ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

The Therophytes Aromatic and Medicinal Plants of the Southern Slopes of the Mountains of Tlemcen (Western Algeria) Between Utility and Degradation

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ABSTRACT

This study is devoted to the identification of therophyte species that grow on the southern slopes of the mountains of Tlemcen (western Algeria) and their uses in traditional medicine by the people of the region.
The floristic inventories were performed according to method of Braun-Blanquet. The analysis of different surveys made on the ground has allowed us to extricate the major taxa in the study area. 74 therophyte species were identified of which 35 plants are considered medicinal and aromatic. The species most used by people to cure various diseases are: *Centaurium umbellatum, Fumaria capreolata, Malva sylvestris, Sinapis arvensis*, *Calendula arvensis, Capsella bursa- pastoris, Anagallis arvensis, Coronilla scorpioides, Sinapis alba, Sideritis montana, Euphorbia helioscopia, Plantago psyllium, Convolvulus arvensis*, *Lavatera trimestris* and *Calendula arvensis.*
These species have a role in socio-economic and ecological of the region. Many plants have biological properties very interesting that find applications in various fields (medicine, pharmacy, cosmetics and food).
Nevertheless, the anthropogenic impact sustained and continuous which they are subject endangers the future of this rich heritage.

Keywords: Therophytes, Aromatic and medicinal plants, Utility, Degradation, Tlemcen.

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ISSN: 0975-8585

INTRODUCTION

Vegetation plays a fundamental role in the structure and functioning of ecosystems which it constitutes an expression for the biological potential. The replacement of plant communities by others in the same space takes place the course of time.

This substitution is virtually continuous and results from the variation of the dominant plants in response to changes in environmental conditions [1, 2].

The plant population of a region can be envisaged under two different points of view: either under the angle of its floristic groups, either under that of the structure, of the physiognomy and of the dynamism of these latter [3].

The vegetation has always a role of great importance to the health of men and humanity and ecologically. A large number of plant species used by humans are aromatic and medicinal plants. These plants contain one or more active ingredients capable of preventing, alleviating or curing diseases [4].

Approximately 70% of wild plants of North Africa have a potential value in terms of medicine, biotechnology and optimization of crop. The number of genera and species present in Algeria and Tunisia is around 980 genera and 3300 species. Of these, the Saharan flora is approximately 400 genera and 1100 species, more than a third is in Algeria , although the inventory of the flora is not yet exhaustive, and work evaluations is still fragmentary [5].

In Algeria, more precisely in the region of Tlemcen, the natural plant resources, like other Mediterranean areas, have known for decades a continual decline, due to the combined action of man and climate. The degradation of the floristic richness leads to transformation of plant structures (forest and Scrub) in grassland based on therophytes species.

Our work focuses on identifying therophytes of the southern slopes of the mountains of Tlemcen, their uses in traditional medicine by local people and human impact which they are exposed. Little work has been done to date on this part of the region of Tlemcen.

MATERIALS AND METHODS

The area study is located in the western part of North-western Algeria. To meet our goal, 150 of level phytoecological were performed on five stations in the study area (Fig1). Surveys were carried out according to the method of Braun-Blanquet [6]. This approach allowed us to identify the therophytic species that thrive in this natural space.

ISSN: 0975-8585

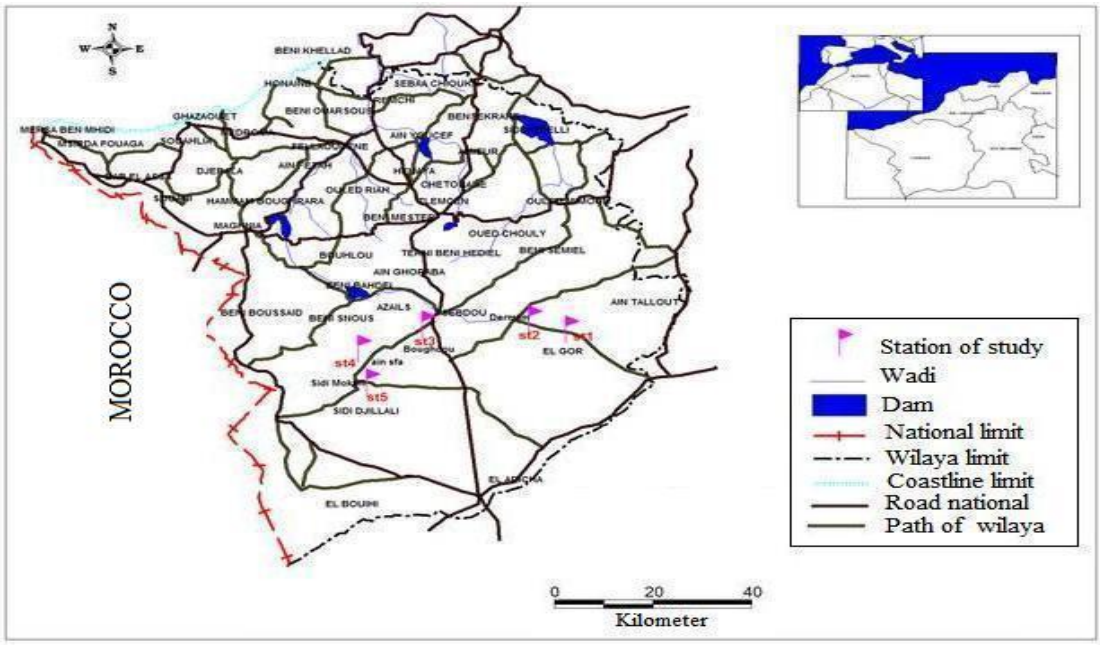

Figure 1: Location of study sites

The species encountered were identified using floras: flora of Quézel and Santa [7], Ozenda [8], Flora of France of Gaston Bonnier [9], report synthesis of Abdelguerfi [10], catalog of plants of El Rhaffari [11] and catalogs of medicinal and aromatic plants [12-14].

An ethnobotanical survey was conducted in the study area to identify the different uses of traditional plants by the local population. This survey is based on a questionnaire which contains the name of the local plant, its usefulness in traditional medicine, the parts used, methods of preparation and dosage.

RESULTS AND DISCUSSION

The analysis of different floristic surveys (150 in total) allowed us to identify 149 species in the study area divided into biological function types as follows (Fig. 2):

-Therophytes: 50%
- Hemicryptophytes: 24.83%
- Chamaephytes: 13.43%
- Geophytes: 7.38%
- Phanerophytes: 4.7%

ISSN: 0975-8585

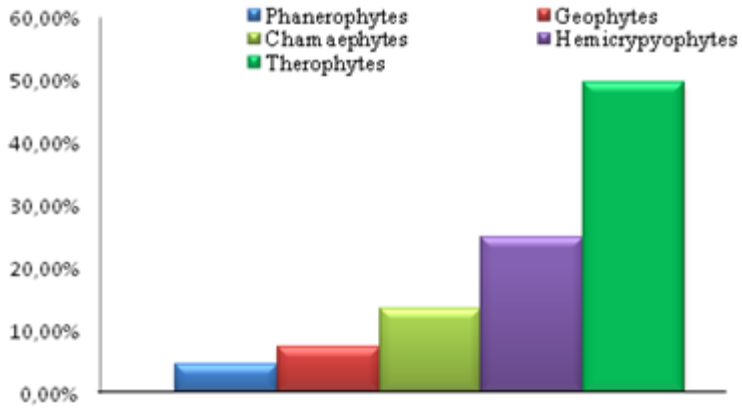

Figure 2. Percentage of biological types of study area

Statistically the therophytes are best represented followed of the hemicryptophytes and chamaephytes. The Geophytes and the phanerophytes are numerically less important.

The high percentage of therophytes is mainly due to the effects of disturbances that knows the area (climate change and anthropogenic impact).

According to the results of the investigation on the ground the largest numbers of species identified are useful socio-traditionally. Of the 149 species recorded 92 species of medicinal and aromatic plants (MAP) (62%) are distributed as follows (Fig. 3):

- 6 species are phanerophytes,
- 13 species are chamaephytes,
- 30 species are hemicryptophytes,
- 8 species are geophytes,
- 35 species are therophytes.

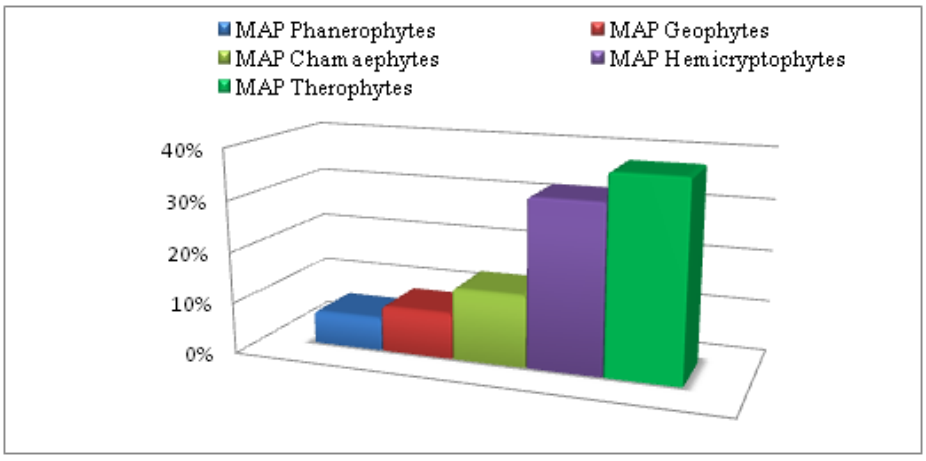

Figure 3.Percentage of MAP according to their biological types

ISSN: 0975-8585

According to the sheets counting surveys 26 species have attracted attention and are most commonly used in the treatment of internal body, against only 3 species for the treatment of external diseases (Table 1). In our analysis of records of investigations we found that six species have a dual purpose (internal and external).

Table 1.Distribution of species according to their uses (internal and external)

Internal use	External use	Internal and external use
Teucrium pseudo-chamaepitys L.	*Scorpiurus muricatus* L.	*Coronilla scorpioides* Koch
Sideritis Montana L.	*Lotus ornithopoioides* L.	*Malva sylvestris* L.
Avena sativa L.	*Chrysanthemum segetum* L.	*Reseda lutea* L.
Aegilops triuncialis L.		*Anagalis arvensis* L.
Vicia sativa ssp amphicarpa (L.) Batt		*Centaurium umbellatum* (Gibb.) Beck.
Euphorbia peplis L.		*Calendula arvensis* L.
Euphorbia helioscopia L.		
Lithospermum tenuiflorum L.		
Plantago ovata Forsk		
Plantago psyllium L.		
Plantago lagopus L.		
Convolvulus arvensis L.		
Lavatera trimestris L.		
Reseda phyteuma L.		
Reseda alba L.		
Sinapis arvensis L.		
Sinapis alba L.		
Capsella bursa- pastoris L.		
Papaver rhoeas L.		
Adonis aestivalis L.		
Valerianella coronata ssp discoidea L.		
Fumaria capreolata L.		
Chrysanthemum coronarium L.		
Senecio vulgaris L.		
Centaurea solstitialis L.		
Reichardia picroides subsp intermedia (Sch. Bip) Q. & S.		

Overall, and based on the results we can see that with the digestive tract can be treated with 12 species which : *Coronilla scorpioides, Vicia sativa, Sinapi sarvensis, Plantago psyllium* and 9 species are traditionally used as emollient and are purgative, it is: *Avena sativa, Euphorbia peplis, Malva sylvestris, Reseda lutea, Lavatera trimestris*. Other species can adjust the following malfunctions:

8 species are traditionally used to treat renal dysfunction and are diuretic as: *Lithospermum tenuiflorum, Anagallis arvensis, Capsella bursa- pastoris, and Adonis aestivalis*.

6 species are traditionally used as disinfectant and vulnerary, this is the case: *Lotus ornithopodioides, Malva sylvestris, Reseda lutea, Anagallis arvensis, Chrysanthemum segetum* and *Calendula arvensis.*

5 species of plants traditionally used to treat influenza (calm cough, sore throat, bronchitis, laryngitis and rhinitis) in the case of: *Malva sylvestris, Sinapis alba, Papaver rhoeas, Anagallis arvensis* and *Calendula arvensis.*

4 species are used to cure liver as: *Convolvulus arvensis, Anagallis arvensis, Centaurium umbellatum* and *Calendula arvensis.*

4 species are antipyretic it is the case of: *Sideritis montana, Centaurium umbellatum, Fumaria capreolata* and *Centaurea solstitialis.*

4 species are used to fight against tranpiration: *Reseda phyteuma, Reseda lutea, Capsella bursa-pastoris* and *Calendula arvensis.*

4 species are used as a tonic it is the case of: *Sideritis montana, Capsella bursa- pastoris, Centaurium umbellatum and Fumaria capreolata.*

3 species are used to treat heart conditions: *Coronilla scorpioides, Adonis aestivalis* and *Fumaria capreolata.*

3 species are used to treat hemostatic action and are Antihemorrhagics: *Capsella bursa-pastoris, Calendula arvensis* and *Senecio vulgaris.*

2 species are used as anti-hysterical: *Sideritis montana* and *Fumaria capreolata.*

2 species are used for Dropsy: *Euphorbia peplis* and *Anagallis arvensis*

2 species are traditionally used as refreshing**:** *Avena sativa* and *Valerianella coronata subsp discoidea.*

2 species are used to treat the sting of the scorpion: *Scorpiurus muricatus* and *Coronilla scorpioides.*

2 species are used for the antiscorbutic: *Capsella bursa- pastoris* and *Fumaria capreolata.*

2 species are traditionally used for gout: *Centaurium umbellatum and Aegilops triuncialis.*

In addition a number of species are used to treat diseases of asthma, rheumatism, anemia, hair loss, hypotensive, immunostimulant.

ISSN: 0975-8585

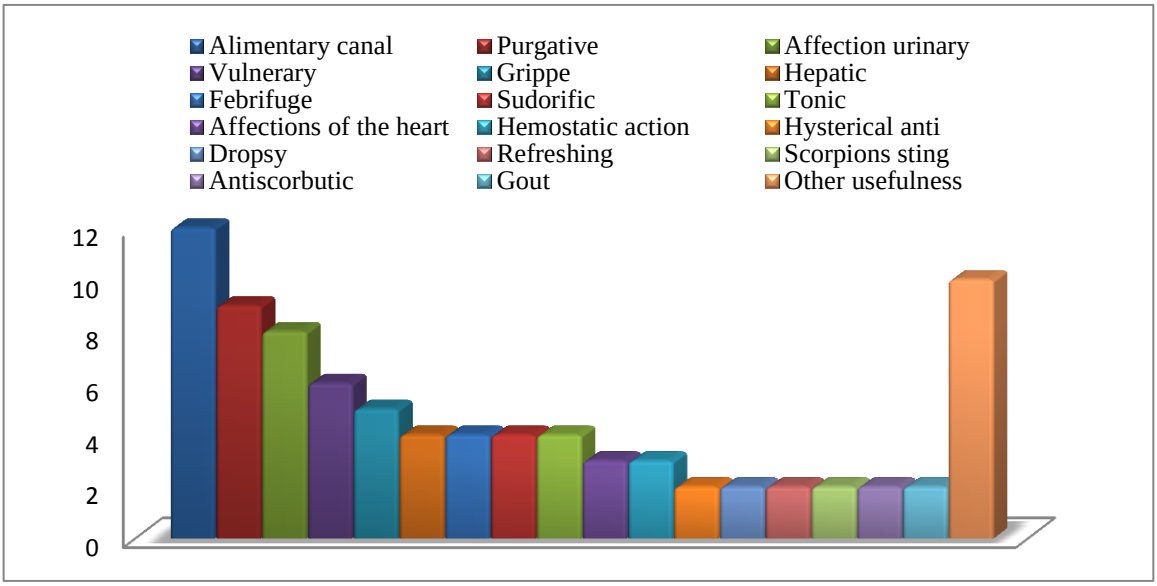

Figure 4. Distribution of plants according to their traditional uses

We find that many plant species have a beneficial effect in the treatment of diseases with the digestive tract. Table 2 summarizes the medicinal plants found in the region and their utility in the treatment of disease.

Concerning the plants sampling and the used parts we found that all the responses indicate that the plants are used before seed formation and are generally uprooted. This way the plants no allow not completing their life cycles and causing the erosion of plant genetic resources in the region. We are currently witnessing a regression of aromatic and medicinal species of the southern slopes of the mountains of Tlemcen. The rural community of the southern slopes of the mountains of Tlemcen used almost exclusively medicinal plants to treat diseases because modern medicine is very expensive.

Table 2: Lists of medicinal and aromatic therophytes the study area and their uses

Species	Family	Utility
Coronilla scorpioides Koch.	Fabaceae	Leaves: purgative; Seeds: asthma, heart conditions, purgative, scorpion sting.
Vicia sativa ssp. Amphicarpa (L.) Batt.	Fabaceae	Seed flour: cataplasms.
Lotus ornithopodioides L.	Fabaceae	astringent, vulnerary.
Scorpiurus muricatus L.	Fabaceae	scorpion sting.
Teucrium pseudochamaepitys L.	Lamiaceae	Leaves: used as a tea to treat digestive disorders, spasms and colic
Sideritis montana L.	Lamiaceae	Whole plant: febrifuge, tonic, stimulant, anti-hysterical.
Avena sativa L.	Poaceae	Oatmeal-Oatmeal is used in medicine as an emollient, refreshing and slightly nutritious.
Aegilops triuncialis L.	Poaceae	Gout

Euphorbia peplis L.	Euphorbiaceae	Plant: gout, dropsy, diseases of the chest; Root: purgative.
Euphorbia helioscopia L.	Euphorbiaceae	Violent purgative, be employed especially to remove warts.
Lithospermum tenuiflorum L.	Borraginaceae	Has a favorable effect on renal function, decreased uremia, increased glomerular filtration rate, excretion of urea and creatinine.
Plantago ovata Forsk.	Plantaginaceae	Treats diarrhea, hemorrhoids and hypertension.
Plantago psyllium L.	Plantaginaceae	Treats constipation, diarrhea, inflammatory bowel disease, reduces cholesterol levels and blood glucose levels and prevent coronary heart disease.
Plantago lagopus L.	Plantaginaceae	Diarrhea, constipation.
Convolvulus arvensis L.	Convolvulaceae	Hepatic dropsy. In terms of toxicity are known for their hallucinogenic alkaloids they contain.
Malva sylvestris L.	Malvaceae	It is used to alleviate cough, sore throat, mouth ulcers, bronchitis, laryngitis and hoarseness.
Lavatera trimestris L.	Malvaceae	Laxative.
Reseda phyteuma L.	Resedaceae	Sudorific.
Reseda alba L.	Resedaceae	Sudorific.
Reseda lutea L.	Resedaceae	Sudorific.
Sinapis arvensis L.	Brassicaceae	Increases the secretion of the intestinal mucosa.
Sinapis alba L.	Brassicaceae	Pulmonary congestion, bronchitis, pleurisy, neuralgia, rheumatic pain.
Capsella bursa- pastoris L.	Brassicaceae	Tonic, diaphoretic, diuretic.
Papaver rhoeas L.	Papaveraceae	Sedative, calms cough.
Adonis aestivalis L.	Renonculaceae	Cardiotonic, diuretic.
Valerianella coronata subsp discoidea L.	Valérianaceae	Refreshing, lenitive and pectoral.
Anagallis arvensis L.	Primulaceae	**Internal Use**: bronchitis, liver disorders, jaundice, hemorrhoids, nephritis, urolithiasis, epilepsy, dropsy, expectorant, diuretic, cholagogue, laxative, analgesic, stimulant. External use: wounds fungus, torpid, bedsores, pruritus.
Centaurium umbellatum (Gibb.) Beck.	Gentianaceae	**Internal use**: in appetence, weakness, anemia, convalescence; laziness digestive, hepatic congestion, painful dyspepsia (flatulence), febrile, gout, eczema dermatitis, intestinal parasites. **External use**: wounds, hair loss.
Fumaria capreolata L.	Fumariaceae	Regulates bile flow. Stimulates the liver and spleen, regulates the formation of bile; worming.
Chrysanthemum segetum L.	Asteraceae	Flowers insecticide.
Chrysanthemum coronarium L.	Asteraceae	Hypotensive.

Senecio vulgaris L.	Asteraceae	Antihemorrhagics and antispasmodic
Centaurea solstitialis L.	Asteraceae	Flowers febrifuge; Root: stomachic.
Reichardia picroides subsp intermedia (Sch. Bip) Q et S.	Asteraceae	A little diuretic.
Calendula arvensis L.	Asteraceae	**External use:** anti-inflammatory, antiseptic, disinfectant, **Internal use**: sudorific, diuretic and immunostimulant.

CONCLUSION

Analysis of the results obtained in this study allowed us to identify species therophyte of the southern slopes of the mountains of Tlemcen. 35 plant species are used in traditional medicine and have some socio-economic interest mainly in the treatment of diseases of the digestive and urinary disorders. Among the species most sought after: *Centaurium umbellatum*, *Fumaria capreolata, Malva sylvestris, Calendula arvensis, Capsella bursa- pastoris, Anagallis arvensis, Coronilla scorpioides, Sinapis alba.*

However, under the influence of climatic disturbances, socio-economic (sampling before the end of cycle) and anthropogenic (overgrazing) many aromatic and medicinal plants spontaneous study area are becoming increasingly rare that leads erosion of plant genetic wealth.

Despite the existence of a state program for the conservation of plant genetic resources, its implementation remains weak and we are currently witnessing a decline in the floristic heritage

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