AROMATIC AND MEDICINAL PLANTS AND THEIR USE OF THE MASSMOUDA REGION NORTHERN MOROCCO

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Abstract. An ethnobotanical study of medicinal and aromatic plants was conducted in the Massmouda district of the northern city of Ouezzane in Morocco. It was done in order to establish the catalog of aromatic and medicinal plants and to gather all the information concerning the therapeutic uses practiced by the local population in the studied area and finally we sensitize the local population to use medicinal aromatic plants in traditional medicine by a more effective scientific method and preserve nature. After representation of the region, the survey was carried out according to a probabilistic (random) sampling method during the months of January, February and March 2019, among the inhabitants of five douars distributed in the region of Massmouda. Samples of 20 people are trained for each of the douars (10 women and 10 men for each doaur). The questionnaire concerning subjects such as sex, age, educational level, family situation, profession as well as the mode of use, therapeutic and traditional local applications of aromatic and medicinal plants in the Massmouda region. The results obtained made it possible to inventory 21 exploited species, divided into 14 families. Cataloged plants are used for several purposes, with therapeutic use being the most common (90% of total uses). A very important part of the recipes is recommended for the treatment of certain disorders of the digestive system, the nervous system and the cutaneous system. The leaves and the seed are the most used organ. The most frequently used methods of preparation for most remedies are decoction (38%), infusion (25.5%) and finally powder (25%). The ethnobotanical research carried out in the region of Massmouda regarding traditional use of medicinal plants still persists in the said region it is necessary to do other similar works, in the same area of study, will help us to discover other unknown species, to evaluate the risks associated with the use of certain toxic plants and to adopt a new management approach for safeguarding and preserving natural resources.

Keywords: aromatic and medicinal plant; traditional medicine; herbal medicine; Massmouda

Introduction

As in many developing countries, medicinal and aromatic plants have long been the main source of medical care in the absence of adequate medical care

(Jiofac we al., 2009; Mpondo et al., 2012). Morocco, by its biogeographical position, offers a very great ecosystem diversity which is reflected in a floristic diversity (Ghanmi et al., 2011), therefore, it is one of the Mediterranean countries whose populations have for a very long time been engaged in traditional medical practices and have acquired know-how in this field through the use of medicinal plants (Scherrer et al., 2005). Indeed, the Moroccan pharmacopoeia was developed and enriched by the knowledge provided by the different ethnic groups who migrated to Morocco from different regions. Thus, medicinal plants are a treasure trove of information for those who have decided to approach their daily troubles differently, turning their backs on the chemical arsenal of modern medicine. On the social level, this practice would be an alternative way to improve the standard of living of the rural population. In this perspective, the aromatic and medicinal plants (PAM) sector remains a very promising sector in the creation of income-generating activities through the valorization of resources in the commercial and pharmacological component.

The present work aims to carry out a survey of these organizations in the area of Massmouda province of Ouezzane on the exploited plants and their uses in traditional medicine.

Materials and methods

Presentation of the study area

The city of Ouezzane belongs to the southern margins of the country Jebala whose major tribes bordering the city are: Masmouda, Rhouna, Ghzaoua and Beni Mesara (Fig. 1).

The region of Ouezzane extends to the North of Morocco on a surface of 1861,2 km², and has an altitude of 614 meters and is protected from the Atlantic influences by the surrounding mountains of average altitude and benefits from a Mediterranean climate sub-humid with a dry summer season with temperatures between 27°C and 47°C, and a cold winter with temperatures between 6°C and 14°C.

The average annual precipitation is 700 mm. The distribution of this precipitation is irregular.

According to the results of the General Population and Housing Census (RGPH 2014) conducted in 2014, 300,637 inhabitants were identified in the province of Ouezzane made up of almost as many men as women since 50,1% of the total population is male (HCP, 2014).

The literacy rate of the population of the province of Ouezzane is almost 39.2%. (RGPH, 2014).

Due to its geographical position and its climatic context, the Massmouda region offers a great ecological and floristic diversity. Therefore, a phytotherapeutic tradition is strongly represented in this region, Fennane et al., 1999; 2007).

Figure 1. Geographic location of the Massmouda region

Sampling

The survey was conducted using a probability (random) sampling method (Kahoudji, 1995), during the months of January, February and March 2019, among the inhabitants of five douars in the Massmouda region. Samples of 20 people are trained for each of the douars (10 women and 10 men for each doaur) and they are put together to make up the overall sample of 100 people ranging in age from 18 to 85 years old (Table 1).

Table 1. Five douars

N°	Province	Common	Name of douar	Type of zone	Number counted
1	Ouezzane	Massmouda	Genioua	In The Mountains	20
2			Taaonia n°6	Flat next to the river	20
3			Beni malk	In the mountains	20
4			Benihssane	In flat	20
5			Hay sabone	In Flat Along River	20

The questionnaire covers topics such as sex, age, educational level, family situation, profession and how to use, local therapeutic and traditional applications of aromatic and medicinal plants in the Massmouda region (El Oualidi et al., 2012).

Results

Choice between phytotherapy and modern medicine

The results of the survey show that the majority of people surveyed, 91% prefer to use a combination of herbal medicine and modern medicine to treat themselves, our results show that the percentage of the population who resigns to treat themselves only so traditional with herbs at hand is 4% (Fig. 2a). This choice can be explained by the fact that the people questioned are moving towards modern medicine

for very heavy pathologies, while small ailments are treated by traditional medicine / herbal medicine (Alistiqsa et al., 2017).

Use of aromatic and medicinal plants according to sex

In general, women use aromatic and medicinal plants much more than men. The results of the survey show that 73% of women use aromatic and medicinal plants compared to 27% of men surveyed (Fig. 2b). In fact, women have more knowledge of aromatic and medicinal plants than men, for this reason, women who take care of the members of the family. These results confirm those of several ethnobotanical studies carried out on the national territory (Mehdioui & Ksahousdji, 2007; Benkhnigue et al., 2010 – 2011).

Use of aromatic and medicinal plants according to marital status

The results of the survey show that 88% of the people questioned using use aromatic and medicinal plants are married compared to 10% of single persons and 2% of widowers (Fig. 2c) (Mehdioui & Ksahousdji, 2007).

Use of medicinal and aromatic plants by age

Our survey shows that the use of medicinal plants in the Massmouda Circle is widespread among all age groups, with prevalence among people aged 40 to 50 (24%). However, for the age group 18 to 30 years, we note a rate of 16.50%, people aged 30 to 40 years the rate of use of plants is 21%, our results also show that the people aged 50 to 60 years the rate of use of aromatic and medicinal plants is 18.5% and for the oldest people more than sixty, the rate of use of medicinal plants is 20% (Fig, 2d) (Mehdioui & Ksahousdji, 2007).

Use of medicinal and aromatic plants by grade level

In the study area, the illiteracy rate among of medicinal and aromatic plants users is very high at over 66%, followed by people with 25% primary education (Fig. 3b). People with a high school and university level use them very little (respectively 7% and 2%). We can therefore see that the use of PAM decreases as the level of study increases. This result was also obtained by other ethnobotanical studies revealing that the rate of illiteracy was very high among plant users (Lahsissene et al., 2009).

Use of medicinal and aromatic plants by profession

The majority of respondents are housewives 32% and peasants 65%. Our survey shows that the rate of plant use among people who practice masonry is 3% (Fig. 3c). Indeed, the incomes of the inhabitants of the sites of our study come mainly from agriculture and cattle or goat breeding with also some beekeeping farms Lahsissene et al., 2009).

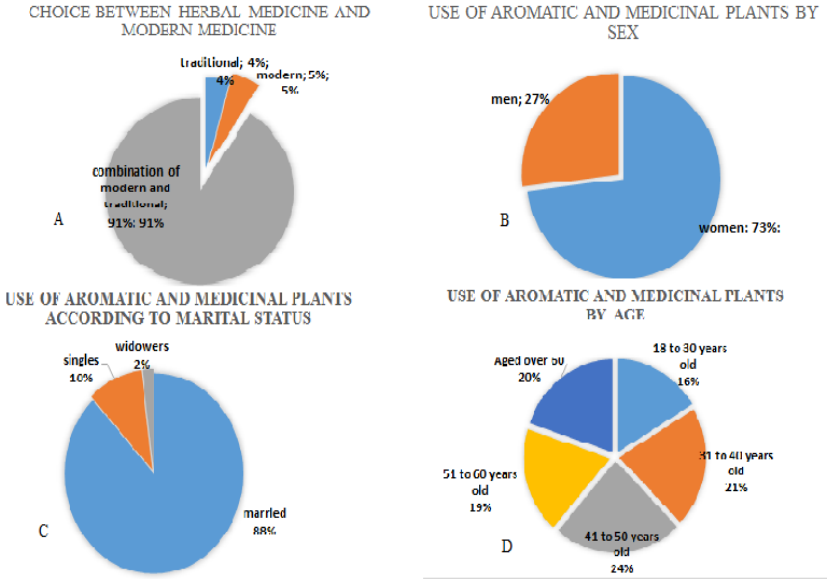

Figure 2. Distribution of users of medicinal and aromatic plants according to modern and traditional medicine (A), sex (B), family situation (C), age (D)

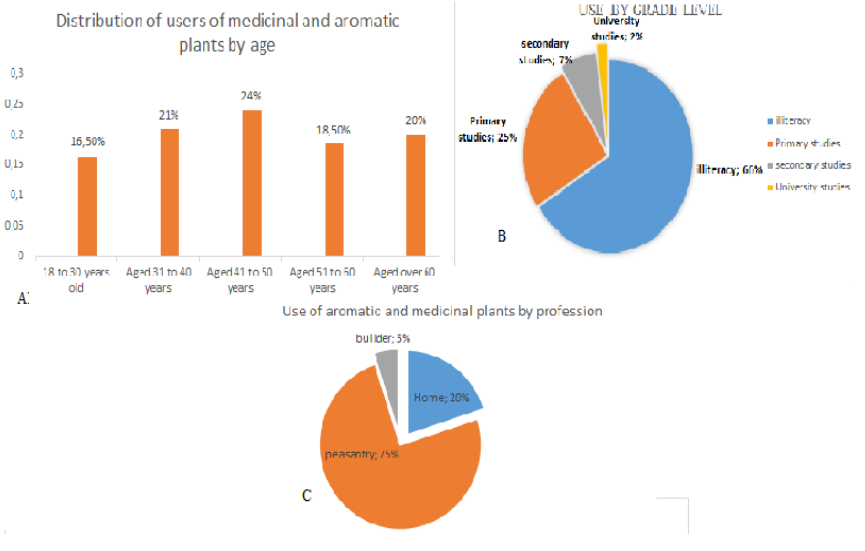

Figure 3. Distribution of users of medicinal and aromatic plants by age (A), grade level (B), occupation (C)

Medicinal species used in the studied area

The field studies have enabled us to develop a catalog of 21 aromatic and medicinal species used by the population of Massmouda, in traditional herbal medicine, which we find particularly interesting.

Monographs of these 21 species are presented in order of distribution in the field. Indeed, for each species, we have specified the vernacular Arabic name, the French vernacular name (Valdès Castrillón et al., 2002), the local use (use specific to the region), other uses (use complemented by science) (Hmamouchi, 1999).

The survey allowed us to highlight 21 species (Appendix) belonging to 14 families. The most represented are Lamiaceae (6 species, oregano (70%), pennyroyal (65%), lavender (30%), round-leaved mint (10%), savory ascendant, Roman (50%)); oleaceae (olive tree 75%), moraceae (fig tree 60,50%), myrtaceae (2 species, myrtle, eucalyptus 35,50%), malvaceae (large mallow 30%), fabaceae (carob tree 20%) (Fig. 4) These species contain essential oils used mainly as carminatives, antiseptics, stomachic and béchiques Practically, almost all these plants grow spontaneously in the forest and the plains (Bellakhdar, 1978; 1997).

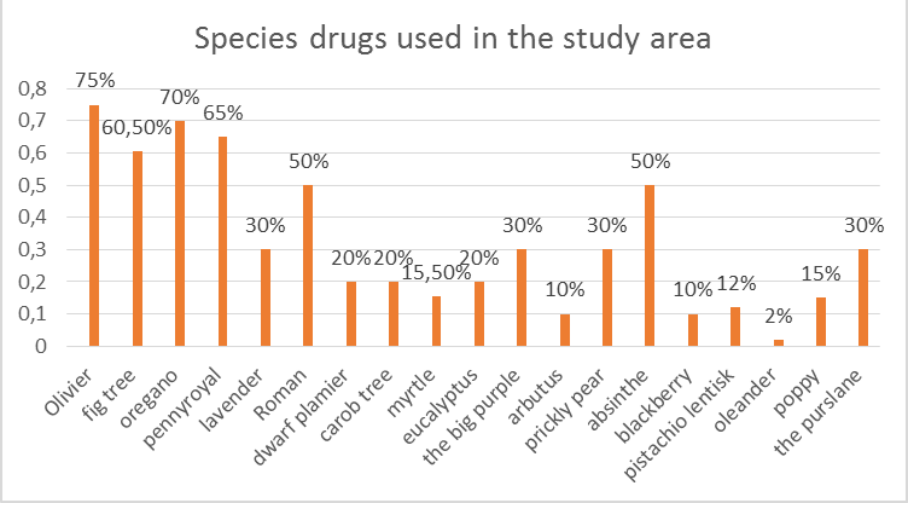

Figure 4. Drug species used in the study area

Areas of therapeutic indication in the studied area

The ethnobotanical survey shows that it is the diseases of the digestive system that are most often treated (31%) by medicinal plants. Then follow skin diseases (15%), genitourinary diseases (14%), diseases of the respiratory system (16.5%), rheumatism (8.50%), hair care (8.50%) neurological condition (4.50%) and cardiovascular disease (2%) (Fig. 5).

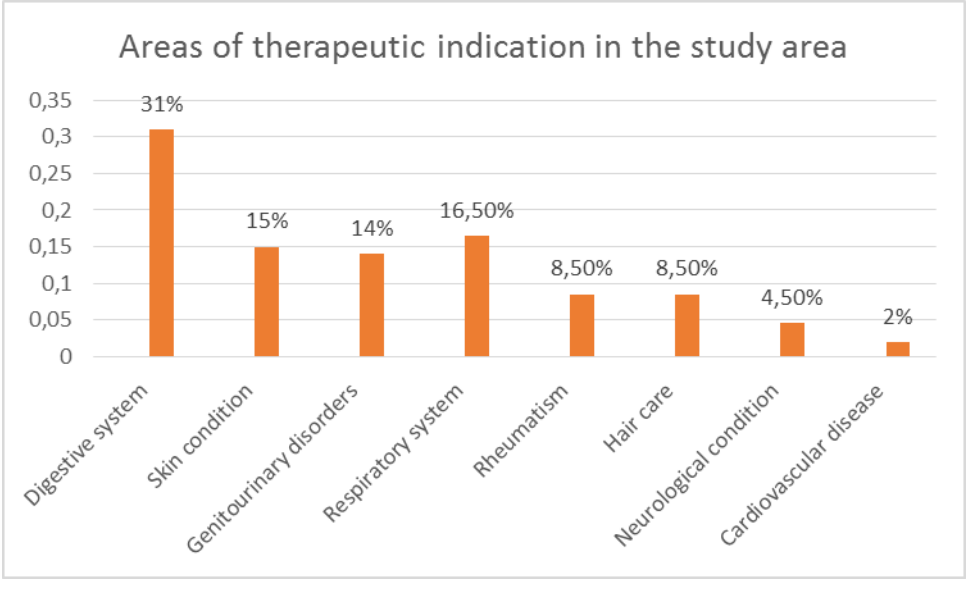

Figure 5. Area of therapeutic use in the study area

Used parts of plants

The ethnobotanical study shows that the leaf is the most used part of the plant at 40%, followed by the leaf / stem at 20%. As for the flower, it represents only 16%, the fruit 13% while the rest: root, bark, seed and stem are used at 11% (Fig. 6a).

Preparation method

Several methods of preparation are used namely decoction, infusion, powder, fumigation, poultice, maceration and brushing. Users of aromatic and medicinal plants are always looking for the easiest methods to prepare phytomedicines.

The ethnobotanical survey shows that the most used methods of preparation are aqueous decoction (38%), infusion (25.5%), powder (25%) and others (11.5%). The decoction makes it possible to collect the most active ingredients and attenuates or cancels out the toxic effect of certain recipes (Fig. 6b).

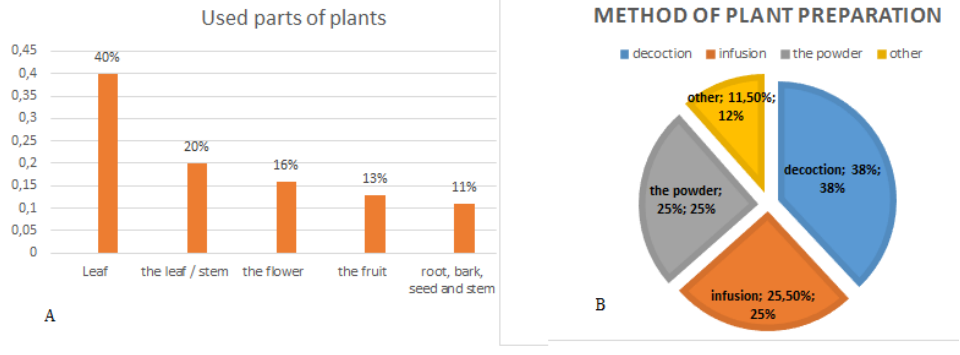

Figure 6. Used parts of plants (A) and method of plant preparation (B)

Discussion

The survey was conducted using a probabilistic (random) sampling method during the months of January, February and March 2019 among the inhabitants of five douars in the Massmouda region. Samples of 20 people are trained for each of the douars (10 women and 10 men for each doaur) and they are put together to form the overall sample 100 people ranging in age from 18 to 85 years. The questionnaire concerning subjects such as sex, age, educational level, family situation, profession as well as the mode of use, therapeutic and traditional local applications of aromatic and medicinal plants in the Massmouda region.

Our result shows that the use of aromatic and medicinal plants is more often in this region, we found that almost 91% of population of the Massmouda region use medicinal plants to cure small ailments.

Women used (73%) more aromatic and medicinal plants than men (27%) because women are still related to cooking and have more information about plants than men.

Our survey shows that the use of medicinal plants in the Massmouda region is widespread among all age groups, with prevalence among people aged 40 to 60 (40%) and in the married population (88%) to minimize the cost of modern medicine and travel expenses to the city of Ouezzane. In the study area, the illiteracy rate among WFP users is very high by more than 66%.

The survey allowed us to highlight 21 species (Appendix) belonging to 14 families. These species contain essential oils used mainly as carminatives, antiseptics, stomachic and béchiques Practically, almost all these plants grow spontaneously in the forest and the plains. The most represented are Lamiaceae (6 species, oregano (70%), pennyroyal (65%), lavender (30%), round-leaved mint (10%), savory ascendant, Roman (50%)); oleaceae (olive tree

75%), moraceae (fig tree 60,50%), myrtaceae (2 species, myrtle, eucalyptus 35,50%), malvaceae (large mallow 30%), fabaceae (carob tree 20%) (Fig. 4). The ethnobotanical survey shows that it is the diseases of the digestive system that are most often treated (31%) by medicinal plants. Then follow skin diseases (15%) and diseases of the respiratory system (16.5%), rheumatism (8.50%) (Fig. 5).

The users of aromatic and medicinal plants are always looking for the easiest methods to prepare phytomedicines, the ethnobotanical survey shows that the most used methods of preparation are the aqueous decoction (38%), the infusion (25.5%) , the powder (25%) (Fig. 6b).

Conclusion

The ethnobotanical study carried out in the Massmouda region has allowed us to highlight the important role of traditional herbal medicine.

The information gained from this field-based study helped us to develop a catalog of 21 (14) plant families and their use in this area.

It is also noted that the taxa most used by users of Massmouda olive, fig and plants that belong to the family of Lamiaceae and are oregano (Origanum compactum L.), as well as pennyroyal (Mentha pulegium L.). These species contain essential oils used mainly as carminatives, antiseptics, stomachic and Bechic.

The results of this ethnobotanical study show that most medicinal species, from the study area, are widely used in the treatment of the digestive system, the respiratory system and the circulatory system. These devices are mainly treated by the foliage which is the most used plant organ and by the decoction which represents the most dominant mode in traditional herbal medicine.

Finally, it is clear from these ethnobotanical research carried out in the Massmouda region that the traditional use of medicinal plants still persists in the region, despite the revolution in medical technology. Other similar work in the same study area will help us discover other unknown species, assess the risks associated with the use of certain poisonous plants and adopt a new management approach for the safeguarding preservation of natural resources.

Significance statement

This study shows that the use of aromatic and medicinal plants is more often in this region, we have found that the population of the Massmouda region use medicinal plants to cure small ailments with traditional methods and it can be more dangerous returns on their health, for this it is necessary to do studies or similar work, in the same zone of study, will help us to discover other unknown species, to evaluate the risks consequent to the use of certain toxic plants and to adopt a new management approach for safeguarding and preserving natural resources.

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APPENDIX: Technical sheet

Questionnaire for medicinal plants and herbal medicine

▪ Date ....

▪ Common ....

Informant:

▪ Age: .....

▪ Profession: farmer □ housewife □ bricklayer □ Without □

▪ Family Status: Single □ Married □

▪ Gender: Male □ Female □

▪ Academic level: Without □ Primary □ Middle school □ High school □ University

▪ Locality: Douar in the mountains □ Douar in a flat □ Douar next to the river □

▪ Traditional medicine □ Modern medicine □ Both □

Plant material:

▪ Vernacular name: .....

▪ Scientific name: .....

▪ Type of plant: Wild □ Cultivated □

▪ Use of the plant: Therapeutic □ Cosmetic □ Other □

▪ Harvesting Technique: Manual □ Mechanical □

▪ Time of harvest (season): ....

▪ Condition of the plant: Fresh □ Dried □ After treatment □

▪ If dried, drying method: .....
▪ Part used: Stem □ Fruit Flowers □ Seed □ Bark □ Rhizome □
Bulb □ Leaves □ Whole plant □
Other combinations □: .....
▪ Form of use: Herbal tea □ Powder □ Essential oils □ Oils
fat □ Extract (tincture, solution, capsule) □: .....
▪ Method of preparation: Infusion □ Decoction □ Poultice □ powder □
maceration □ Other □:
▪ Dose used: Pinch □ handle □ Spoonful □

Plants:
▪ Method of administration: Oral □ Massage □ Rinsing □ Basting □
Other □: .....
▪ Conservation method: Protected from light □ Exposed to light □
▪Other Use:

Type of disease:
▪ Skin conditions □
▪ Genitourinary infections □
▪ Disorders of the gastrointestinal tract □
▪ Neurological disorders □
▪ Respiratory conditions □
▪ Ortoidal disorders □
▪ Cardiovascular disorders □
▪ Metabolic disorders □
▪ Conditions of the glands attached to the digestive tract □
▪ Diagnosis By: Himself □ Physician □ Herbalist □ Others □: ...
▪ Results: Healing □ Improvement □ Ineffective □
▪ Side effect: ....
▪ Toxicity: ....
▪ Precaution for use: ....

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