Lahchich** dish in Beni Haoua region is reported in Fig. 6.

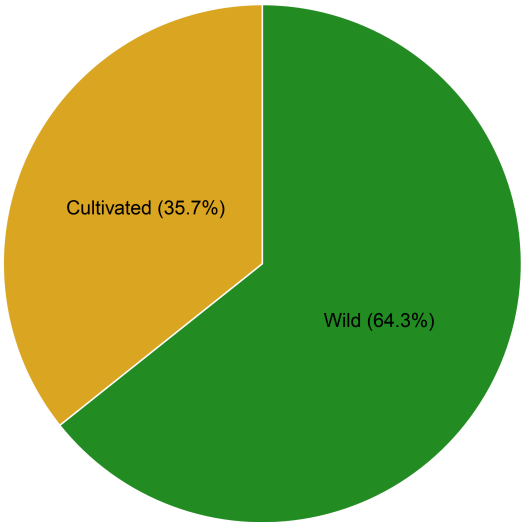

Figure 6. Distribution of recorded plant species used in the preparation of the traditional herbal dish according to their status (wild vs. cultivated).

As shown in Fig. 6, most of the herbal ingredients used in the preparation of the **Khobbiz/Lahchich** traditional dish are wild edible plants, accounting for 64.3%. Our findings are consistent with reports from other Mediterranean regions indicating that the top rated edible plants are of wild origin, such as *Malva sylvestris* L. and *Scolymus hispanicus* L. (Baydoun *et al.* 2023). This pattern may reflect the long history of exchange and shared cultural heritage between the Beni Haoua region and other Mediterranean communities, particularly Spanish and Italian, evidenced by similarities in traditional herbal

knowledge, the presence of common Latin/Spanish words in the local Berber dialect, and the existence of Roman antiquities throughout Beni Haoua area.

Cultivated species, including *Allium sativum* L., *Allium cepa* L., *Olea europaea* L., *Hordeum vulgare* L., and *Capsicum annuum* L., are also regarded by the local community as fundamental components of the dish because of their nutritional and seasoning importance (notably garlic and onion). However, *Capsicum annuum* L. is considered optional and depends on consumer preference.

Conclusion

To the best of our knowledge based on the available literature, this study represents the first scientific report on the indigenous **Khobbiz/Lahchich** dish in Beni Haoua region. Our findings reveal a distinctive culinary heritage characterized by the use of locally available herbal species. More efforts should be undertaken by cultural authorities to recognize and classify this herbal dish, along with its associated traditional knowledge, as part of national and international cultural heritage in order to protect local traditions.

Due to certain limitations of the present study, particularly the relatively small sample size, further researches are needed by involving a larger sample covering the region of Beni Haoua and neighboring populations sharing same culinary traditions. In addition, nutritional analyses are needed to determine the nutrition facts of the traditional dish (energy value, carbohydrates, fats, proteins, fibers, vitamins, and minerals). Finally, efforts by local and authorities are necessary to recognize the **Khobbiz/Lahchich** as part of the national heritage, with the potential for international recognition, in order to preserve and promote the local gastronomic heritage.

Declarations

List of abbreviations: Not applicable.
Ethics approval and Consent to participate: The data were collected in accordance with confidentiality and consent protocols. This study does not involve access to genetic resources and is therefore not subjected to the Nagoya Protocol.
Funding: This research did not receive any specific grant.
Consent for publication: Not applicable.
Availability of data and materials: Not applicable.
Authors' contributions: AM: Designing and supervising the research, interviewing informants.. AAD, HA, MM: drafting the manuscript, data analysis. KA and GG: literature research. MC and AN: revising data analysis and manuscript.
Competing interests: The authors declare that they have no competing interests.

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Literature cited

Agize M, Asfaw Z, Nemomissa S 2025. Ethnobotany of vascular plants use, conservation and management practice in the homegardens by the people of Dawuro in Southwestern Ethiopia. Journal of Ethnobiology and Ethnomedicine 21: 3. doi: 10.1186/s13002-024-00746-0

Baydoun S, Hani N, Nasser H, Ulian T, Arnold-Apostolides N. 2023. Wild leafy vegetables: A potential source for a traditional Mediterranean food from Lebanon. Frontiers in Sustainable Food Systems 6: 991979. doi: 10.3389/fsufs.2022.991979

Blanco-Salas J, Gutiérrez-García L, Labrador-Moreno J, Ruiz-Téllez T. 2019. Wild plants potentially used in human food in the protected area "Sierra Grande de Hornachos" of Extremadura (Spain). Sustainability 11(2): 456. doi: 10.3390/su11020456

Bown D. 1995. Encyclopaedia of Herbs and their Uses. Dorling Kindersley, London, UK.

Climate-Data Organization. 2026. Climate graph and data for Beni Haoua, Chlef, Algeria. https://en.climate-data.org/afrique/algerie/chlef/beni-haoua-321189/#climate-graph (Accessed 1/3/2026).

Cheliff.org. 2026. Villes et villages. http://cheliff.org/portail/?q=glossary/5 (Accessed 1/3/2026).

Dutta S, Kamal Hossain M. 2025. Diversity, distribution patterns, and ethnobotanical utilizations of aromatic plant species in Sitakunda Botanical Garden and Eco-park, Bangladesh. Ethnobotany Research and Applications 31: 1-23. doi: 10.32859/era.31.24.1-23

Farràs M, Almanza Aguilera E, Hernáez Á, Agustí N, Julve J, Fitó M, Castañer O. 2021. Beneficial effects of olive oil and Mediterranean diet on cancer physiopathology and incidence. Seminars in Cancer Biology 73: 178-195. doi: 10.1016/j.semcancer.2020.11.011

García-Henche B, Cuesta-Valiño P, Durán-Álamo P, Penelas-Leguía A. 2024. The role of women in maintaining the heritage value of gastronomy in Castilla-La Mancha. International Journal of Gastronomy and Food Science 37: 100987. doi: 10.1016/j.ijgfs.2024.100987

García Herrera P, Sánchez Mata MC, Cámara M, Fernández Ruiz V, Díez Marqués C, Molina M, Tardío J. 2014. Nutrient composition of six wild edible Mediterranean Asteraceae plants of dietary interest. Journal of Food Composition and Analysis 34(2): 163-170. doi: 10.1016/j.jfca.2014.02.009

Garcia-Oliveira P, Barral M, Carpena M, Gullón P, Fraga-Corral M, Otero P, Prieto MA, Simal-Gándara J. 2021. Traditional plants from Asteraceae family as potential candidates for functional food industry. Food & Function 12(7): 2850-2873. doi: 10.1039/d0fo03433a

GeoNames. 2026. GeoNames geographical database. https://www.geonames.org (Accessed 1/3/2026).

Gori B, Cossu T, El Zein H, Liu U, Ulian T, Bacchetta G. 2025. A comprehensive checklist of Mediterranean wild edible plants: Diversity, traditional uses, and knowledge gaps. Plants, People, Planet. doi: 10.1002/ppp3.70137

Guil-Guerrero JL, Giménez-Giménez A, Rodríguez-García I, Torija-Isasa ME. 1998. Nutritional composition of Sonchus species (S. asper L., S. oleraceus L., and S. tenerrimus L.). Journal of the Science of Food and Agriculture 76: 628-632. doi: 10.1002/(SICI)1097-0010(199804)76:4%3C628::AID-JSFA997%3E3.0.CO;2-U

Lukinac J, Jukic M. 2022. Barley in the production of cereal-based products. Plants 11: 3519. doi: 10.3390/plants11243519

Marmouzi I, El Karbane M, El Hamdani M, Kharbach M, Naceiri Mrabti H, Alami R, Dahraoui S, El Jemli M, Ouzzif Z, Cherrah Y, Derraji S, El Abbes Faouzi M. 2017. Phytochemical and pharmacological variability in Golden Thistle functional parts: comparative study of roots, stems, leaves and flowers. Natural Product Research 31(22): 2669-2674. doi: 10.1080/14786419.2017.1283494

Mechaala S, Bouatrous Y, Adouane S. 2022. Traditional knowledge and diversity of wild medicinal plants in El Kantara's area (Algerian Sahara gate): An ethnobotany survey. Acta Ecologica Sinica 42(1):33-45. doi: 10.1016/j.chnaes.2021.01.007

Merouane A, Cheurfa M, Noui A, Benbeskri A. 2025. The value of wild edible plants among rural communities in Chlef province (Algeria): A quantitative ethnobotanical survey. Ethnobotany Research and Applications 30: 1-18. doi: 10.32859/era.30.63.1-18

Merouane A, Fellag S, Touaibia M, Beldi A. 2022. An ethnobotanical survey of medicinal plants consumed during the holy month of Ramadan in Chlef region, Algeria. Ethnobotany Research and Applications 23: 1-14. doi: 10.32859/era.23.29.1-14

Mousavi SM, Hashemi SA, Behbudi G, Mazraedoost S, Omidifar N, Gholami A, Chiang WH, Babapoor A, Pynadathu Rumjit N. 2021. A review on health benefits of Malva sylvestris L. nutritional compounds for metabolites, antioxidants, and anti-inflammatory, anticancer, and antimicrobial applications. Evidence-Based Complementary and Alternative Medicine 2021: 5548404. doi: 10.1155/2021/5548404

Patti M, Musarella CM, Spampinato G. 2025. Ethnobotanical knowledge in Calabria (southern Italy): A summary review. Heliyon 11: e42050. doi: 10.1016/j.heliyon.2025.e42050

Polo S, Tardío J, Vélez-del-Burgo A, Molina M, Pardo-de-Santayana M. 2009. Knowledge, use and ecology of golden thistle (*Scolymus hispanicus* L.) in Central Spain. Journal of Ethnobiology and Ethnomedicine 5: 42. doi: 10.1186/1746-4269-5-42

Rolnik A, Olas B. 2021. The plants of the Asteraceae family as agents in the protection of human health. International Journal of Molecular Sciences 22(6): 3009. doi: 10.3390/ijms22063009

Sagar NA, Pareek S, Benkeblia N, Xiao J. 2022. Onion (*Allium cepa* L.) bioactives: Chemistry, pharmacotherapeutic functions, and industrial applications. Food Frontiers 3(3): 380-412. doi: 10.1002/fft2.135

Sánchez-Mata D, Morales R. 2016. The Mediterranean landscape and wild edible plants. In: Sánchez-Mata M, Tardío J (eds). Mediterranean Wild Edible Plants. Springer, New York, USA, Pp. 15-31.

Sunanta P, Kontogiorgos V, Pankasemsuk T, Jantanasakulwong K, Rachtanapun P, Seesuriyachan P, Sommano SR. 2023. The nutritional value, bioactive availability and functional properties of garlic and its related products during processing. Frontiers in Nutrition 10: 1142784. doi: 10.3389/fnut.2023.1142784

Tardío J, Pardo-de-Santayana M. 2008. Cultural importance indices: A comparative analysis based on the useful wild plants of Southern Cantabria (Northern Spain). Economic Botany 62: 24-39. doi: 10.1007/s12231-007-9004-5

Tardío J, Pascual H, Morales R. 2005. Wild food plants traditionally used in the province of Madrid, Central Spain. Economic Botany 59: 122-136. doi: 10.1663/0013-0001(2005)059[0122:WFPTUI]2.0.CO;2

Tardío J. 2010. Spring is coming: The gathering and consumption of wild vegetables in Spain. In: Pardo-de-Santayana M, Pieroni A, Puri R, (eds). Ethnobotany in the new Europe: People, health and wild plant resources. Berghahn Books, Pp. 233-276.

Ullrich SE. 2011. Significance, adaptation, production, and trade of barley. In: Ullrich SE, (ed). Barley: Production, improvement, and uses. Blackwell Publishing Ltd., West Sussex, UK, Pp. 3-13.