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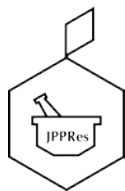
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# Traditional use of medicinal plants in a city at steppic character (M'sila, Algeria)

[Uso tradicional de plantas medicinales en una ciudad con carácter estepario (M'sila, Argelia)]

Madani Sarri<sup>a,b\*</sup>, Fatima Zahra Mouyet<sup>a</sup>, Meriem Benziane<sup>a</sup>, Amina Cheriet<sup>a</sup>

<sup>a</sup>Department of Nature Sciences and Life, Faculty of Sciences, M'sila University, 28000 M'sila, Algeria.

<sup>b</sup>Laboratory of Phytotherapy Applied to Chronic Diseases, Faculty of Nature Sciences and Life, Setif 1 University, 19000 Setif, Algeria.

\* E-mail: [Mad\\_sari@yahoo.fr](mailto:Mad_sari@yahoo.fr)

## Abstract

**Context:** M'sila city occupies a privileged position in the central part of northern Algeria. The climate of this area is continental, subject in part to the Saharan influences of which vegetation is steppic.

**Aims:** Highlight traditional usage of plants despite environmental characteristics.

**Methods:** An ethnobotanical survey in the city of M'sila was conducted during the period 2011-2012 in collaboration with traditional practitioners, herbalists and healers. A total of 85 adults were able to determine the species and answer questions about the traditional use of plants in artisanal processing, nutritional and medicinal domains.

**Results:** Medicinal plants recorded in the city of M'sila were 36 divided into 16 families and 31 genera. Lamiaceae family predominates (27.8%), followed by Asteraceae (13.9%). Leaves are the most frequently used (27.4%), the aerial parts (18.5%) and thus the seeds (16.3%). It appears that the population is highly dependent on these plants that allow them to treat different pathologies (digestive, stomach, diarrhea, constipation, vomiting) with a percentage (18.6%), carminative (5.7%) and antidiabetic (12.2%). In general, the remedies are administered orally. Indeed, therapeutic use forms are: the tisane or decoction (44.7%), infusion (27.1%) and powder (12.2%).

**Conclusions:** The ethnobotanical survey conducted among traditional healers, herbalists and healers in the M'sila city has created an inventory of 36 species and a database that collected all the information on local and traditional therapeutic applications as well as all the diseases treated.

## Resumen

**Contexto:** La ciudad de M'sila ocupa una posición privilegiada en la parte central del norte de Argelia. El clima de esta zona es de tipo continental, con la influencia del Sahara, y la vegetación es de estepa.

**Objetivos:** Destacar el uso tradicional de las plantas, a pesar de las características ambientales.

**Métodos:** Un estudio etnobotánico se llevó a cabo en la ciudad de M'sila durante el período 2011-2012, en colaboración con los médicos tradicionales, herbalistas y curanderos. Un total de 85 adultos fueron capaces de determinar las especies y responder preguntas sobre el uso tradicional de las plantas en procesos artesanales y los dominios nutricionales y medicinales.

**Resultados:** Las plantas medicinales registradas fueron 36, divididas en 16 familias y 31 géneros. La familias más utilizadas son Lamiaceae (27,4%), seguida de Asteraceae (13,9%). Las partes de las plantas más utilizadas son las hojas (27,4%), las partes aéreas (18,5%) y después las semillas (16,3%). Al parecer la población es muy dependiente de estas plantas. El 18,6% manifestó que les permiten el tratamiento de diferentes patologías (digestivas, estomacales, diarrea, estreñimiento, vómitos), carminativo (5,7%) y antidiabético (12,2%). En general, los remedios se administran por vía oral. Las formas de uso terapéutico más usadas son: la tisana o decocción (44,7%), La infusión (27,1%) y el polvo (12,2%).

**Conclusiones:** El estudio etnobotánico realizado entre los curanderos tradicionales, herbalistas y sanadores en la ciudad M'sila ha creado un inventario de 36 especies y una base de datos que recoge toda la información sobre las aplicaciones terapéuticas locales y tradicionales, así como todas las enfermedades tratadas.

**Keywords:** Ethnobotany; ethnopharmacological; therapeutic applications.

**Palabras Clave:** Etnobotánica; etnofarmacología; aplicaciones terapéuticas.

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## INTRODUCTION

Medicinal plants are valuable resources for the vast majority of rural populations in Africa, where more than 80% of the population uses them to provide health care (WHO, 2002).

M'sila by its position in Algeria, offers a great ecological diversity (steppe ecosystem that dominates) and flora (steppe vegetation occupies almost 20% of the total area). This area is characterized by a traditional herbal knowledge. Currently, our goal is to preserve and enhance traditional uses through ethnobotanical surveys that contribute, their part, together and form a very valuable source of information, ready to be exploited scientifically. In this sense, an ethnobotanical study aims to highlight the role of herbal medicine in the traditional system of care at the M'sila city, located in the North East of Algeria.

## MATERIAL AND METHODS

### Study area

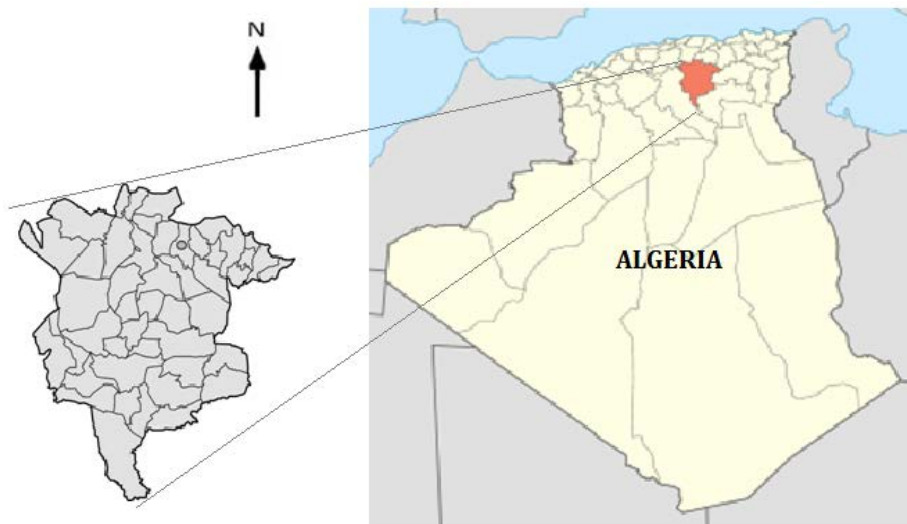
M'sila occupies a privileged position in the central part of northern Algeria (Fig. 1). Overall, it is part of the region of the Central Highlands and extends over an area of 18 718 km<sup>2</sup>. It is composed of 47 municipalities grouped in 15 daïras.

M'sila area is at an altitude of 500 m, is situated between 35°42'07"N, 4°32'49"E (Moreau et al., 2005). The climate of the investigation area is continental, subject in part to the Saharan influences. Summer is hot and dry while the winter is very cold, with low rainfall is irregular, it is of the order of 100 to 250 mm/year and with an average annual temperature of 15.8 °C (Le Houerou, 1995).

The vegetation is characterized by a predominance of steppe that covers 63% of the total area and an area designated to agriculture representing 20% of total area consecrated essentially to the cereals, arboriculture and market gardening (FAO, 1996). The inhabitants of M'sila represent an ethnic weaving varied Arab and Berber related to modes of semi-nomadic and nomadic life. Agro-pastoralism is the main activity of the majority of inhabitants.

### Plant material

Plants samples were collected and validated by identification keys systematic (Ozenda 1983; Quezel and Santa 1962-1963) and botanists of the Faculty of the M'sila University and herbarium of the department of natural sciences and life. For each species studied, herbarium specimens were made carefully and preserved in the laboratory of the department.



**Figure 1.** Map of the study area (M'sila city, Algeria). (WorldMapFinder.com)

## Ethnobotany

To improve knowledge on the use of plants cultivated or spontaneous an ethnobotanical survey in the city of M'sila was conducted during the period 2011-2012 in collaboration with traditional practitioners, herbalists and healers. All investigations described the information about: date, research area (district, village), informants (name, age, sex, educational level), scientific name of plant, local name of plant, part of the plant used, usage purpose of the plant, dosage, how to use it (decoction, infusion, etc.), usage period of the plant, side effects of the plant.

A total of 85 adults, 50 women and 35 men, 10 of them are recognized as traditional healers were able to determine the species and answer questions about the traditional use of plants in artisanal processing, nutritional and medicinal domains.

## RESULTS AND DISCUSSION

The general analysis of the questionnaires allowed us to confirm the significant dependence of the local population towards medicinal plants to treat various diseases. At the end of our survey, we collected information on a total of 100 question cards and we investigated 85 persons including 50 women (Table 1).

The majority of respondents have an educational level (primary, medium and secondary), with a percentage of 61.2% against 21.2% illiterate; also, pretty striking, result remains the people with university level (Table 1).

According to the flora of Algeria (Quezel and Santa, 1962-1963) all species listed in Table 2 are spontaneous with the exception of the following species which are sub-spontaneous (*Origanum majorana*, *Trigonella fenum graecum*, *Glycyrrhiza glabra*, *Lepidium sativum*, *Cuminum cyminum*) and we records cultivated species not included in the Algerian flora as: *Zingiber officinale*, *Pimpinella anisum*, *Carum carvi*, *Eugenia caryophyllus*, *Triticum vulgare*, *Ailanthus glandulosa*, *Sesamum indicum*. The *Origanum glandulosum* is the only Algerian-Tunisian endemic species listed in our study area despite the fact that the Algerian endemic flora includes 247 species (Quezel, 1964).

**Table 1.** The socio-demographic characteristics of the interviewees (n =85)

Characteristics	Number of interviewees		Total percentage (%)
	Male	Female	
<b>Sex</b>			
Male	35		41.2
Femele		50	58.8
<b>Age (years)</b>			
20-30	4	10	16.5
31-40	7	10	20.0
41-50	10	3	15.3
51-60	3	9	14.1
61-70	9	15	28.2
>71	2	8	11.8
<b>Education level</b>			
Illiterate	0	18	21.2
Primary	12	9	24.7
Medium	9	4	15.3
Secondary	7	11	21.2
University	7	8	17.6

Medicinal plants identified in the study area are in number 36 belonging to 16 families and 31 genera (Table 2). Lamiaceae family was dominant (27.8%), followed by Asteraceae (13.9%). We observe that the leaves are the most frequently used (27.4%), the aerial parts (18.5%) and thus the seeds (16.3%). This is consistent with results of several studies which report that the leaves are frequently used in medicinal recipes (Azzi et al., 2012; Mehdioui and Kahouadji, 2007).

The ethnobotanical survey driving in the city of M'sila allowed us to identify a number of processed herbs and diseases showing that the population is highly dependent on these plants that allow them to treat various diseases such as: digestive difficulty, stomach pain, diarrhea, constipation, vomiting with a percentage (18.6%), as carminative (5.7%) and antidiabetic (12.2%).

Generally, medicines are administered orally. Indeed, several preparation methods are used to facilitate the administration of plants to patients.

**Table 2.** List of medicinal plants in the M'sila city (Algeria)

Botanic family	Scientific name	Local name	Used part / treatment	Method of use	Citation
Lamiaceae	<i>Rosmarinus officinalis</i> L.	Aklil	Aerial part / carminative, antispasmodic, liver dysfunction, diabetes, cough, stomach and head, bactericidal, antiseptic for acne.	Decoction, tisane, fumigation, bath, powder	6
	<i>Origanum glandulosum</i> Desf	Zaater	Aerial part / rheum, pain of menstruation, pelvic infection, cough, carminative.	Decoction, tisane, fumigation, powder	4
	<i>Marrubium vulgare</i> L.	Temeriuait	Aerial part / diarrhea, fever, rheum, nausea, headache, antidiabetic, antihypertensive, hepatic stimulant.	Decoction, tisane	4
	<i>Mentha spicata</i> L. em. Huds	Naanaa	Aerial part / antispasmodic, hypotensive, analgesic teeth, emmenagogue, anthelmintic.	Decoction, tisane, fresh (raw)	4
	<i>Mentha pulegium</i> L.	Fliou	Aerial part / vomiting, diarrhea, abdominal pain, cough, analgesic teeth.	Decoction, tisane, bath	3
	<i>Lavandula officinalis</i> Chaix.	El khouzama	Aerial part / antispasmodic, flu, stomach pain, infection of the genital tract.	Decoction, tisane, powder	2
	<i>Origanum majorana</i> L.	Mardgouche	Leaves / head pains, digestive disorders, inflammation of the mouth.	Decoction, tisane, fumigation	1
	<i>Ajuga iva</i> L. (Schreb).	Chendgoura	Aerial part / facility for kidney dialysis, antiseptic.	Decoction, tisane	1
	<i>Teucrium polium</i> L.	Khiata	Aerial part / diarrhea.	Decoction	1
	<i>Lavandula stoechas</i> L.	Halhal	Aerial part / analgesic teeth	Infusion	1
Astereaceae	<i>Artemisia herba alba</i> Asso.	Chih	Whole plant / diabetic, antispasmodic, anthelmintic, carminative, colopathy, nausea, abdominal analgesic and analgesic of the breast.	Decoction, tisane, powder, mastication	13
	<i>Anthemis arvensis</i> L.	Baboundj	Flowers / bactericidal, anthelmintic, analgesic rules, convulsion, stomach, inflammation of the throat.	Decoction, tisane, fumigation	4
	<i>Santolina rosmarinifolia</i> L.	Jaeda	Leaves / colon, abdominal pain, carminative, anthelmintic, fever.	Decoction, fumigation, powder	3
	<i>Artemisia campestris</i> L.	Tgofet	Leaves / digestive disorders, stomach aches.	Decoction, tisane	2
	<i>Artemisia absinthium</i> L.	Chadjret meriem	Leaves / hypertensive, appetizer, vulnerary.	Infusion, decoction, bath	1
Fabaceae	<i>Glycyrrhiza glabra</i> L.	Arq essous	Roots / inflammation of the eyelids, pectoral diseases and thorax, inflammation of the oral tract.	Decoction, tisane, powder	4
	<i>Trigonella fenum graecum</i> L.	Helba	Seeds / appetizer, anthelmintic, genital infection, milk production in lactating women.	Decoction, tisane, powder	4
	<i>Cassia aschreek</i> Forsk.	Senna maky	Leaves / constipation, headaches.	Decoction, tisane	3
Cupressaceae	<i>Juniperus oxycedrus</i> L.	Aaraar	Aerial part / eczema, diarrhea, antihelminthic, cough, stomach pain, chest pain, carminative, urinary tract inflammation.	Decoction, tisane, powder	5
	<i>Quercus ilex</i> L.	El Aafsa	Seeds / aesthetic hair, gingiva	Powder	1
Zingiberaceae	<i>Alpinia galanga</i> L.	Khodjlane	Roots / abdominal pain, vomiting, genital infection, nausea, vaso-dilators.	Decoction	3
	<i>Zingiber officinale</i> Roscoe.	Zendjabil	Roots / carminative, rheum, relaxation, analgesic head.	Decoction, tisane	2
Zygophyllaceae	<i>Peganum harmala</i> L.	Harmel	Seeds / abdominal analgesic and knees, vertigo	Decoction, tisane, fumigation, powder	5
Brassicaceae	<i>Lepidium sativum</i> L.	Hab el rachad	Seeds / broken bones, anemia, anthelmintic, fatigue, hair loss, hypoglycemic for women after childbirth.	Decoction, tisane, bath, powder	5
Apiaceae	<i>Pimpinella anisum</i> L.	Yansoun	Seeds / abdominal bloating, carminative, sedative, digestive disorders.	Decoction, fumigation	2
	<i>Carum carvi</i> L.	Karwia	Seeds / carminative, antiseptic, stimulant	Decoction	1
	<i>Cuminum cyminum</i> L.	Kemmoun	Seeds / abdominal pain, emmenagogue.	Decoction, tisane	1
Rutaceae	<i>Ruta chalepensis</i> L.	Fidjel	Aerial part / diarrhea, vomiting, breast tumors	Infusion	3
Liliaceae	<i>Asphodelus microcarpus</i> Salzm. et Vir.	Belouaz	Fruits/ diuretic, antirheumatic, otitis, toothache.	Decoction	2
Myrtaceae	<i>Myrtus communis</i> L.	Rihan	Leaves / eczema, hypotensive, skin diseases	Powder, decoction	2
	<i>Eugenia caryophyllus</i> (Spreng.) Bullok & S.G. Harrison	Kronfel	Clove / antipyretic, antiseptic, anesthetic, analgesic teeth.	Decoction, tisane	1
Poaceae	<i>Triticum vulgare</i> Vill.	El gamh	Seeds / giving energy.	Powder	1
Rhamnaceae	<i>Ziziphus lotus</i> (L) Desf.	Sedra	Leaves / hair loss.	Bath, infusion, lotion	1
Simaroubaceae	<i>Ailanthus glandulosa</i> Desf.	Lissane el tayer	Leaves / vermifuge.	Decoction, tisane	1
Pedaliaceae	<i>Sesamum indicum</i> L.	Djeldjlane	Seeds / asthma, appetizer, digestive	Powder	1
Thymelaeaceae	<i>Thymelaea hirsuta</i> End.	Methnane	Aerial part / migraine, hair loss.	Decoction, tisane	1



In our study, tisane or decoction are the most used (44.7%), followed of infusion (27.1%) and powder (12.2%). It is often reported that the decoction collects the most active substances and mitigates or cancels the toxic effect of certain ailments (Sari et al., 2012a; 2012b; Sahli et al., 2010). Some species have a clear dominance of traditional use as *Artemisia herba alba* Asso., *Rosmarinus officinalis* L., *Lepidium sativum* L., and *Peganum harmala* L. (Table 2).

The medicinal plant species recorded in M'sila city are also used as remedies in other parts of Algeria. It is noted that *Artemisia herba alba* and *Marrubium vulgare* in this study have a popularity for treating diabetes. Furthermore, research work conducted in other area of Algeria showed that some plants mentioned in our investigation area have different traditional uses (Allali et al., 2008; Sari et al. 2006). Therefore, our objective is to enhance these practices cited by ethnopharmacological tests and cites here *Marrubium vulgare* species that has shown considerable anti-diabetic activity (Boudjelal et al., 2012).

## CONCLUSIONS

The ethnobotanical survey conducted among traditional healers, herbalists and healers in the M'sila city has created an inventory of 36 species and a database that collected all the information on local and traditional therapeutic applications as well as all the diseases treated being the Laminaceae family the most cited and the leaves the part most frequently used. Tisane or decoction were the most used to treat digestive illness, principally.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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