

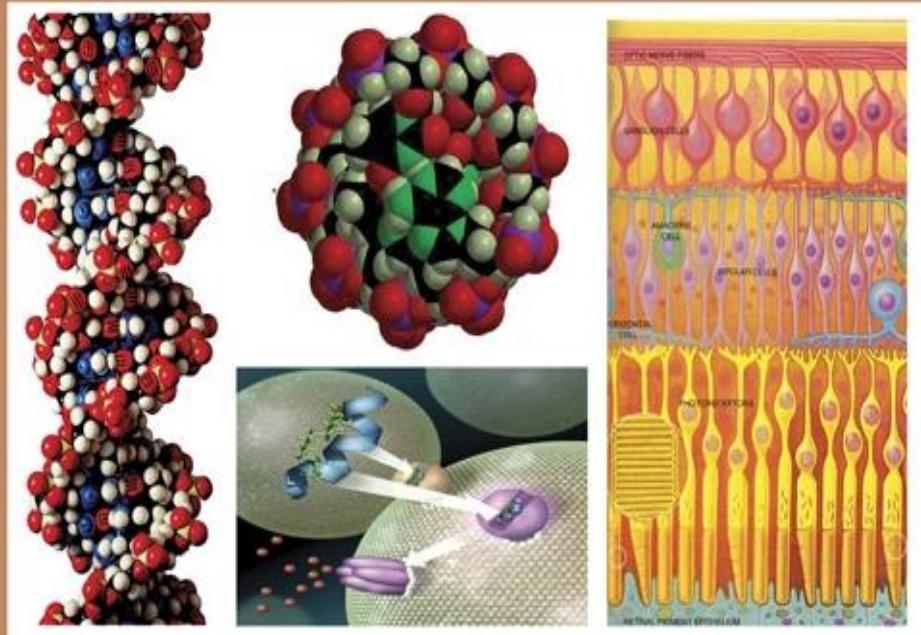


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Sensitive Medicinal Plants in El Bayadh Zone (Algeria, W)

Djelaila yassine², Dif Mustapha Mahmoud^{1,2}, Benchohra-Hadria Amel³, Dagbouch Houda², Ahmadi Asma², Blidi Salima², Badji Abderezak² and Sofiane Miloua²

1. Ecodeveloppement des espaces laboratory, Djilali Liabes university. Sidi Bel Abbes. 22000
2. Science institute. Nour Bachir center university. El Bayadh. 32000
3. Nature and life faculty. Djilali Liabes university. Sidi Bel Abbes. 22000

*E. Mail: mustitus17@hotmail.com

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ABSTRACT

The steppe areas of El Bayadh are characterized by a great diversity of medicinal plants (South-West Algeria). This work aims to determine the traditional uses of medicinal plants in the Wilaya (Province) of El Bayadh and evaluate their sensibility. The ethnobotanical surveys carried out using 400 questionnaire sheets made it possible to inventory 40 medicinal species belonging to 23 botanical families the most important family is that of the Lamiaceae and the Fabaceae. The leaves are the most used part of the plant, and the majority of treated illnesses are those of the respiratory system (the flu). The result of the index invented to indicate the state of the sensibility of the plants is important to develop a conservation strategy for these medicinal plants in the context of sustainable development.

INTRODUCTION

For a long time, humans have developed extraordinary medicinal virtues, using plants, this knowledge and therapeutic use have been based on analysis and observation which are known under the name of herbal medicine. Around 35,000 plant species are used medicinally worldwide and are making up the broadest range of biodiversity used by humans. At present, plants are still the first reservoir of new drugs, they are considered an essential raw material for the discovery of new molecules.

Medicinal plants constitute a precious heritage and a real treasure for humanity, and are in great demand in the world and more particularly in developing countries. These medicinal plants still remain a source of medical care in poor countries due to the lack of a modern medicinal system (Bakhtaoui H 2017).

The demographic exploitation on a planetary scale has accentuated these new modifications of the species by favoring the appearance of threats; it is only the acceleration of events over the past decades that have made world opinion sensitive to environmental and conservation issues. Today, it is very urgent to collect ethnobotanical information before it is too late, by drawing up as complete an inventory as possible of the plants still used today by rural populations. The preservation of this knowledge is an issue for the conservation and enhancement of natural resources on the one hand and for the preservation of cultural heritage on the other hand (Bouzuane Z 2017).

EL bayadh region is found in the west of Algeria, especially in the semi-arid zone. It is recognized for its Biodiversity in medicinal and aromatic plants, as well as its various popular uses across the country. These are ancestral know-how transmitted from generation to generation among the population (Dif *et al.*, 2022; Alami *et al.*, 2022).

The aim of this work is to determine the traditional uses of medicinal plants in the Wilaya of El Bayadh and evaluate their sensibility with an invented index.

MATERIALS AND METHODS

Study Area:

The wilaya of El Bayadh presents three geographical groups: the high plains of the Alps in the North, the Saharan Atlas and the Saharan platform in the South.

the soils of the wilaya of El Bayadh are moderately deep and not very evolved,

with low organic matter content, generally, they are iso-humic soils.

On the other hand, the mineral soils are located on the summits of the Jebel, the calcimagnesic soils occupy the slopes of the Jebel and the foothills. Allomorphic soils are found in the chott chergui and in the sebkhas (Pouget, 1980). 60% of the total area of the wilaya (Province) is made up of sand dunes forming a natural environment that does not allow the development of either agriculture or livestock (Bouaichi2017).

Precipitation is an important climatic factor in terms of its influence on the distribution of plant species (LakhdarI, 2015). The knowledge of the evolution of this ecological factor in our study area (the wilaya of El bayadh) is necessary to better understand the interactions of vegetation with climatic factors. To evaluate this factor, it was considered useful to take the rainfall data.

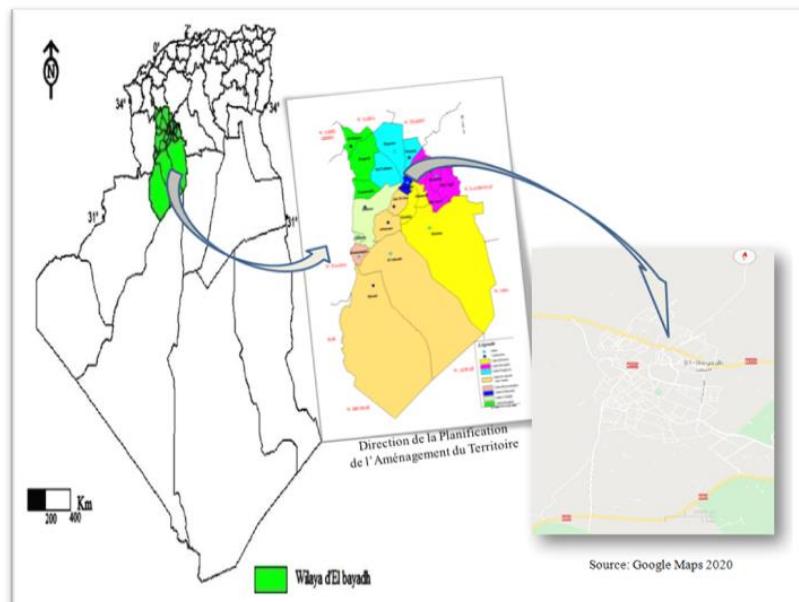


Fig.1: Location map of the study area (El Bayadh wilaya).

Ethnobotany Surveys:

In this modest work, our material consists of an Ethnobotany survey (Liste 1) sheet of individual interviews in the wilaya center of El Bayadh. This work lasted almost two months (April / May 2020) during which

we conducted interviews with most of the herbalists (10) in the cities of the Wilaya of El Bayadh, during each interview, we collected information on the survey and the medicinal plants used by it.

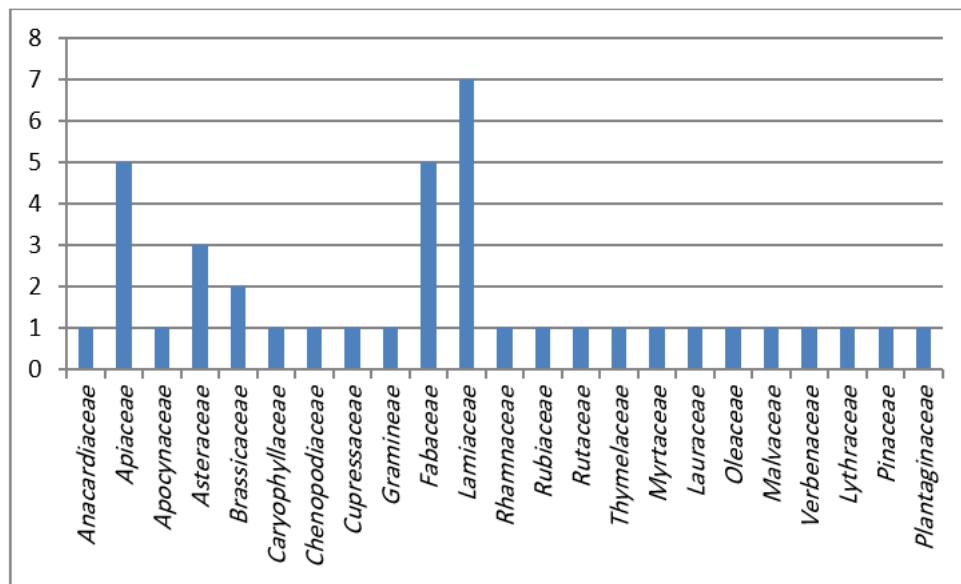


Fig. 2: The profile of each survey of medicinal plants in El Bayadh region.

Sensitive Medicinal Plants:

The flowers, roots, and bark are the most important parts which express the sensitivity of the plant, and the rest of the parts are the leaves, stem, leaves, and stem together fruits and grains.

In the following table, each part has been expressed by the number it represents to know the most sensitive plants:
Flowers (3), Roots (04), bark (03), leaves (01), stem (02), leaf and stem (02), fruits (01), seeds (01).

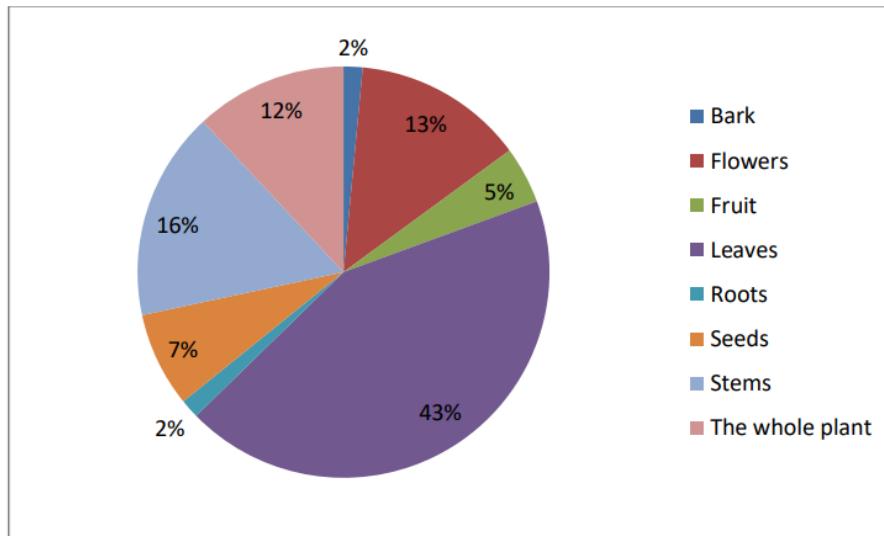


Fig. 3: The frequency of the used part of plants

Analysis of The Catalog of Medicinal Plants:

Using the 40 questionnaire forms established, we identified 40 medicinal

plants used by herbalists in the region of El Bayadh. The table below, the list of plants classified by botanical families, used parts and method of preparation.

Table 1: The profile of each survey of medicinal plant in El Bayadh region

<ul style="list-style-type: none"> The data collected for each plant includes the vernacular name: (common name) Botanical families Uses : <table border="1"> <thead> <tr> <th></th><th>Therapeutic</th><th>Cosmetic</th></tr> </thead> <tbody> <tr> <td>Uses</td><td></td><td></td></tr> </tbody> </table>		Therapeutic	Cosmetic	Uses												
	Therapeutic	Cosmetic														
Uses																
<ul style="list-style-type: none"> The part used:: <table border="1"> <thead> <tr> <th></th><th>Roots</th><th>Stem</th><th>Flower</th><th>Fruit</th><th>Grains</th><th>leaves</th><th>bark</th></tr> </thead> <tbody> <tr> <td>Part used</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		Roots	Stem	Flower	Fruit	Grains	leaves	bark	Part used							
	Roots	Stem	Flower	Fruit	Grains	leaves	bark									
Part used																
Method of preparation : <input type="checkbox"/> Infusion <input type="checkbox"/> Decoction <input type="checkbox"/> Powder <input type="checkbox"/> Fumigation <input type="checkbox"/> Maceration <ul style="list-style-type: none"> Source of plant • Existing quantity • Diseases 																

RESULTS

The use of medicinal plants through therapeutic is observed during interviews with the herbalists from the study area. According to the results of the survey, leaves are the most used parts (43%), the whole plant the second place with respective percentages of (25%), the grain, the flower; the stem occupying an average place with a rate of (9%, 6%, 7%). All of the remaining parts used, namely, fruit, bark, and root are represented by a cumulative rate of (5%, 3%, and 2%).

Decoction and powder are the most frequent methods of preparation (30% and 23% respectively) other modes of use are grouped under the term's infusion (21%), and maceration (21%) Fumigation (5 %).

The results of the survey of plants used by the population tell us that the population uses medicinal plants to treat diseases from the stomach in the first place, flu and respiratory in the second place, diabetes in the third place, cancer, and other diseases as for the origin, most of the medicinal plants come from the state of El Bayadh, which is the region studied, and some other regions, such as the desert and highlands.

As for the quantity available, most herbalists have medicinal plants that grow in the non-threatening spawning area in large quantities compared to other plants (Table 2).

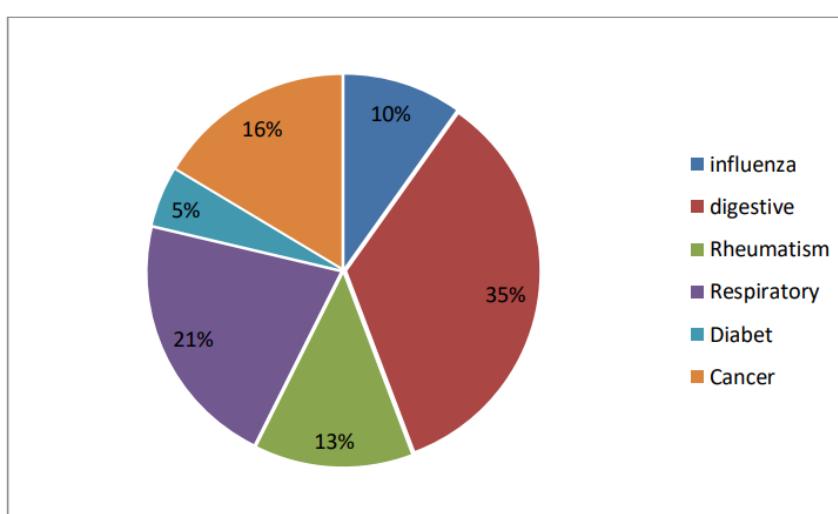


Fig. 4: The frequency of plants remedies

Table 02: The use of medicinal plant remedies of the study

Medicinal Plant	Influenza	Digestive	Rheumatism	Respiratory	Diabet	Cancer
<i>Pistacia lentiscus L.</i>	-	+	+	-	-	+
<i>Bunium bulbocastanum L.</i>	-	-	-	-	-	+
<i>Silybum Marianum</i>	-	-	-	-	-	+
<i>Cuminum Cyminum</i>	-	+	-	-	+	-
<i>Pimpinella anisum</i>	-	+	-	+	-	-
<i>Daucus carota subsp. Sativus</i>	-	+	-	-	-	-
<i>Nerium oleander L.</i>	-	-	-	+	-	+
<i>Artemisia absinthium L.</i>	-	-	+	-	-	-
<i>Artemisia herba-alba</i>	+	+	-	+	-	-
<i>Chamaemelum nobile (L.) All.</i>	-	+	-	-	-	-
<i>Lepidium sativum L.</i>	-	-	+	-	-	-
<i>Pavonia Argentea L.</i>	-	+	-	-	-	-
<i>Parietaria officinalis L.</i>	-	-	-	-	-	-
<i>Artiplex halimus L.</i>	-	-	+	-	-	+
<i>Juniperus phoenicea L.</i>	-	+	-	+	-	-
<i>Stipa tenacissima L.</i>	-	-	-	-	+	-
<i>Cassia angustifolia</i>	-	+	-	-	-	-
<i>Retama raetam (Forssk)</i>	-	-	+	-	-	+
<i>Ceratonia siliqua</i>	-	+	-	-	-	-
<i>Glycyrrhiza glabra</i>	-	+	-	-	-	-
<i>Boswellia sacra</i>	+	-	-	-	-	-
<i>Rosmarinus officinalis</i>	+	+	+	+	-	-
<i>Mentha pulegium L.</i>	+	-	-	+	-	-
<i>Mentha viridis L.</i>	-	-	+	-	-	-
<i>Mentha spicata L.</i>	+	+	-	+	-	-
<i>Thymus vulgaris</i>	+	+	-	-	-	-
<i>Marrubium vulgare</i>	-	-	-	-	-	+
<i>Lavandula angustifolia</i>	-	-	+	+	-	+
<i>Zizyphus lotus</i>	-	-	-	+	-	-
<i>Rubia tinctorum L.</i>	-	-	-	+	-	+
<i>Ruta montana L.</i>	-	-	-	-	-	-
<i>Daphne gnidium L.</i>	-	-	-	-	-	+
<i>Myrtus communis L.</i>	-	+	-	-	-	-
<i>Laurus nobilis L.</i>	-	-	-	-	+	-
<i>Olea europaea L.</i>	-	+	-	+	-	-
<i>Malva silvestris L.</i>	-	+	-	+	-	-
<i>Aloysia Citrodora</i>	-	+	-	+	-	-
<i>Lawsonia inermis</i>	-	+	-	-	-	-
<i>Pinus halepensis</i>	-	+	-	-	-	-
<i>Plantago Medium L.</i>	-	+	-	-	-	-

Table 2: Index of medicinal plant sensibility.

Medicinal Plant	Indexe of sensibity
<i>Pistacia lentiscus L.</i>	1
<i>Bunium bulbocastanum L.</i>	1
<i>Silybummarianum</i>	2
<i>Cuminum Cuminum</i>	4
<i>Pimpinella anisum</i>	1
<i>Daucus carota subsp. Sativus</i>	1
<i>Nerium oleander L.</i>	2
<i>Artemisia absinthium L.</i>	3
<i>Artemisia herba-alba</i>	6
<i>Chamaemelum nobile (L.) All.</i>	5
<i>Lepidium sativum L.</i>	1
<i>Paronychia Argentea L.</i>	3
<i>Parietaria officinalis L.</i>	1
<i>Artiplex halimus L.</i>	3
<i>Juniperus phoenicea L.</i>	6
<i>Stipa tenacissima L.</i>	6
<i>Cassia angustifolia</i>	1
<i>Retama raetam (Forssk.)</i>	2
<i>Ceratonia siliqua</i>	1
<i>Glycyrrhiza glabra</i>	2
<i>Boswellia sacra</i>	2
<i>Rosmarinus officinalis</i>	2
<i>Mentha pulegium L.</i>	5
<i>Mentha viridis L.</i>	5
<i>Mentha spicata L.</i>	3
<i>Thymus vulgaris</i>	2
<i>Marrubium vulgare</i>	3
<i>Lavandula angustifolia</i>	4
<i>Zizyphus lotus</i>	5
<i>Rubia tinctorum L.</i>	2
<i>Ruta montana L.</i>	3
<i>Daphne gnidium L.</i>	1
<i>Myrtus communis L.</i>	5
<i>Laurus nobilis L.</i>	3
<i>Olea europaea L.</i>	3
<i>Malva silvestris L.</i>	1
<i>Aloysia Citrodora</i>	1
<i>Lawsonia inermis</i>	1
<i>Pinus halepensis</i>	3
<i>Plantago Medium L.</i>	1

DISCUSSION

The conducted study has shown that traditional herbal medicine persists and is well requested by the inhabitants of El Bayadh. These results, confirm the results obtained by other authors in other regions such as M'sila (Briki w 2018) and Bouira (Sadallah 2017), which show that medicinal plants remain a source of medical care in the Algerian arid zone. Families and medicinal plants are from different regions; this indicates the expansion of the plant's habitat and its spread. For the most used part of

plants in all regions, the comparison between them is the leaves, which is a large percentage compared to the rest. For plant sensitivity: The organs used in the preparation of medicinal plants vary from one plant to the other which has allowed us to develop an index invented to indicate the state of threat to the plants expressed from the state of survival of the plant after the harvest and the possibility of regeneration offers us the possibility of developing this approach in several regions to compare them with local studies as well as to develop a

conservation strategy for these medicinal plants in a context of sustainable development. Many plants are widely used for their medicinal benefits. On the other hand, this use negatively affects the continuity of their reproduction and this is due to the part that is used, as the roots are the underground organ of a plant, serving to fix them to the ground and absorb the water and nutrients necessary for their development. Also, the flowers, which are the reproductive organs and the bark. The use of these parts frequently prevents their growth and continued reproduction. When these parts of plants are used excessively, the plant becomes more sensitive.

Conclusion

The study of the effect of ethnobotany on medicinal plants leaves two possibilities: their potential health benefits and the risks involved. These studies are used by indigenous and primitive inhabitants, and they are considered to be the study of interactions between Neanderthals and plants. On the other hand, they are considered to be the study of the relationships between humans and plants and their environment. Harvesting is a big problem for medicinal plants, this process puts them at risk by preventing their continued reproduction and growth. We must take advantage of this natural wealth through the sustainable use of its resources. Push and educate the new generation to exploit the field of herbal medicine, which negatively affects the biological diversity and preservation of plant species, and stop the process of excessive harvesting of medicinal plants.

The Medicinal Plant Threat Status Index may open the door to developing Ecological Studies to estimate the threat status of medicinal plants in order to develop conservation plans for this biodiversity.

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