



AMERICAN JOURNAL OF PHARMTECH RESEARCH

Ethnobotanical and Floristic Study of Medicinal Plants Used in the Treatment of Allergic Diseases in the Oran Region, Algeria

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ABSTRACT

In order to gather all the information concerning the nature and the therapeutic uses of the medicinal plants, an ethnobotanical study of the medicinal plants was realized Oran city's circle, between December 2017 and April 2018. This research was conducted in collaboration with different plant users such as ordinary users (500 people) who were randomly selected (340 women, 160 men).

The survey targeted 500 people from the local population, including 423 people preferring medicinal plants with a rate of 84% and 77 people who received treatment in modern medicine with a rate of 16%. The results obtained from the population made it possible to identify 58 medicinal plants which are divided into 34 families, of which three are the most dominant, in particular Lamiaceae (29.55%), Apiaceae (17.96%) and Verbenaceae (14.65%). all listed plants with properties against allergy. the leaves are the most used organs (34%) and the majority of the remedies is prepared as an infusion (58%), the respiratory diseases occupy the first place with a rate of 42%. The results obtained constitute a very valuable source of information for the region studied and for the national medicinal flora. They could be a database for further research in the fields of photochemistry and pharmacology and for the purpose of searching for new natural substances.

Keywords: ethnobotany, medicinal plants, allergy, Oran, questionnaire, phyto therapy

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Received 01 January 2018, Accepted 25 January 2019

Please cite this article as: Bouredja N et al *et al.*, Ethnobotanical and Floristic Study of Medicinal Plants Used in the Treatment of Allergic Diseases in the Oran Region, Algeria. American Journal of PharmTech Research 2019.

INTRODUCTION

For centuries and even millennia, our ancestors used plants to relieve their pain, heal their ailments and heal their wounds. From generation to generation, they have passed on their simple knowledge and experience, striving when they could write it down. Thus, even today, despite the progress of pharmacology, the therapeutic use of medicinal plants is very present in some countries of the world and especially in developing countries, in the absence of a modern medical system ¹

According to World Health Organization, in some developing countries in Asia, Africa and Latin America, 80% of the population depends on traditional medicine.

Traditional medicine certainly constitutes an integral part of the culture of the Algerian population. In Algeria, traditional medicine has been used for a long time thanks to the richness and diversity of its flora, which constitutes a true phytogenetic reservoir, with about 3000 species belonging to several botanical families.

Allergy is defined as an abnormal and specific reaction of the body, in contact with a foreign substance (allergen) that does not cause disorders in most subjects.²

From the type of allergen, there are several types of allergy. The classification of allergies is based on the elective involvement of this or that target organ: respiratory, cutaneous or digestive particular. Allergy is manifested in our organs and devices in contact with an increasingly complex environment, if only by the multiplicity of new molecules of industrial origin, or even drugs, appearing as new potential pollutants. The skin, the respiratory system and the digestive tract become territories of confrontation and the specialists of the corresponding medical disciplines are more and more mobilized in the process of search for guilty allergens then in the attempt to prescribe appropriate therapeutics.

The incidence of allergic diseases has increased in most of the industrialized countries. Chronic exposure to the particles of atmospheric pollution, produced largely by car traffic, is one Offensive factor in increasing the prevalence of respiratory allergic diseases ³⁻⁴

MATERIALS AND METHOD

Type of study

This is a descriptive statistical study

Period of the study

The study spanned a five-month period, from December to April 2018 in the region of Oran.

The map illustrates the geographical context of the Oran region, including the Mediterranean Sea to the north, the Sabkha d'Oran (salt marshes) to the south, and the Ain temouchent and Sidi belabbes areas. It also shows the Mascara region to the east. A scale bar indicates a distance of 40 km.

The climate in Oran tends to be temperate, the city is known for its long hot and humid summers, the rains become rare or nonexistent, and the sky is bright and clear. The subtropical anticyclone covers the Oran region for nearly four months with an average temperature of 25 °. In the winter, the rains can be abundant see torrential. The appearance of snow is very rare but not impossible. Winter in Oran concentrates $\frac{3}{4}$ precipitations.

The rapid and dispersed urbanization experienced by the city of Oran during the last decade has brought to light several problems, including increased traffic density and rising levels of pollution, particularly air pollution. These issues are directly related to the quality of life and may compromise its socio-economic development. Because of the impacts of air pollution on health, fauna, flora, built heritage and climate, it inevitably results in an obstacle to sustainable development in its three main aspects (social, economic and environmental).

The survey was conducted using two questionnaire cards:

- The first questionnaire sent to the public
- The 2nd questionnaire addressed to the herbalists

Both questionnaires are composed of specific questions about the informant (age, sex ...) and the medicinal plants used by him (names, types of diseases treated, parts used, methods of preparation ...).

The survey surveyed 500 people of different ages, gender and cultural backgrounds to focus mainly on the evaluation of the state of use of medicinal plants by the Oran population on the therapeutic applications of the medicinal plants used for allergic diseases.

RESULTS AND DISCUSSION

Frequency of use of plants by the population studied

Of the 500 respondents, 84% (423) used traditional medicine and 16% (77) used modern medicine. The use of medicinal plants was very widespread with a frequency of use of 84%; this indicates that the study population has had extensive use of herbal medicine (Figure 2A). This result is in line with that of World Health Organization, which reports that 80% of the African population depends on traditional medicine.⁵

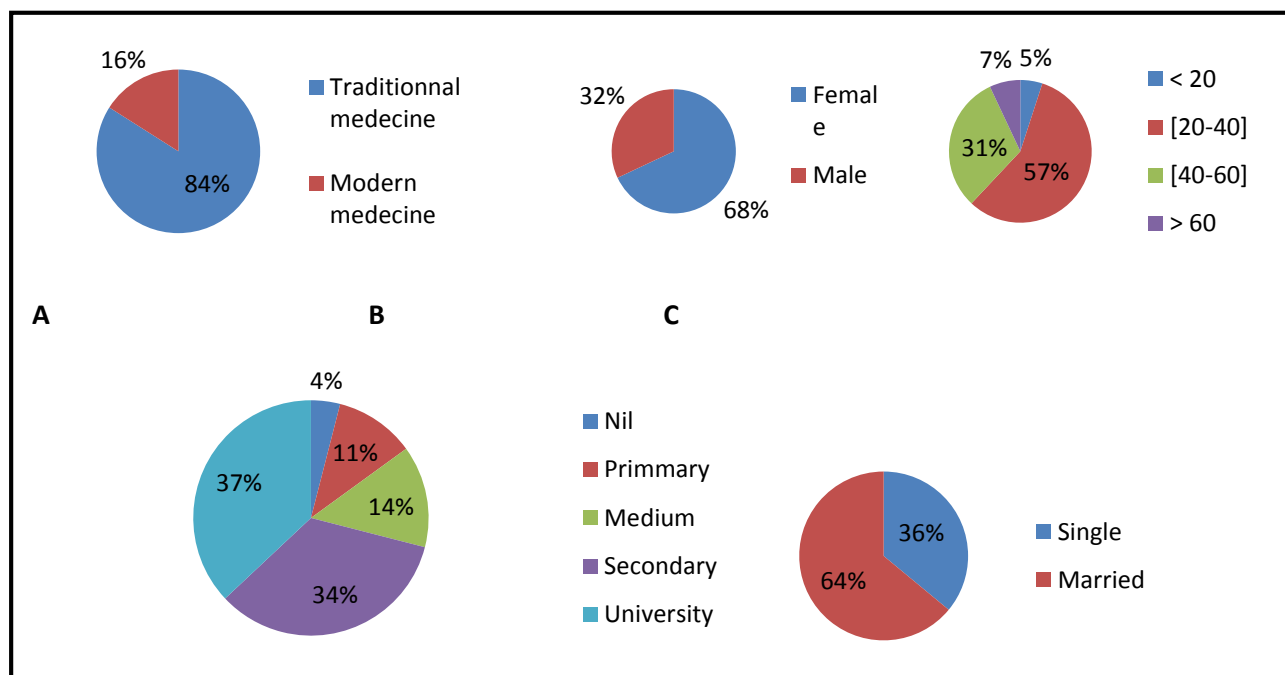


Figure 2: Informant profile results (A- users of traditional medicine and modern medicine, B-Gender, C-Age, D-Education, E-Marital status)

Use of medicinal plants according to the profile of the respondents

Depending on the genre

It is the women who make the most use of plants, with a percentage of 68%. This can be explained by the use of medicinal plants by women in other areas and by their responsibilities as mothers, since they give first aid for their children (Figure 2B).

Depending on the age

The highest percentage was observed among persons belonging to the age group [20 years-40 years] by a rate of 57%, then come the age group of [40 years-60 years] with a rate of 31% and people under the age of 20 and over 60 represent the usage frequencies of 5% and 7%, respectively(Figure 2C).

This notable difference is that older people have more knowledge of medicinal plants than other age groups. Experience accumulated with age is the main source of information on the use of plants in traditional medicine.

Depending on the level of study

The survey showed that people who use medicinal plants have a university level by a percentage of 37%, followed by the secondary level by a percentage of 34%, come the average level, primary, illiterate with a percentage respectively (14%, 11%, 4%) (Figure 2D)

Depending on family situation

The highest percentage was observed among the newlyweds by a rate of 64%, followed by singles by a rate of 36%. This can be explained by the fact that they are responsible as parents for giving first aid in especially for their children (Figure 2E)

The use of medicinal plants according to the parts used

The people questioned use various plant organs (leaves, barks, rhizomes, flowers, fruits, stems, roots) and sometimes even the whole plant.

The results show that the leaves are the most used with a rate of 34%, followed by seeds and fruits by a rate of (16% -11%), stems, flowers, rhizomes, barks with a rate of (9% - 8% -5%), the aerial part and the whole plant by a rate of (6% -4%), and finally the roots and bulbs at a rate of 1%.

The leaves are the most used parts by the population (Figure 3, A).The high frequency of leaf utilization can be explained by the ease and speed of harvesting ⁶ but also by the fact that it is the site of photosynthesis and sometimes the storage of secondary metabolites responsible for biological property of the plant.⁷

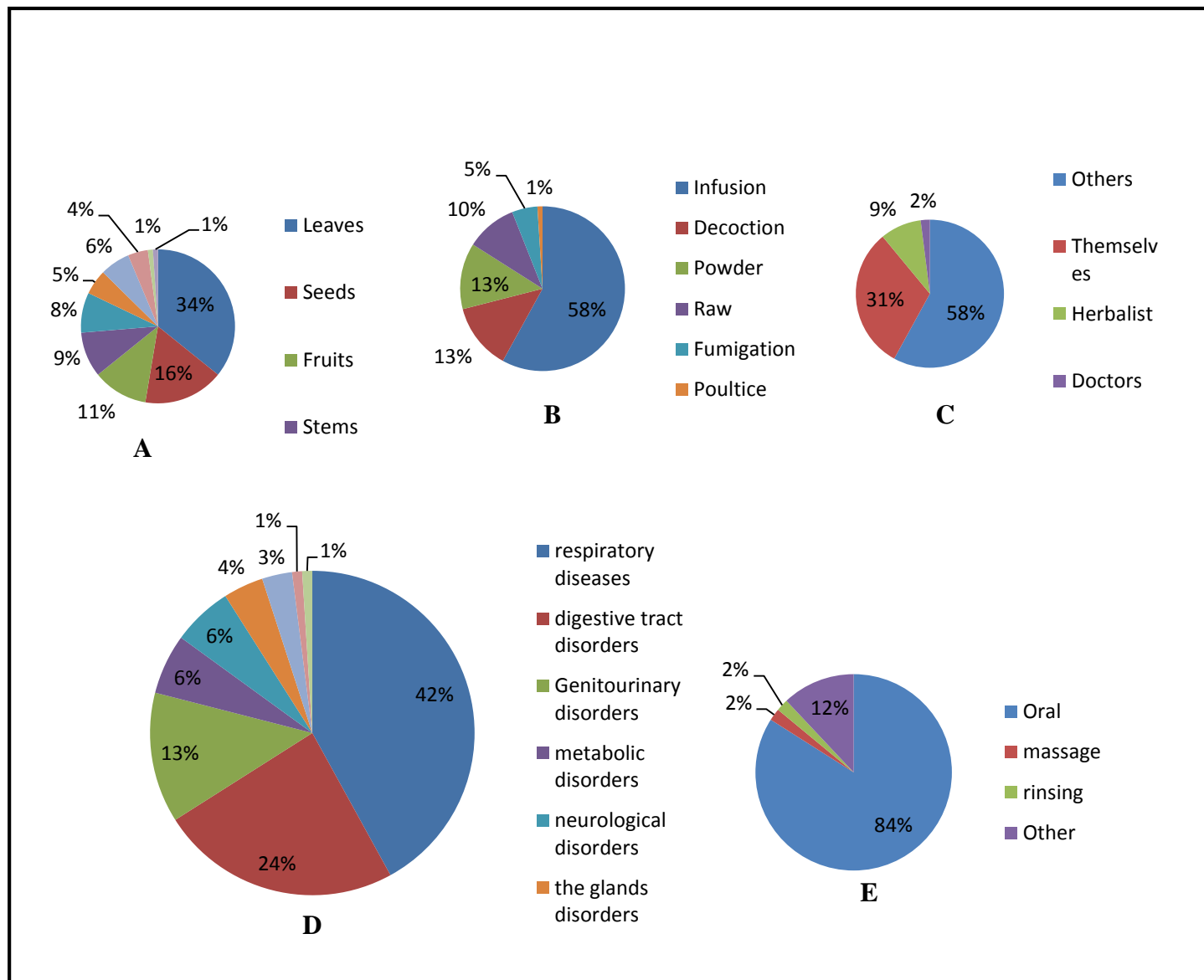


Figure 3: Results of using medicinal plants (A- the part of plant used, B- the method of preparation, C- possession of information, D- the type of illness, E- the mode of administration)

According to the method of preparation

Several modes of preparation are used by the population of Oran whose infusion predominantly by a rate of 58% followed by decoction, powder by a rate of 13%, the fumigation and the poultice by a rate (5% - 1%) (Figure 3, B).

Infusion and decoction are the most common modes that do not present any difficulty

Distribution of users of medicinal plants according to the mode of possession of the information

58% of people in Oran refer to others (experience, friends, TV, internet), and 31% refer to

themselves, and 9% prefer to go to the herbalist and that 2% who take the advice of doctors (Figure 3, C).

Depending on the type of illness

In our ethnobotanical study, respiratory diseases are the most treated diseases with medicinal plants with a percentage of (42%), followed by digestive tract disorders, metabolic and neurological disorders with a percentage of (24%, 6%) the diseases of the glands, dermatological, cardiovascular, osteoarticular by a percentage respectively (4%, 3%, 1%). (Figure 3, D).

Depending on the mode of administration

The majority of people questioned use the oral mode of administration at a rate of 84%, followed by the other modes (12%, 2%). (Figure 3, E).

Grouping of plant species used in the treatment of respiratory diseases

During data processing (Table 1), attempts were made to group the most commonly used species in the treatment of diseases affecting the respiratory system in tabular form.

Table 1: Medicinal Plants Most Used in the Treatment of Respiratory Conditions

Scientific name of plants	Frequency of use
<i>Verbena officinalis</i>	47
<i>Thymus vulgaris</i>	40
<i>Ammi visnaga</i>	31
<i>Zingiber officinalis</i>	14
<i>Eucalyptus globulus</i>	13
<i>Olea europaea</i>	7
<i>Nigella sativa</i>	5
<i>Rosmarinus officinalis</i>	3
<i>Mentha pulegium</i>	2
<i>Lipidium sativum</i>	2
<i>Citrus limon</i>	2

Among the most used species in the treatment of respiratory diseases, we note the majority use of *Verbena officinalis* because it is considered an expectorant used to treat chronic bronchitis, influenza, cough

Floristic Analysis

According to our study in the region of Oran, an enthnofloristic catalog has been developed.

The floristic analysis of the listed species shows that 58 species are used. They are divided into 34 families, of which the Lamiaceae are the majority followed by Apiaceae and Verbenaceae (Table 2).

Table 2: Main medicinal plants used by the population of Oran

Family	species scientific name	Common name	% specific
Apiacées	Pimpinella anisum	Anis vert	
	Carum carvi	Carvi	
	Foeniculum vulgare	Fenouil	
	Cuminum cyminum	Cumin	
	Ammi visnaga	Faux ammi	17,96%
	Daucus carota	Carotte	
	Bunium bulbocastanum	Châtaigne de terre	
Anacardiacees	Pistacia lentiscus	Lentisque	0,47%
Araliacees	Panax ginseng	Ginseng	0,23%
Astéracées	Atractylis gummifera	Chardon à glu	
	Artemisia herba-alba	Armoise blanche	4,25%
	Chamaemelum nobile	Camomille	
Brassicacées	Lipidium sativum	Cresson alénois	0,70%
Cactacées	Opuntia ficus indica	Figuier de barbarie	0,23%
Caryophyllacées	Arenaria serpyllifolia	Sabline	0,50%
Chenopodiacees	Atriplex halimus	Pourpier de mer	0,94%
Cupressacées	Juniperus communis	Genévrier	0,70%
Curcubutacées	Cucurbita maxima	Citrouille	0,23%
Fabacées	Ceratonia siliqua	Caroubier	
	Cassia senna	Séné	2,12%
	Trigonella foenum	Fenugrec	
Illiciacees	Illicium verum	Badiane chinoise	0,23%
Iridacées	Crocus sativus	Safran	0,23%
Lamiacées	Lavandula officinalis	Lavande	
	Mentha pulegium	Menthe pouliot	
	Melissa officinalis	Mélisse	
	Salvia officinalis	Sauge	
	Rosmarinus officinalis	Romarin	29,55%
	Mentha spicata	Menthe	
	Calamintha nepeta	Calament	
	Origanum majorana	Marjolaine	
	Thymus vulgaris	Thym	
Lauracées	Laurus nobilis	Laurier	3,54%
	Cinnamomum laureiri	Cannelle	
Liliacées	Allium sativum	Ail	1,18%
	Allium cepa	Oignon	
Linacées	Linum usitatissimum	Graine de lin	2,36%
Lythracées	Punica granatum	Grenadier	2,12%
	Lawsonia inermis	Henné	
Malvacées	Hibiscus sabdariffa	Karkadé	0,23%
Moracées	Artocarpus altilis	Arbre à pin	0,23%
Myrtacées	Myrtus communis	Myrte	4,01%
	Eugenia caryophyllata	Clou de girofle	
	Eucalyptus globulus	Eucalyptus	
Oléacées	Olea europaea	Olive	0,23%

Poacées	<i>Zea mays</i>	Maïs	0,23%
Rhamnacees	<i>Zizyphus lotus</i>	Jujubier sauvage	0,47%
Rosacées	<i>Prunus persica</i>	Pêcher	0,23%
Rubiacees	<i>Rubia peregrina</i>	Garance des teinturiers	0,70%
Ranunculacées	<i>Nigella sativa</i>	Nigelle	1,70%
Rutacées	<i>Citrus limon</i>	Citron	0,70%
Santalacées	<i>Viscum album</i>	Le Gui	0,94%
Théracées	<i>Camellia thea</i>	Thé	0,23%
Thymniléacées	<i>Daphne gnidium</i>	Daphné garou	0,23%
Urticacées	<i>Urtica dioica</i>	Ortie	0,47%
Verbénacées	<i>Verbena officinalis</i>	Verveine	14,65%
Zingibéracées	<i>Zingiber officinalis</i>	Gingembre	4,72%

CONCLUSION

The ethno botanical study conducted in the region of Oran allowed us to highlight the important place of traditional herbal medicine. The information acquired from the questionnaire cards and the floristic surveys carried out with the population helped us draw up a catalog of 58 plant species belonging to 34 families.

The results of ethno botanical surveys show that most medicinal species in the study area are used extensively in the treatment of the respiratory system. The diseases are mainly treated by the foliage which is the most used vegetable organ and by the infusion which represents the most dominant mode in traditional herbal medicine.

We also note that the taxa most used by users in the Oran region belong to the Lamiaceae family.

We hope that this contribution will highlight more, the wealth of this know-how, since the practice of herbal medicine is left to the popularization and oblivion scientific, legislative and university. On the one hand, it is important to extend this type of investigation to other parts of the country in order to safeguard this precious cultural heritage; and secondly, experimentally validating the remedies identified, by rigorous scientific protocols, because the latter concern only a very small number of plants. In addition, the authorities must intervene by regulating this sector, by promoting studies and research on medicinal plants, to better understand and develop the field. Similarly, this research can serve as a database for further scientific research in that region.

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