

# Inventory, diversity and therapeutic uses of medicinal plants in the Tiaret Mountains (western Algeria)

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## ABSTRACT

This study is devoted to the floristic (systematic, biology, chorology) and therapeutic (treated uses and diseases) analysis of medicinal plants in the Tiaret Mountains (western Algeria). The floristic inventory allowed us to identify 108 medicinal plants belonging to 41 families, including the dominance of the Asteraceae, Lamiaceae, Fabaceae and Orchidaceae with (15.7%, 7.4%, 5.6%, 5.6%) respectively. Also we identified 3 endemic, 4 rare and 8 protected species. The biological spectrum of these species is characterized by a high presence of the Therophytes (38%) followed by the Phanerophytes (20.4%). In biogeographical terms, Mediterranean biogeographical species are the most represented and make up more than half of the medicinal flora (52.8%). These plants are mainly used in order of importance in the treatment of the digestive tract, cardiovascular and dermal diseases with percentages of 18.6%, 10.7%, 7.5%.

## KEY WORDS

Floristic analysis; Inventory; Medicinal plants; Therapeutic uses; Tiaret Mountains.

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## INTRODUCTION

Medicinal plants are still a source of medical care in developing countries (Rebbas & Bounar, 2014). A large majority (70–80%) of people in Africa consult traditional medicine practitioners (TPMs) for health care (Cunningham, 1993). Algeria is a typical example and one of the countries with a long medical tradition and a knowledge of medicinal plants (Baba-Aissa, 1991), some of these plants are used by residents living in the area and are marketed by herbalists (Benaissa et al., 2018). But according to (Rebbas et al., 2012), the use of conventional medicine has led to the neglect of these ancestral practices, which risk being forgotten. However, this country remains poorly explored, even though it encompasses considerable natural re-

sources distributed in different ecosystems and has considerable floristic diversity (Miara et al., 2019). In this context, the aim of this study is to identify and enhance the medicinal plants of the Tiaret mountains by their floristic analysis and their uses in traditional medicine.

## MATERIAL AND METHODS

### *Study area*

Our study area is an integral part of the Tiaret Mountains, western Algeria (Fig. 1), which are located in the north of the department (Wilaya) and embracing the city of Tiaret in the south, they are between 700 and over 1200 meters high. The bio-

climate goes from semi-arid to cool winters, however, this bioclimatic area overflows towards the arid at low altitudes and the subhumid at the highest peaks (Miara et al., 2016). The soil of the region is characterized by a sandy texture, which is most often decarbonated. This would come from the dominant geological nature of the region (Miara et al., 2012).

### **Sampling**

Two hundred floristic surveys were carried in the optimum period of vegetation (March-June) during the years 2015–2018 following stratified sampling according to Gounot (1969) by listing all species present with a minimum surface area of 100 m<sup>2</sup>, the latter seems sufficient for the plant formations studied (Dahmani, 1997).

The identification of taxa was made from the flora of Quèzel & Santa (1962–1963) updated by the index of Dobignard & Chatelain (2010–2013). Biological types of species are performed using the notion of Raunkiaer (1934).

### **Medicinal plants**

To select medicinal species and their traditional uses we have used the works of medicinal plants in the region of Algeria (Baba-Aissa, 1991; Beloued, 2005) and other various scientific articles on ethnobotanical studies carried in the country (Rebbas et al., 2012; Boudjelal et al., 2012; Miara et al., 2013; Hachemi et al., 2013; Cherma & Gharzouli, 2015).

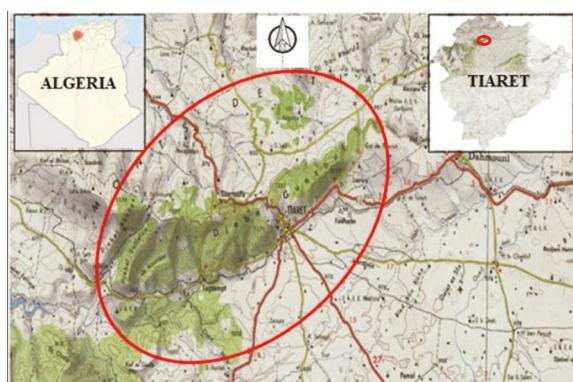


Figure 1. Location of the study area:  
Tiaret Mountains (western Algeria).

## **RESULTS AND DISCUSSION**

### **Floristic composition**

The analysis of the inventoried flora (300 species in total) provided a list of 108 medicinal plant divided into 85 genera and 41 botanical families (Fig. 2). The richest families in species are Asteraceae (17; 15.7%), Lamiaceae (8; 7.4%), Fabaceae and Orchidaceae (6; 5.6%), Boraginaceae and Plantaginaceae (5; 4.6%), Apiaceae and Cistaceae (4; 3.7%). The rest of the families are poorly represented with percentages that vary between them (3, 2 and 1 species; 2.8%, 1.9% and 0.9% respectively).

### **Biological types**

The classification of species by biological types was marked by the dominance of the Therophytes (41; 38%) followed by Phanerophytes (22; 20.4%), Hemicryptophytes (18; 16.7%) then Chamaephytes (16; 14.8%) and finally the Geophytes (11; 10.2%) (Fig. 3).

The high representation of Therophytes reveals high anthropogenic pressure (Daget 1980), but these annual plants are widely used by the population and have a socio-economic role (Hachemi et al., 2013). Phanerophytes represented by trees and shrubs often semperfervens have a significant percentage explained by their presence over time by their roots, branches and leaves (Miara et al., 2013).

### **Biogeographic types**

Based on the analysis of the chorological types, we observe the predominance of Mediterranean biogeographical species (57; 52.8%), one of the characteristics of the typical Mediterranean flora (Miara et al., 2017). Secondly, come the western Mediterranean elements (11; 10.2%), followed by the Euro-Mediterranean (9; 8.3%), the Cosmopolitans (7; 6.5%), Eurasians (6; 5.6%), then the Mediterranean Canaries, North African Endemics, Europeans, Ibero-Mauritanian, Atlantic Mediterranean and Sub Mediterranean with the same number of species (2; 1.9%). The remainder of the species represent low participation (one species), but contribute to the diversity and richness of the plant potential of the study area (Fig. 4).

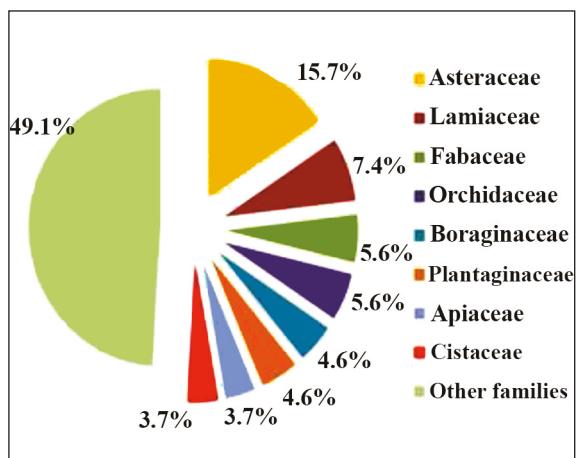


Figure 2. Composition of medicinal plants by family.

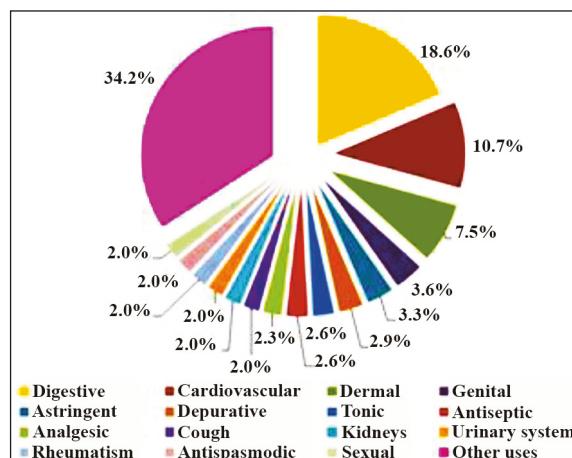


Figure 5. Diseases treated by medicinal plants.

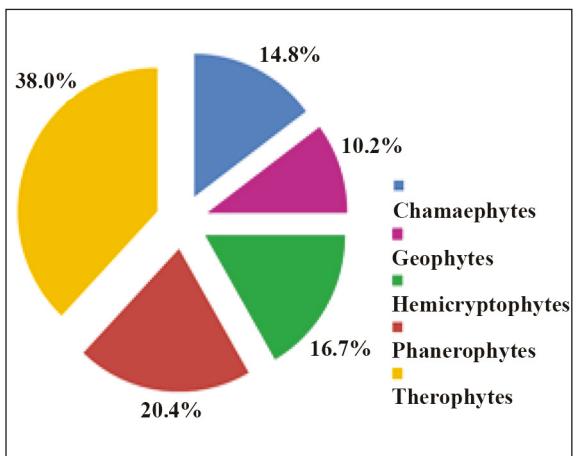


Figure 3. Biological spectrum of medicinal plants.

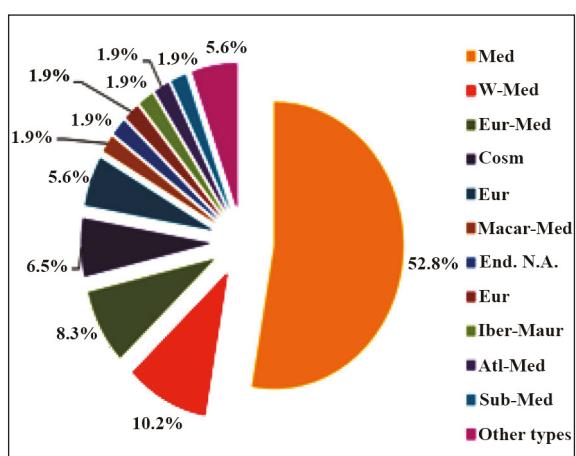


Figure 4. Chorological spectrum of medicinal plants.

### Endemic, rare and protected plants

The medicinal flora of the Tiaret Mountains is characterized by the presence of two (2) endemic species of the North African (End N.A.) *Helianthemum ledifolium* subsp. *apertum* (Pomel) Raynaud ex Greuter & Burdet and *Thymus ciliatus* (Desf.) Benth. subsp. *ciliatus* and one (1) endemic species Algeria-Tunisia (End Alg-Tun) *Origanum vulgare* subsp. *glandulosum* (Desf.) Letsw.

The analysis of species rarity showed the existence of one (1) quite rare (QR) species *Orchis papilionacea* L. and three (3) rare (R) species *Blackstonia perfoliata* subsp. *grandiflora* (Viv.) Mayor, *Phillyrea angustifolia* L. and *Quercus suber* L.

According to Executive Decree No. 12-03 of 10 Safar 1433 corresponding to 4 January 2012 fixing the list of protected non-cultivated plant species, eight (08) protected species have been inventoried: *Bellis prostrata* Pomel, *Gagea algeriensis* Chabert, *Juniperus oxycedrus* L., *Orchis olbiensis* Reut. ex Gren, *Orchis papilionacea* L., *Otocarpus virgatus* Durieu, *Pistacia atlantica* Desf. and *Tetraclinis articulata* (Vahl) Mast.

These species are grouped in Table 1.

### Therapeutic uses

The analysis of the types of diseases treated by the inventoried medicinal plants shows that the majority of these plants are used in the treatment of the digestive tract (18.6%), notably stomach and

colon colic, intestinal disease, etc., cardiovascular diseases such as hypertension, heart disease, etc., comes secondly with 10.7%, while dermal disease care such as (skin irritations and eczema) is recommended by several species and comes thirdly (7.5%). These results are in line with the observations of Miara et al. (2013), Benarba et al. (2015), Chermat & Gharzouli (2015), Ouelbani et al. (2016), and Bouasla & Bouasla (2017). Genital diseases are treated at a rate of 3.3%, while many species have astringentes properties (3.6%), other depuratives (3%), tonic and antiseptic (2.6%) and even analgesic (2.3%).

Other diseases treated are: cough, kidney diseases, urinary system diseases, rheumatism, spasms and sexual disability in men with the same percentage (2%) each. In addition, a low recommendation of these plants (less than 2%) for the care of various diseases such as: diabetes, liver diseases, respiratory diseases, tonsillitis, bronchitis, migraine

and forms a percentage of 34.2% in total (Fig. 5, see also Table 2).

## CONCLUSIONS

The inventory of medicinal plants in the Tiaret Mountains shows a great diversity with immense therapeutic virtues for the treatment of common diseases and certain chronic diseases such as diabetes and hypertension.

So this work could provide useful information on each of the these plants that will make it possible to use their in the field of pharmacology.

For this purpose, plant chemical and pharmacological studies should be undertaken in the future to create an economic activity around the use of these plants in an organized and respectful environment to the preservation of endemic, rare and protected species.

Taxa	Endemism	Rarity	Protection (ED)
<i>Bellis prostrata</i> Pomel			P
<i>Blackstonia perfoliata</i> subsp <i>grandiflora</i> (Viv.) Maire		R	
<i>Gagea algeriensis</i> Chabert			P
<i>Helianthemum ledifolium</i> subsp. <i>apertum</i> (Pomel) Raynaud ex Greuter & Burdet	End N.A		
<i>Juniperus oxycedrus</i> L.			P
<i>Orchis olbiensis</i> Reut. ex Gren.			P
<i>Orchis papilionacea</i> L.		QR	P
<i>Origanum vulgare</i> subsp. <i>glandulosum</i> (Desf.) Ietsw	End Alg-Tun		
<i>Otocarpus virgatus</i> Durieu			P
<i>Phillyrea angustifolia</i> L.		R	
<i>Pistacia atlantica</i> Desf.			P
<i>Quercus suber</i> L.		R	
<i>Tetraclinis articulata</i> (Vahl) Mast			P
<i>Thymus ciliatus</i> (Desf.) Benth. subsp. <i>ciliatus</i>	End. N.A		

Table 1. List of endemic, rare and protected medicinal plants from the study area: Tiaret Mountains (western Algeria). End N.A: Endemic North. African; End Alg-Tun : Endemic Algeria-Tunisia; QR: Quite rare; R: Rare. P: Protected; ED: Executive Decree.

TAXA	BIO-LOGY	CHORO-TYPE	THERAPEUTIC USE
ANACARDIACEAE			
<i>Pistacia atlantica</i> Desf.	PH	N.A-SICILY	Astringent, stomach diseases, coughs and colds
<i>Pistacia lentiscus</i> L.	PH	MED	Colon and stomach colic, stomach ulcer and varicose veins
<i>Pistacia terebinthus</i> L.	PH	MED	Genital diseases, colon
APIACEAE			
<i>Daucus carota</i> subsp <i>maximus</i> (Desf.) Batt.	HE	MED	Visual acuity, jaundice, in various states of nervous exhaustion, also for pinworm in children
<i>Eryngium campestre</i> L.	HE	EUR-MED	Disorders of the bladder and kidneys, urinary affections, cough and bronchitis
<i>Ferula communis</i> L.	CH	MED	Migraine
<i>Thapsia garganica</i> L	HE	MED	Rheumatic pains, in cases of pulmonary diseases
APOCYNACEAE			
<i>Nerium oleander</i> L.	PH	MED	Dermatology (scab, eczema), for bowel disorders
ARECACEAE			
<i>Chamaerops humilis</i> L	CH	W-MED	Diabetes, decreases the level of total cholesterol and triglycerides
ASPARAGACEAE			
<i>Asparagus acutifolius</i> L.	GE	MED	Stomachic and diuretic, cardiovascular diseases
<i>Asparagus albus</i> L.	GE	W-MED	Jaundice and rheumatism, appetizer and stomachic
<i>Drimia maritima</i> (L.) Stearn	GE	MACAR-MED	Heart failure and reduced kidney activity
ASTERACEAE			
<i>Anacyclus clavatus</i> (Desf.) Pers	TH	EUR-MED	Skin and difficult digestion
<i>Anacyclus pyrethrum</i> (L.) Link	HE	IBERO-MAUR	Used mostly externally, toothache, paralyzed tongue and to excite abundant salivation
<i>Bellis annua</i> L. subsp. <i>annua</i>	TH	MED	Analgesic, anti-inflammatory, diuretic
<i>Bellis sylvestris</i> L.	TH	MED	Analgesic, anti-inflammatory, diuretic
<i>Calendula arvensis</i> (Vaill.) L.	TH	MED	Depurative, emmenagogues, antispasmodic and stimulating
<i>Calendula suffruticosa</i> subsp. <i>boissieri</i> Lanza	TH	MED	Antiseptic, constituents are fungicidal, antibacterial and antiviral, healing action
<i>Centaurea calcitrapa</i> L.	HE	MED	Tonic, fabrifuges, diuretic
<i>Centaurea pullata</i> L.	TH	MED	Increase the pressure
<i>Cichorium intybus</i> L.	HE	COSM	Slightly tonic, stomachic, depurative, regulating cholagogue of the gastrointestinal tract
<i>Echinops spinosus</i> subsp. <i>eu.spinosus</i> Greuter	HE	S-MED-SAH.	Labor pains, abortion, neuralgia
<i>Helichrysum stoechas</i> (L.) Moench	CH	W-MED	Helminth infections, anti-dandruff
<i>Pallenis spinosa</i> (L.) Cass. subsp. <i>spinosa</i>	CH	EUR-MED	Antidiabetic, anti-inflammatory
<i>Reichardia picroides</i> (L.) Roth	TH	MED	A little diuretic
<i>Scolymus maculatus</i> L.	HE	MED	Liver diseases and intestines
<i>Senecio vulgaris</i> L.	TH	SUBCOSM	Emmenagogue
<i>Silybum Marianum</i> L.	HE	MED	Appetizers, tonic, fabrifugal and resolutive, diseases of the liver, spleen, jaundice and chronic constipation
<i>Sonchus tenerrimus</i> L. subsp. <i>tenerrimus</i>	TH	MED	Depurative

TAXA	BIO-LOGY	CHORO-TYPE	THERAPEUTIC USE
BORAGINACEAE			
<i>Anchusa azurea</i> Mill.	TH	EUR-MED.	Antitumor, anti-inflammatory, wound-healing
<i>Borago officinalis</i> L.	TH	W-MED	As temperamental in burning, bilious and eruptive fever, in engorgements of the liver
<i>Cynoglossum cheirifolium</i> L.	TH	MED	Astringent, diarrheal, soothing
<i>Cynoglossum creticum</i> Miller	HE	MED	Astringent, diarrheal, soothing
<i>Echium plantagineum</i> L.	TH	MED	Diuretic
BRASSICACEAE			
<i>Capsella bursa-pastoris</i> (L.) Medik.	TH	MED	Astringent, against diarrhea and dysentery, uterine haemorrhages, to women whose periods are repeated too frequently or for too long
<i>Lobularia maritima</i> (L.) Desv.	TH	MED	Febrifuge
<i>Sinapis arvensis</i> L.	TH	PALEO TEMP	Increases the secretion of the intestinal mucosa
CAMPANULACEAE			
<i>Campanula rapunculus</i> L.	TH	EUR-MED.	Antiseptic, tonic, used especially for the treatment of tonsillitis
CAPRIPHOLIACEAE			
<i>Lomelosia stellata</i> L.	TH	W-MED	Treatment of fevers for children
<i>Lonicera implexa</i> Aiton	PH	MED.	Astringent, sudorific, diuretic
Caryophylaceae			
<i>Paronychia argentea</i> Lam.	TH	MED	Diuretic, aseptic and slightly spasmodic. Treatment of inflammation of the urinary tract, kidneys and gall bladder
<i>Stellaria media</i> (L.) Vill.	TH	COSM	Skin irritations, severe itching, eczema, ulcers
CISTACEAE			
<i>Cistus creticus</i> subsp. <i>eriocephalus</i> (Viv.) Greuter & Burdet	CH	MED	Aperitif, used as an aphrodisiac
<i>Cistus monspeliensis</i> L.	CH	MED	Aperitif, used as an aphrodisiac
<i>Cistus salvifolius</i> L.	CH	MED	Aperitif, used as an aphrodisiac
<i>Helianthemum ledifolium</i> subsp. <i>apertum</i> (Pomel) Raynaud ex Greuter & Burdet	TH	END N.A	Lactation, irregular cycle
CONVOLVULACEAE			
<i>Convolvulus althaeoides</i> L.	HE	MED.	Antispasmodic, stomachic, tonic, purgative
CRASSULACEAE			
<i>Umbilicus horizontalis</i> (Guss.) DC.	HE	ATL-MED	Healing, emollient
CUPRESSACEAE			
<i>Cupressus sempervirens</i> L.	PH	MED	Stimulant, diuretic, stomach tonic, pulmonary antiseptic and depurative, disorders of the venous system, in the treatment of varicose veins
<i>Juniperus oxycedrus</i> L.	PH	IBERO-MAUR	Stimulating, diuretic, stomach tonic, pulmonary antiseptic and depurative, against skin diseases (eczema, psoriasis ...) and as a vermifuge
<i>Tetraclinis articulata</i> (Vahl) Mast	PH	MED	Intestinal and respiratory infections. In external use is applied to the umbilical wound of newborns for scarring. Dental care, digestive disorders, nausea, respiratory problems, fever

TAXA	BIO-LOGY	CHORO-TYPE	THERAPEUTIC USE
ERICACEAE			
<i>Arbutus unedo</i> L.	PH	MED	Antiseptic and very astringent, against diarrhea, dysentery, urinary tract inflammation
EUPHORBIACEAE			
<i>Euphorbia helioscopia</i> L. subsp. <i>eu-helioscopia</i>	TH	AS-EUR	Purgative, vesicant
<i>Anthyllis vulneraria</i> subsp. <i>maura</i> (Beck) Maire	TH	EUR-MED	Astringent, vulnerable, depurative and slightly laxative. Against the intestinal and stomach laziness and vomiting of children
<i>Astragalus ramosus</i> L.	TH	MED	Emollient, softening, galactagogue
<i>Calicotome spinosa</i> (L.) Link subsp. <i>spinosa</i>	CH	W. MED	Various episodes of intoxication and as hypoglycemic.
<i>Coronilla scorpioides</i> (L.) W.D.J. Koch	TH	MED	Leaves: purgative; Seeds: asthma, heart conditions, purgative, scorpion sting.
<i>Lotus ornithopodioides</i> L.	TH	MED	Astringent, vulnerary
<i>Scorpiurus muricatus</i> subsp. <i>sulcatus</i> (L.) Theil.	TH	MED	Scorpion sting
FAGACEAE			
<i>Quercus coccifera</i> L. subsp. <i>coccifera</i>	PH	W. MED	Treatment of dysentery
<i>Quercus ilex</i> subsp. <i>ballota</i> (Desf.) Samp	PH	MED	Urinary disorders of children
<i>Quercus suber</i> L.	PH	W-MED	Used as a haemostatic and healing in wound care. Antidiarrheal and in the treatment of diseases of the stomach and colon
GENTIANACEAE			
<i>Blackstonia perfoliata</i> subsp. <i>grandiflora</i> (Viv.) Maire	TH	MED	Febrifuge, stomachic, tonic
<i>Centaurium erythraea</i> subsp. <i>suffruticosum</i> (Salzm. ex Griseb.) Greuter	TH	EUR-MED	Against dysentery, flatulence, hemorrhoids, mucous fevers. Also to increase the pressure
GERANIACEAE			
<i>Geranium purpureum</i> Vill.	TH	COSM	Gastric pain and gallbladder disease
LAMIACEAE			
<i>Lavandula stoechas</i> L.	CH	MED	Stomach and pectorals pains, also known as diuretic
<i>Marrubium vulgare</i> L.	HE	COSM	Liver diseases, allergies, and gallbladder care, fights pelvic pain and coughing
<i>Origanum vulgare</i> subsp. <i>glandulosum</i> (Desf.) Ietsw	HE	END ALG-TUN	Used as a herbal tea to cure several diseases such as: rheumatism, cough, colds and digestive disorders
<i>Rosmarinus officinalis</i> L.	CH	MED	Stimulants, antispasmodic, diuretic, cholagogue and vermifuge. Calm stomach colic and flu
<i>Salvia verbenaca</i> (L.) Briq.	HE	ATL-MED	Stimulant, tonic, antiseptic
<i>Teucrium pseudochamaepitys</i> L.	TH	W-MED	Used as a tea to treat digestive disorders, spasms and colic
<i>Teucrium thymoides</i> Pomel.	CH	EUR-MED	Vomiting and pinworms
<i>Thymus ciliatus</i> (Desf.) Benth. subsp. <i>ciliatus</i>	CH	END. N.A	Depurative, influenza, cough, cold, abdominal meteorism and diseases of the endocrine glands
MALVACEAE			
<i>Malva sylvestris</i> L.	TH	AS-EUR	Headache, drowsiness, urine retention and kidney disease

TAXA	BIO-LOGY	CHORO-TYPE	THERAPEUTIC USE
OLEACEAE			
<i>Olea europaea</i> L. subsp. <i>europaea</i>	PH	MED	Gum disease and high blood pressure. Against the flu, cardiovascular problems and heals the skin. Diuretic, antidiabetic
<i>Phillyrea angustifolia</i> L.	PH	MED	Treatment of fever
ORCHIDACEAE			
<i>Ophrys fusca</i> Link.	GE	MED	Tubers are used to treat the problems of sexual disability of men
<i>Ophrys lutea</i> (Cav.) Gouan	GE	MED	
<i>Ophrys speculum</i> Link	GE	MED	
<i>Ophrys tenthredinifera</i> Willd. p.p.	GE	MED	
<i>Orchis olbiensis</i> Reut. ex Gren	GE	AS-EUR	
<i>Orchis papilionacea</i> L.= <i>Anacamptis papilionacea</i> (L.) R.M. Bateman, Pridgeon & M.W. Chase	GE	MED	
PAPAVERACEAE			
<i>Fumaria officinalis</i> L.	TH	EUR	Diuretic and cholagogue, debility of digestive tract, abdominal congestions, jaundice, scars and cutaneous affections
<i>Papaver rhoeas</i> L	TH	COSM	Antispasmodic, sedative, recommended for insomniacs and against eye inflammation
PINACEAE			
<i>Pinus halepensis</i> Mill.	PH	MED	Expectorant, balsamic, mild diuretic, antiseptic, astringent
<i>Pinus pinea</i> L.	PH	MED	Respiratory diseases, urinary disorders, stomach ulcers and weakness. In external use balsamic, antiseptic and antirheumatic
PLANTAGINACEAE			
<i>Globularia alypum</i> subsp <i>alypum</i>	CH	MED	Antiparasitic, stomachic, cure for diabetes and colon
<i>Plantago afra</i> L.	TH	MED	Constipation, diarrhea, inflammatory bowel disease, reduces cholesterol and blood glucose levels, prevent coronary heart disease
<i>Plantago albicans</i> L.	HE	MED	Against diarrhea, poultices in the care of wounds
<i>Plantago bellardii</i> All	TH	AS-EUR	Laryngitis, diarrhea
<i>Plantago coronopus</i> L. subsp. <i>coronopus</i>	HE	MED	Softening, astringent, emollient
POACEAE			
<i>Ampelodesmos mauritanicus</i> (Poir.) Durand & Schinz	CH	W-MED	Kidney stones and gallbladder
<i>Avena sterilis</i> L.	TH	COSM	Softening, anti-asthenic, emollient
<i>Macrochloa tenacissima</i> (L.) Kunth = <i>Stipa tenacissima</i> L.	GE	MED	Pressure problems
POLYGONACEAE			
<i>Rumex bucephalophorus</i> L.	TH	EUR	Disorders due to a high level of toxins in the body, against constipation
PRIMULACEAE			
<i>Lysimachia arvensis</i> (L.) U. Manns & Anderb. = <i>Anagallis arvensis</i> L.	TH	COSM.	Diuretic, depurative, expectorant and hepatic

TAXA	BIO-LOGY	CHORO-TYPE	THERAPEUTIC USE
RANUNCULACEAE			
<i>Clematis flammula</i> L	PH	MED	Analgesic, rubefiant, vesicant
RESEDAEAE			
<i>Reseda alba</i> L. subsp. <i>alba</i>	TH	EUR-AS	Diarrhea, colic and digestive intoxications
<i>Reseda collina</i> Müll. Arg.	HE	MED.	Sudorific
<i>Reseda luteola</i> L.	TH	EUR-AS	Sudorific
RHAMNACEAE			
<i>Rhamnus lycioides</i> subsp. <i>oleoides</i> L.	PH	W-MED	Hepatitis and jaundice
<i>Ziziphus lotus</i> (L.) Desf.	PH	MED	For all diseases, especially lung diseases
ROSACEAE			
<i>Crataegus monogyna</i> Jacq	PH	EUR-MED	Anxiety, insomnia, dizziness, hypertension, cardiac and nervous disorders also to calm colic and diarrhea. In external use it is useful in the case of sore throat
SANTALACEAE			
<i>Osyris alba</i> L.	CH	MED.	Aphrodisiac, alopecia
SMILACACEAE			
<i>Smilax aspera</i> L.	PH	MED	Rheumatism, asthma, skin diseases, kidney and urinary infections
TAMARICACEAE			
<i>Tamarix gallica</i> L	PH	N. TROP	Liver and diabetes
THYMELAEACEAE			
<i>Thymelaea hirsuta</i> Endl.	CH	MED	Softening for the hair. Treats cough and constipation
XANTHORRHOEACEAE			
<i>Asphodelus microcarpus</i> Salzm. et Viv.	GE	MACAR-MED	Otitis, rheumatism and dental pain

Table 2. List of medicinal plants from the study area: Tiaret Mountains (western Algeria).

## ACKNOWLEDGEMENTS

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