



## Medical Pluralism in the Oriental Morocco

Jamila Fakchich <sup>\*1</sup>, Mostafa Elachouri M. <sup>1</sup>

<sup>1</sup> Laboratory of Bioresources, Biotechnology, Ethnopharmacology and Health. Faculty of Sciences, Mohammed First University, Oujda, Morocco

\*Corresponding author, Email address: [fakchich.jamila@yahoo.com](mailto:fakchich.jamila@yahoo.com) ; [elachourimostafa@yahoo.fr](mailto:elachourimostafa@yahoo.fr)

Received 04 Aug 2023,

Revised 07 Sept 2023,

Accepted 08 Sept 2023

### Keywords:

- ✓ pluralism
- ✓ ethnomedicine,
- ✓ therapeutic systems
- ✓ Oriental Morocco
- ✓ medicinal plants

**Citation:** Fakchich J., Elachouri M., (2023) Medical Pluralism in the Oriental Morocco, *J. Mater. Environ. Sci.*, 14(9), 1109-1122

**Abstract: Objectives:** Diagnostic and therapeutic systems reflect the needs and attitudes of society. This study aimed to highlight the pluralism of therapeutic systems in the Oriental region of Morocco with the objective of developing a national strategy to safeguard public health. **Methods:** An ethnomedical research was conducted to study the therapeutic system and inventory the existing diseases among the population in the Oriental region of Morocco. A total of 3151 individuals aged over twenty years were surveyed in four prefectures/provinces (*Oujda-Angad, Berkane, Nador, and Figuig*). The survey was carried out by undergraduate students. **Results:** The survey revealed 23 diseases and disorders affecting different systems of the human body. Among these disorders, the most prevalent were related to the digestive system, respiratory problems, diabetes, cardiovascular disorders, bone and joint issues, and renal problems, listed in descending order. The population treats these diseases using various methods, with the most common being conventional medications and phytotherapy, with percentages of 85.5% and 65.7% respectively. **Conclusion:** It is essential to incorporate useful traditional medical practices into the provision of healthcare, especially at the primary healthcare level. This can be achieved by adopting a national list of effective and safe traditional therapeutic practices, formulating national policies concerning traditional medicine, and developing healthcare infrastructure tailored to the needs and attitudes of the respective populations.

### 1. Introduction

Morocco is a historically rich nation with a deeply ingrained culture where medicine has played a vital role. Traditional medicine holds a significant position in healthcare systems, coexisting with conventional medicine. Moroccan traditional medicine predates the Arab influences, with the Berbers practicing therapeutic techniques that continue to be used today. This form of medicine flourished during the era of prominent figures such as Avenzoar, *Averroes*, *Ibn Tofail*, *Ibn Chekroun*, *El Ghassani*, and *El Alami*, who contributed to the distinctive essence of Moroccan medicine. Its teachings were imparted at the University of *Al Quaraouiyine* in Fes during the 8th to 12th centuries. Morocco is characterized by a pluralistic healthcare system, where traditional medicine coexists with modern medicine. This medical pluralism is influenced by the country's cultural and ethnic diversity, as well as varied regional practices. According to a study conducted by [Rhalem et al. \(2016\)](#) and [Alami Merrouni & Elachouri M. \(2023\)](#), countries in the Maghreb region, including Morocco, have pluralistic healthcare systems where traditional medicine plays a vital role.

Traditional healers, also known by different names such as "*tabib*" or "*fqih*" (fakchich et al., 2023), hold a central place in this pluralism of traditional medicine in Morocco. They practice diverse healing approaches, ranging from the use of medicinal plants to prayer rituals and massages (Lahlou, 2013). The medical pluralism in Morocco also translates into the coexistence of traditional medicine with modern medicine. Many Moroccans consult both traditional healers and modern healthcare professionals, depending on their preferences and personal beliefs (Lahlou, 2013; ; El haouari et al., 2018). The Moroccan government recognizes the significance of traditional medicine in addressing the health needs of the population. Efforts have been made to integrate certain traditional practices into the official healthcare system of the country (Rhalem et al., 2016; El Yahyaoui et al., 2018; El Ouariachi et al., 2011). The pluralism of traditional medicine in Morocco reflects the country's cultural richness and how ancestral medical practices continue to influence healthcare in various communities. In modern times, a considerable number of Moroccans frequently turn to various traditional therapies to diagnose, prevent, and treat ailments prevalent in our society (Elachouri et al., 2018). However, this practice lacks proper regulation and oversight, operating without any formal control mechanisms. The involvement of the Ministry of Public Health in this field is currently limited to providing training and equipment to specific traditional midwives, primarily to enhance home childbirth conditions. Furthermore, conventional medicine also holds significant importance within Morocco's healthcare system. Nevertheless, doctors in our country often find themselves unprepared to practice medicine in a sociocultural context that remains deeply rooted in tradition. Despite their formal education and theoretical knowledge, they frequently feel perplexed when faced with patients' psychosomatic issues, which are heavily influenced by cultural beliefs and customs.

This work aims to study the therapeutic system and inventory the existing diseases among the population in the Oriental region of Morocco. This study falls within the scope of research aimed at developing one of the research themes of the Department of Biology, namely: ethnobotanical and ethnopharmacological study in Oriental Morocco, seeking opportunities for the application of traditional medicine in the healthcare system of our country, to leverage its advantages and avoid its drawbacks.

## 2. Methodology

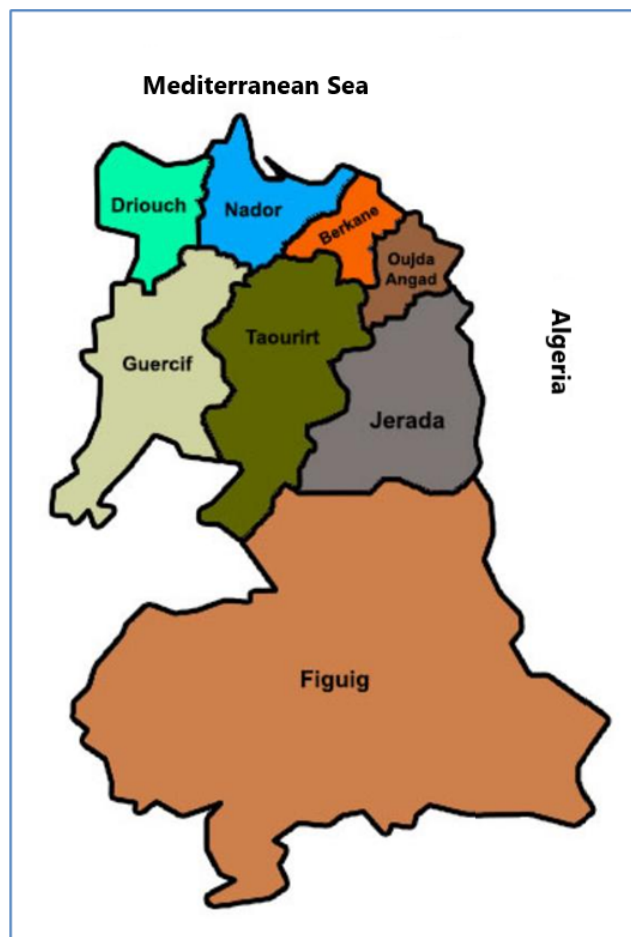
### 2.1 The region of the survey

Morocco lies between the Mediterranean and the Atlantic, often referred to as the "Land of the setting sun," covering 710,850 km<sup>2</sup>. Its varied geography, encompassing the sea, Sahara Desert, and high mountains, contributes to a highly diverse climate. Consequently, three distinct climatic zones can be identified: the Atlantic zone, the mountainous zone, and the eastern zone. The diverse ecological conditions have fostered the growth of over 42,000 plant species, categorized into 150 families and 940 genera (Jahandiez et al., 1931/1934; Maire, 1952/1980; Negre, 1961; Ozenda, 1977).

The Eastern Plateau is situated between the High Atlas and the Middle Atlas, extending from the *Moulouya* Valley in the west to the Algerian border in the east. Surrounded by mountain ranges (*Beni-Snassen* and Horsts chains) and close to the Mediterranean Sea, the Oriental region of Morocco enjoys a diverse climate and flora. This area hosts 471 medicinal species and subspecies, making up 11% of Morocco's flora, distributed across 302 genera, representing about 34% of all genera in the country, and belonging to 85 families, accounting for approximately 69% of the total. In 2021, the population of the Oriental region of Morocco was approximately 2.3 million inhabitants. The region is characterized by cultural and ethnic diversity, with a significant presence of Berber and Arab

populations. Living conditions in the Oriental region can vary depending on the areas. The main cities, such as **Oujda**, **Nador**, and **Berkane**, generally benefit from more developed infrastructure and relatively better access to basic services such as education, healthcare, and transportation. These urban areas may also offer more economic opportunities and jobs. However, some more rural parts of the region may face challenges in accessing services and infrastructure. Education and economic development levels can be lower in these areas, which can influence the living conditions of the inhabitants.

The Oriental region is also known for its agriculture and agro-food sector, which plays a significant economic role in people's lives. However, socio-economic disparities may exist between different parts of the region. According to the 2004 census data, the healthcare system in the Oriental region of Morocco comprises both public and private infrastructure. In terms of public facilities, there are a total of 107 Basic Health Care Facilities (RSSB) and 7 Hospital Facilities (RH) with a combined capacity of 1,760 beds (Figure 1). On the other hand, the private sector also plays a significant role in providing healthcare services. The for-profit Private Sector (SPBL) operates 11 clinics, providing an additional 445 beds for patients. Additionally, the non-profit Private Sector (SPBNL) manages 2 hospitals, offering 73 beds for medical care.



**Figure 1.** Administrative division of Oriental Morocco

The combination of public and private healthcare facilities helps cater to the healthcare needs of the population in the Oriental region. These facilities play a crucial role in delivering medical services, ranging from basic healthcare to more specialized treatments, contributing to the overall well-being of the residents in the region.

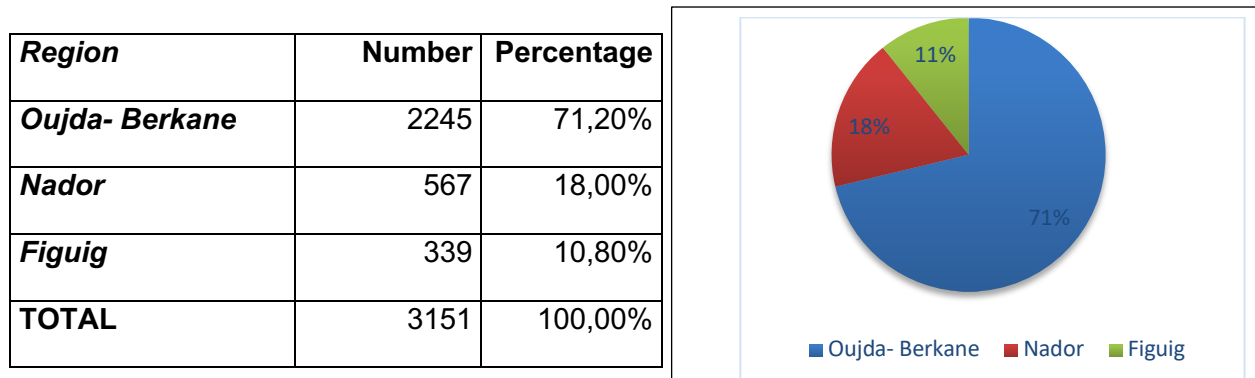
## 2.2 Ethnomedical Survey

The ethnomedical survey took place across four different sectors in the Oriental region of Morocco: Oujda-Angad prefecture, **Berkane** province, **Nador** province, and **Figuig** province. A total of 3151 residents aged over 20 years participated in providing ethnomedical information. The interviews were conducted by biology undergraduate students, who received training to ensure a consistent approach in data collection. The students conducted direct interviews to gather a comprehensive understanding of the subject. All participants were fully informed about the study's objective, and local authorities granted permission for the execution of this survey.

## 3. Results and Discussion

### 3.1 Diseases and Disorders Affecting the Population

The survey reached over 3245 individuals, among whom 3151, both women and men, were successfully interviewed, representing 71.2% (2245) from the **Oujda-Berkane** region, 18% from **Nador** (567), and 10.8% (339) from **Figuig** (Figure 2).



**Figure 2.** Distribution of the sample by residential regions (no-responses were excluded)

### 3.2 Diseases and Disorders Affecting the Population

Among the 3151 individuals who were interviewed, 2679 mentioned that they suffer from one or more diseases (85.3%), while 480 either did not respond or reported being healthy (14.7%). More than 23 categories of pathologies or diseases were found to affect the interviewed population (Table 1). From the analysis of the collected data, seven major categories of prevalent pathologies can be identified. They are, in order of importance: digestive system disorders (32.5%), cardiovascular pathologies (16.6%), diabetes (12.9%), allergy-related issues (11.5%), respiratory system problems (10.3%), dermatological issues (9.3%), bone and joint problems (8.1%), and urinary system pathologies (6.1%) (Table 1).

### 3.2 The therapeutic methods practiced among the population.

Among the population of the Oriental region of Morocco, the etiology of the disease, whether it is classified as "organ-related disease," "malevolent disease," or "**Djin**-related disease," determines the type of therapeutic approach. As a result, several types of therapies can be distinguished: traditional medicine and modern medicine. Given the vastness of the subject, we have chosen to focus on the most significant ones: herbal medicine and conventional medicine.

### 3.2.1 Phytotherapy Medication

#### 3.2.1.1 The percentage of phytotherapy usage

Within the 3151 successfully interviewed individuals, 3088 respondents answered the question regarding the use of medicinal plants. The prevalence of medicinal plant usage was found to be 65.7% among the population. Previous studies by various authors have indicated that the percentage of medicinal plant usage ranged from 55% to 95%, depending on the specific region where the survey was conducted.

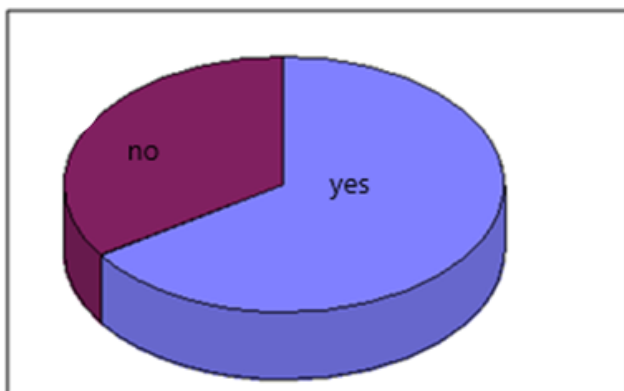
**Table 1.** The diseases and therapeutic purposes identified among the population in the Oriental Morocco

| Codes Diseases | Therapeutic purposes   |
|----------------|--|
| Pcard          | Cardiovascular pathologies : hypertension, hypotension, heart failure...                 |
| Dia            | Diabetes: type I and type II   |
| Alerg          | Allergy-related issues: asthma, hypersensitivity...                                      |
| Presp          | Respiratory system problems: lung pathologies, bronchitis, cough...                      |
| Pdermo         | Dermatological and dermocosmetology issues: skincare, hair care, scalp care...           |
| Pmusq          | Musculoskeletal problems: Rheumatism, herniated disc, sprain, fracture, sciatic nerve... |
| Pren           | Urinary system pathologies   |
| Pcir           | Circulatory system pathologies   |
| Prep           | Reproductive system pathologies  |
| Psn            | Nervous system problems  |
| Poil           | Vision and eye problems  |
| Pden           | Oral and dental sphere issues  |
| Porl           | Hearing and ear problems   |
| Fiev           | Fever  |
| Pfroi          | Cold-related problems: flu, cold, common cold...   |
| Intox          | Food poisoning and poisoning by scorpions and snake venoms                               |
| Pali           | Eating-related problems: obesity, loss of appetite, anemia, general fatigue...           |
| Ptete          | Headaches, migraines   |
| Chol           | Cholesterol  |
| Pmicro         | Microbial infection  |
| Cancer         | Cancer   |
| Others         | goiter, cyst, thyroid, sodium retention...   |

The Percentage of medicinal plant usage varies across regions, influenced by factors such as ethnology, the availability of medicinal plants in the area, and family traditions (Fakchich and Elachouri, 2014; El-Hilaly *et al.*, 2003; Eddouks, *et al.*, 2002; Hmammouchi, 1999; Bellakhdar, 1997; Ziyyat *et al.*, 1997; Sekkat, 1987). These findings underscore the ongoing practice of phytotherapy in the Oriental region, as well as in other regions of Morocco (Fakchich and Elachouri, 2021) (Figure 3).

#### 3.2.1.2 Plant Usage According to Residence

Out of 2485 individuals interviewed residing in urban areas, 2441 responded to the question, with 61.7% using medicinal plants. Among the 547 individuals living in rural areas, 532 responded, and 83.1% reported using medicinal plants. This indicates that rural residents are the primary consumers (83.1%) of medicinal plants, as rural or post-rural societies maintain a strong connection with nature, providing them with abundant resources (El Beghdadi, 1991).

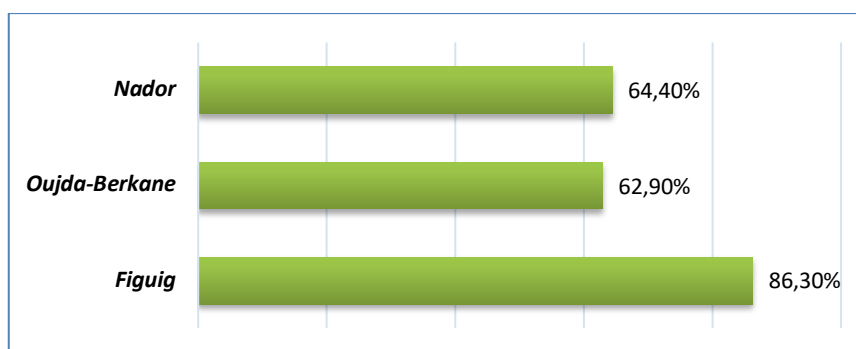


| U.P.M          | Effectif    | Pourcentage   |
|----------------|-------------|---------------|
| yes            | 2028        | 65,7%         |
| no             | 1060        | 34,3%         |
| <b>TOTAL :</b> | <b>3088</b> | <b>100,0%</b> |

**Figure 3.** Number and percentage of medicinal plant uses

### 3.2.1.3 Plant Usage According to Regions

The data shows that the utilization of medicinal plants is more significant in the **Figuig** region compared to **Oujda-Berkane** and **Nador**, with percentages of 86.3%, 62.9%, and 64.4% respectively. This can be explained by the fact that the province of **Figuig** has a rural aspect, and despite infrastructural development, the oases remain isolated areas. Thus, access to modern healthcare systems may not always be easy, while medicinal plants are readily available in all villages (Figure 4).



**Figure 4.** Plant usage by regions

### 3.2.1.4 Plant Usage According to Age

The data analysis reveals that 66.7%, 67.3%, and 59.9% of individuals aged between 20 and 30 years, between 30 and 60 years, and over 60 years respectively use medicinal plants. These results indicate that plant usage is distributed in a similar manner among the two younger age categories, but older individuals (over 60 years) use medicinal plants less frequently. This can be explained by the fact that this age group tends to consult doctors due to the presence of chronic diseases (such as diabetes, heart problems, cholesterol, and muscular issues) that require specialized medical attention and monitoring (Figure 5).

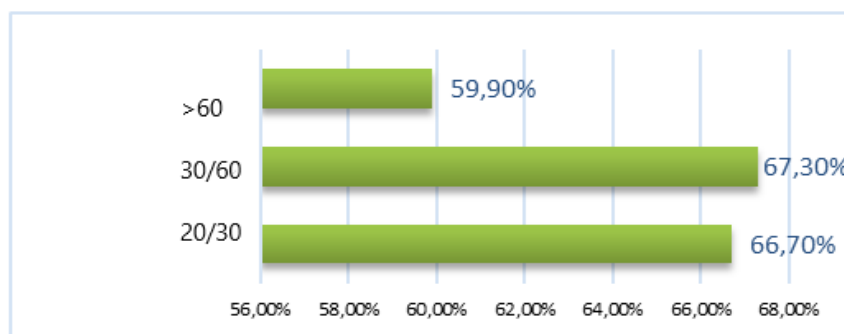
### 3.2.1.5 Plant Usage According to Gender

The data analysis reveals the following:

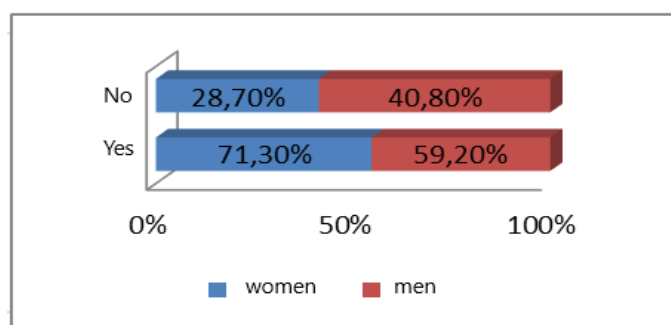
Among the 1657 women who responded to the question, 1181 (71.3%) use medicinal plants, while 476 (28.7%) do not use them.

Men use medicinal plants with a percentage of 59.2%, accounting for 848 individuals out of the 1432 who responded to the question.

These results show that women are the primary consumers (71.3%) of medicinal plants compared to men (59.2%). Some previous studies have also shown a similar trend with percentages ranging from 61% to 65% for women and 35% to 39% for men (Jouad, 2001; Ziyat, *et al.*, 1997; Jaouad, 1992; Nabih, 1992; El Beghdadi, 1991; Hamdani, 1984). This could be explained by the ease of information transmission among women and their stronger attachment to traditional knowledge compared to men (Jouad, 2001; Nabih, 1992; Hamdani, 1984) (Figure 6).



**Figure 5.** Plant usage by regions (the age: 20/30: range of 20 to 30 years, 30/60: range of 30 to 600 years, >60: 60 years and above)



**Figure 6.** Plant usage by gender

### 3.2.1.6 Plant Usage According to Socioeconomic Status

Individuals with a lower socioeconomic status automatically rely more on medicinal plants (69.2%) compared to other population categories with a medium or high socioeconomic level. This is due to the fact that families in the region with lower incomes increasingly turn to traditional medicine, which remains more affordable.

### 3.2.1.7 Plant Usage According to Family Situation and Education Level

In all groups, the number of plant users was significant and did not depend on the family situation or education level.

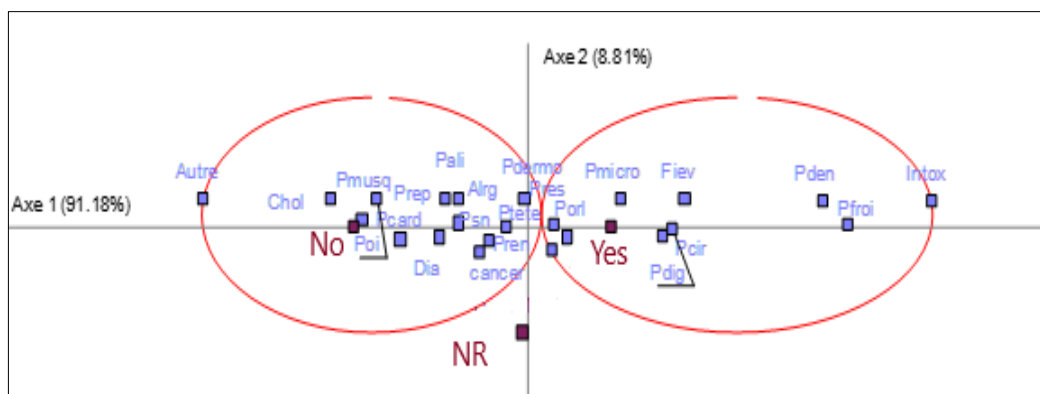
### 3.2.1.8. Relationship between Diseases and Phytotherapy

The factor map (PCA) reveals an interesting pattern: individuals with chronic conditions such as diabetes, cardiovascular diseases, cholesterol issues, and kidney pathologies tend to use medicinal plants less frequently for their treatments. In contrast, phytotherapy plays a more prominent role in the treatment of other diseases among the surveyed population (Figure 7).

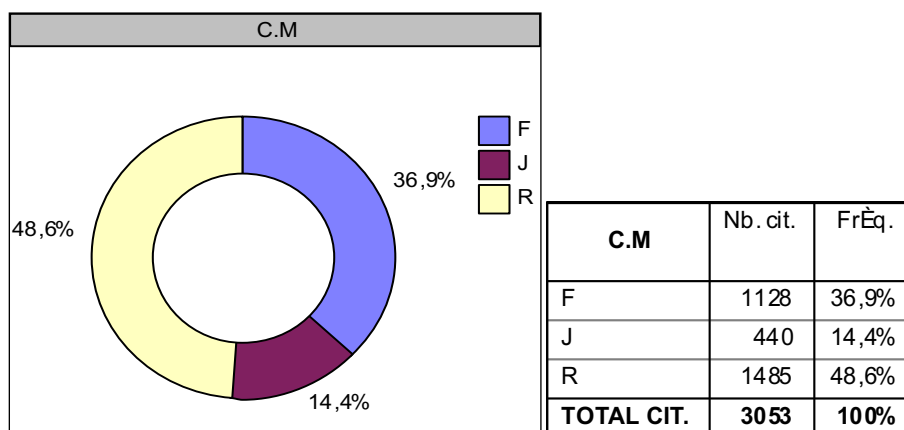
### 3.2.2. Medication through Conventional

#### 3.2.2.1 Medical Consultation Percentage

Out of the 3151 individuals successfully interviewed, 3053 responded to the question regarding medical consultation, resulting in a response rate of 96.8%. Among those who answered the question, 85.5% reported seeking medical consultation. Of these, 48.6% consult doctors rarely, while 36.9% do so frequently. These findings indicate a significant prevalence of modern medicine usage in the Oriental region of Morocco, in contrast to other studies that have shown a much lower utilization rate (23%) (Tahraoui A., 2006) (Figure 8).



**Figure 7.** The distribution of diseases and therapeutic purposes according to the use of medicinal plants (NR: no-responses)



**Figure 8.** Number and percentages of medical consultation within the interviewed population (C.M (Medical Consultation within the Interviewed Population, F: frequently, R: rarely, J: never)

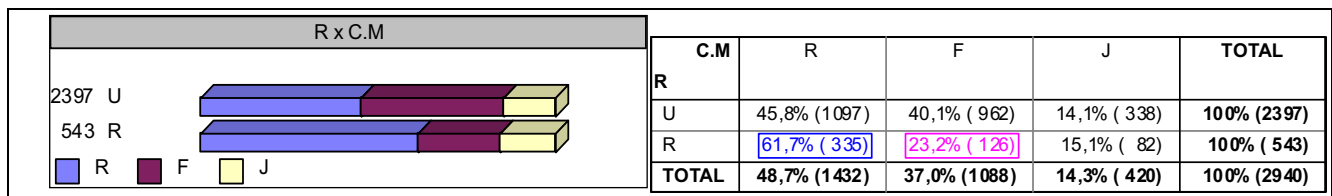
#### 3.2.2.2 Percentage Medical Consultation According to Place of Residence

The analysis shows that 40.1% of urban residents frequently consult doctors, while only 23.2% of rural residents do so, mainly due to the limited accessibility of conventional medicine for the majority of the rural population. Traditional medicine remains the primary recourse for a significant segment of the rural population (83.1%) (Figure 9).

#### 3.2.2.3 Percentage Medical Consultation According to Age

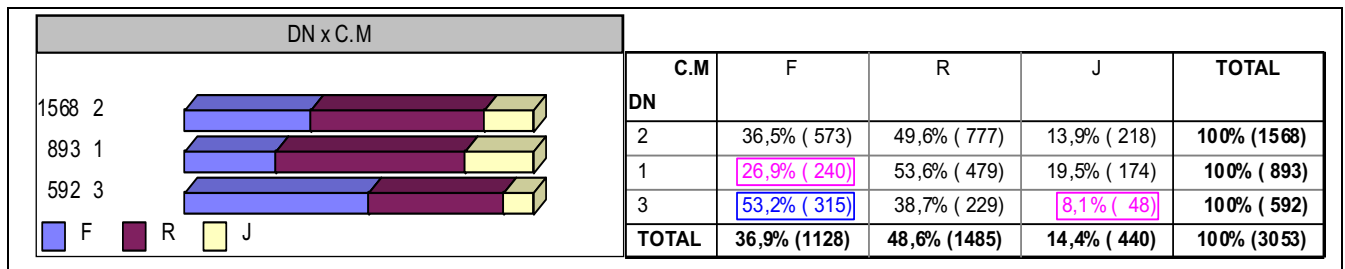
Medical consultation is well-represented across all age groups, with particular importance among the elderly (over 60 years) who frequently consult doctors at a rate of 53.2%. This can be explained by the presence of chronic diseases in this age group, which necessitate specialized medical attention and monitoring (Figure 10).





C.M (Medical Consultation within the Interviewed Population), F (Frequently), R (Rarely), J (Never), U (Urban), R (Rural). The dependency is highly significant. The cells highlighted in blue (pink) are those for which the actual count is significantly higher (lower) than the expected count. The chi-2 test is calculated on the table of citations (marginal counts equal to the sum of row/column counts). The table values are row percentages based on 2940 citations.

**Figure 9.** Number and Percentage of Medical Consultation within the Interviewed Population by Residence

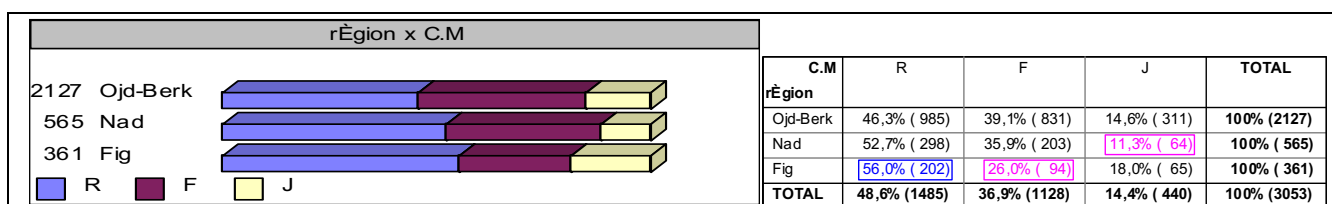


C.M (Medical Consultation within the Interviewed Population), F (Frequently), R (Rarely), J (Never). DN (Date of Birth), 1 (Aged 20 to 30), 2 (Aged 30 to 60), 3 (Aged over 60). The dependency is highly significant. The cells highlighted in blue (pink) are those for which the actual count is significantly higher (lower) than the expected count. The chi-squared test is calculated on the table of quotes (marginal counts equal to the sum of row/column counts). The table values are row percentages based on 3053 citations.

**Figure 10.** Number and Percentage of Medical Consultation within the Interviewed Population by Age

### 3.2.2.4 Medical Consultation According to Regions

The results indicate that residents of *Oujda-Berkane* and *Nador* frequently consult doctors to a significant extent (39.1% and 35.9% respectively) compared to residents of *Figuig* (26%). This can be attributed to the limited accessibility of conventional medicine and a lower socioeconomic status among the population of *Figuig* (Figure 11).



C.M (Medical Consultation within the Interviewed Population), F (Frequently), R (Rarely), J (Never), Ojd-Berk (*Oujda-Berkane*), Nad (*Nazor*), Fig (*Figuig*). The dependency is highly significant. The cells highlighted in blue (pink) are those for which the actual count is significantly higher (lower) than the expected count. The chi-squared test is calculated on the table of quotes (marginal counts equal to the sum of row/column counts). The table values are row percentages based on 3053 citations.

**Figure 11.** Number and Percentage of Medical Consultation of the Interviewed Population by Region

### 3.2.2.5 Medical Consultation According to Gender

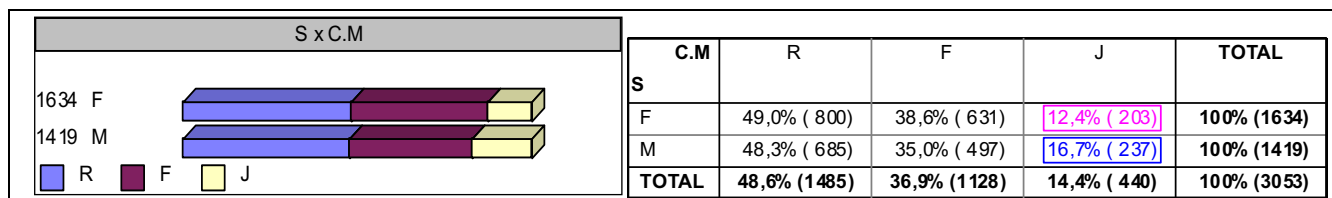
The distribution of medical consultation is relatively similar between both genders. It is observed that the percentage of women who have never consulted a doctor is lower compared to men. This can be explained by the fact that women face various health issues, especially related to the reproductive system, pregnancy, childbirth, etc., which require them to consult doctors (Figure 12).

### 3.2.2.6 Medical Consultation According to Family Situation

Unmarried individuals consult doctors frequently with a low percentage (25.8%), which can be explained by the fact that this population category is young and generally healthy.

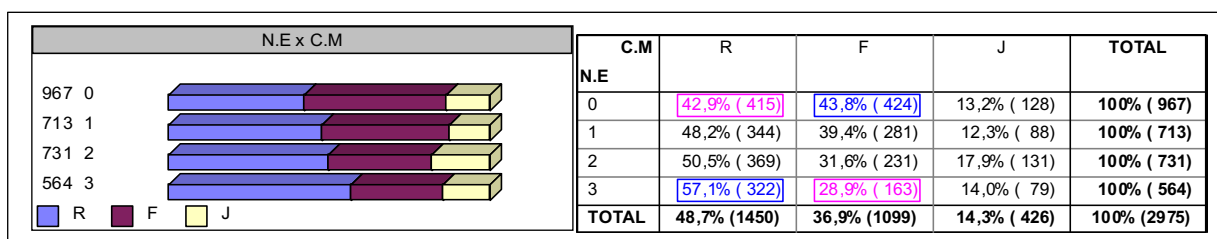
### 3.2.2.7 Medical Consultation According to Education Level

Individuals with higher education levels consult doctors more frequently with a low percentage (28.9%), which can be attributed to the fact that this age group is younger and has not yet developed significant health issues (Figure 13).



C.M (Medical Consultation within the Interviewed Population), F (Frequently), R (Rarely), J (Never), S (Gender), F (Female), M (Male). The dependency is highly significant. The cells highlighted in blue (pink) are those for which the actual count is significantly higher (lower) than the expected count. The chi-squared test is calculated on the table of quotes (marginal counts equal to the sum of row/column counts). The table values are row percentages based on 3053 citations.

Figure 12. Number and Percentage of Medical Consultation within the Interviewed Population by Gender

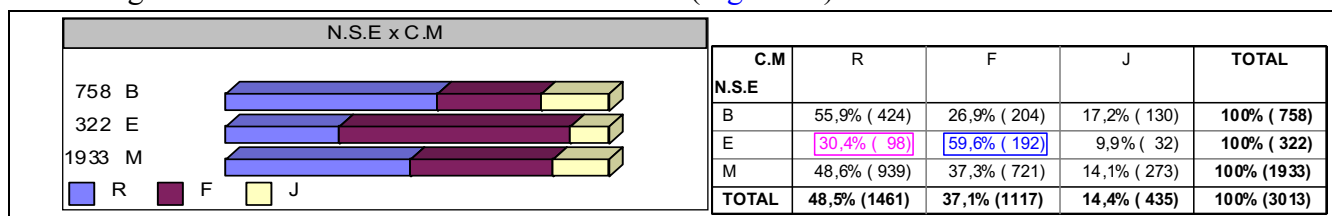


C.M (Medical Consultation within the Interviewed Population), F (Frequently), R (Rarely), NE (Educational Level), 0 (Illiterate), 1 (Primary), 2 (Secondary), 3 (University). The dependency is highly significant. The cells highlighted in blue (pink) are those for which the actual count is significantly higher (lower) than the expected count. The chi-squared test is calculated on the table of quotes (marginal counts equal to the sum of row/column counts). The table values are row percentages based on 2975 citations.

Figure 13. Number and Percentage of Medical Consultation within the Interviewed Population by Education Level

### 3.2.2.7 Medical Consultation According to Socioeconomic Status

Individuals with a higher socioeconomic status consult doctors much more frequently (90%) due to the higher costs associated with medical services (Figure 14).

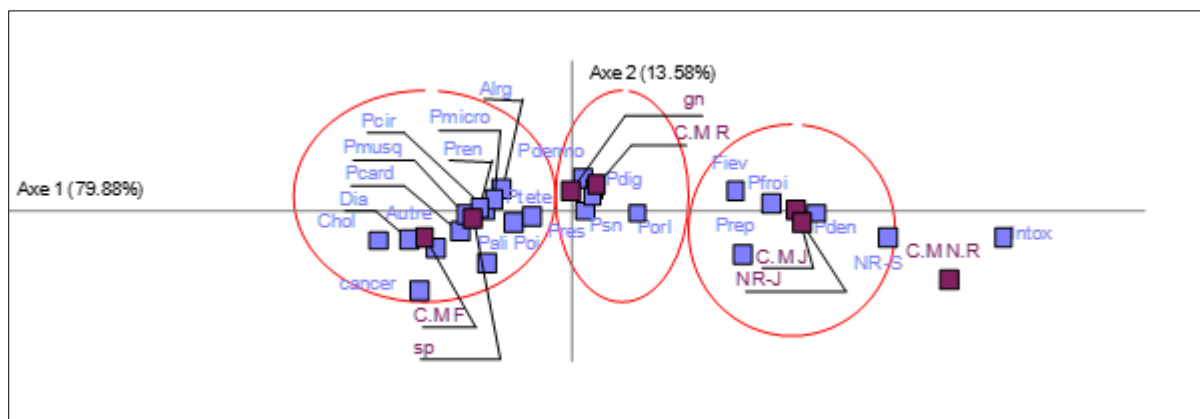


C.M (Medical Consultation within the Interviewed Population), F (Frequently), R (Rarely), N.S.E (Socioeconomic Level), B (Low), E (High), M (Medium). The dependency is highly significant. The cells highlighted in blue (pink) are those for which the actual count is significantly higher (lower) than the expected count. The chi-squared test is calculated on the table of citations (marginal counts equal to the sum of row/column counts). The table values are row percentages based on 3013 citations.

Figure 14. Number and Percentage of Medical Consultation within the Interviewed Population by Socioeconomic Level

### 3.2.2.7 Distribution of Diseases and Medical Consultation

Data analysis using PCA indicates that individuals with chronic conditions such as diabetes, cholesterol issues, cardiovascular problems, kidney issues, and bone and joint problems consult specialist doctors more frequently. Patients with digestive, dermal, respiratory, ear, and nervous system problems tend to consult general practitioners less frequently. Additionally, individuals experiencing common ailments such as cold, fever, dental issues, and reproductive system problems show a low tendency to consult doctors (Figure 15).



**Figure 15.** The distribution of diseases and therapeutic purposes according to the Medical Consultation (CM: Medical Consultation, F: frequently, R: rarely, J: never, NR: unanswered, gn: general doctor, sp: specialist doctor)

### 3.2.3. Massages and "Jbira" (Traditional Splinting Method)

In cases of sprains, bone fractures, persistent muscle pain, joint problems, unexplained headaches, and migraines, the population turns to practitioners who use massages or the "Jbira" method. The "Jbira" technique involves immobilizing the affected area using reed sticks and bandages dipped in a mixture of egg white and flour. This immobilization is believed to help stabilize the injured or painful area, promoting healing and reducing discomfort. It is commonly used for sprains, fractures, joint problems, and muscle pain. Additionally, massages are an integral part of traditional healing methods in Morocco. Local healers and practitioners use various massage techniques to alleviate pain, improve blood circulation, and relax muscles. These massages may involve the use of herbal oils, such as olive oil, which are believed to have therapeutic properties.

### 3.2.3 Medication with Mineral Water from Springs

Mineral water springs are often located in areas with unique geological formations that impart specific mineral compositions to the water. Different springs are believed to have different therapeutic properties, and local communities have developed a rich knowledge of the medicinal qualities associated with each source (Smith *et al.*, 2019).

Traditionally, people seeking therapeutic benefits from these mineral water springs would undertake "cures" or "baths" by immersing themselves in the water or consuming it directly. The duration and frequency of these treatments vary depending on the condition being treated and the recommendations of local healers or practitioners (Jones *et al.*, 2020).

In Oriental Morocco, in the case of certain diseases such as kidney disorders, skin conditions, and eye problems, patients often seek treatment near mineral water springs known for their therapeutic properties, such as the **Sidi Chafi**, **Fazouan springs** and **hammam benkachour**. These mineral

water sources are believed to have healing properties and are used by patients for their potential benefits in managing specific health conditions.

Some of the popular mineral water springs used for medication in Oriental Morocco includes:

- ***Sidi Chafi Spring***: Located near *Taourirt*, the *Sidi Chafi* spring is renowned for its supposed healing properties for various conditions, particularly skin disorders and digestive issues.
- ***Fazouan Spring***: Located near the city of *Berkane*, the *Fazouan spring* is reputed for its mineral-rich waters, which are believed to be beneficial for kidney, urinary tract problems and eye problems and vision.
- ***Hamman Benkachour Springs***: Located close to the city of *Oujda*, the *Hamman Benkachour Springs* are known for their warm and sulfur-rich waters, which are used for the treatment of rheumatism, musculoskeletal conditions and skin conditions.

### 3.2.4 Consultations with *Fkihs* or *Talebs*

*Fkihs* and *Talebs* are learned individuals who derive their authority from their knowledge of the Quran and the sacred value attributed to this holy book. Their therapeutic or prophylactic practice primarily involves reciting verses from the *Quran* and providing amulets containing a written verse on a piece of paper. However, their practice can extend to conducting trance sessions and even exorcisms.

### 3.2.6 Pilgrimages to Holy Sites

In cases where the illness persists despite the use of medications, medicinal plants, and consultations with '*fkihs*' (Islamic scholars), especially when the etiology of the disease is not organ-related, such as mental or psychological conditions, the patient turns to holy sites. These sites can be *Zawiyas* or *Marabouts*, often serving as places of spiritual healing and seeking divine intervention.

### 3.2.7 Cupping Therapy '*l-hijama*'

Cupping therapy, or '*l-hijama*', is a traditional healing practice that has been passed down through generations in Islamic and Arab cultures. It is based on the belief that the body can benefit from the removal of stagnant or toxic blood through the use of specialized cups that create suction on the skin (Smith *et al.*, 2019). During a cupping session, cups made of glass, plastic, or bamboo are placed on the skin's surface after creating a vacuum. This vacuum causes the skin to rise and redden as blood vessels expand. The cups are left in place for a few minutes, and then they are removed, creating small, circular bruises on the skin.

Cupping therapy is believed to have various health benefits, such as improving blood circulation, reducing inflammation, relieving pain, and promoting relaxation. It is often used to treat musculoskeletal conditions, such as back pain, neck pain, and joint pain, as well as respiratory disorders like asthma and bronchitis.

### 3.2.7 Witchcraft

Consultations with seers-healers, mostly women, are common. Their role is multifaceted, including therapeutic and divinatory aspects. Although the society is Muslim, strong practices of witchcraft still persist, particularly in diagnostic and therapeutic endeavors, especially for illnesses believed to be caused by "*djins*" or malevolent forces, such as mental disorders and sexual problems. In theory, it is forbidden for Muslims to seek the services of therapists practicing witchcraft. These practitioners may utter "pagan" words during the preparation of their remedies.

Individuals' daily behaviors when confronted with health issues, both for themselves and their loved ones, vary depending on the illness, its cause, its severity, or even the perceived effectiveness of the initial therapeutic method sought. For example, a Muslim father aged over 60, who has never consulted an herbalist, may turn to a sorcerer if his grandchild is diagnosed with cancer.

## Conclusion

The therapeutic pluralism is clearly evident in this sample of the population in Oriental Morocco. However, the various traditional practices remain unregulated. Therefore, it is necessary to incorporate useful traditional medical practices in the provision of healthcare, especially at the primary healthcare level, by adopting a national list of effective and safe traditional therapeutic practices and formulating national policies regarding traditional medicine. Additionally, developing healthcare infrastructure tailored to the needs and beliefs of the concerned populations is essential.

**Conflict of Interest:** The authors declare that there are no conflicts of interest.

**Compliance with Ethical Standards:** This article does not contain any studies involving human or animal subjects.

**Funding:** This work did not receive any specific grant from funding agencies in the public, commercial, or not for-profit sectors.

**Declaration of Competing Interests:** The authors declare that they have no competing interests.

## References

- Alami Merrouni I., Elachouri M. (2023). NEMMAP Database: A platform for exploring the Ethnobotanical, Pharmacological, and Phytochemical profile of North-Eastern Morocco Medicinal plants, *J. Mater. Environ. Sci.*, 14(2), 153-160
- Bellakhdar J., (1997) La pharmacopée Marocaine Traditionnelle. Médecine Arabe ancienne et savoirs populaires, Ibis Press.
- Benarba B., Belabbes S., Djaziri R., (2018) Ethnobotanical study of medicinal plants used by traditional healers in Mascara (North West of Algeria). *Journal of Ethnopharmacology*, 209, 359-369.
- Eddouks M., Maghrani M., Lemhadri A., Ouahidi M.-L., Jouad H., (2002) Ethnopharmacological survey of medicinal plants used for the treatment of diabetes mellitus, hypertension and cardiac diseases in the south-east region of Morocco (Tafilalet). *Journal of Ethnopharmacology*.82, 97-103.
- El Beghdadi M., (1991) Pharmacopée traditionnelle du Maroc. Les plantes médicinales et les affections du système cardio-vasculaire.
- El-Hilaly J., Hmammouchi M., Lyoussi B. (2003) Ethnobotanical studies and economic evaluation of medicinal plant in Taounate province (Northern Morocco). *Journal of Ethnopharmacology*. 86, 149-158.
- Elachouri, M., Kharchoufa, L., Fakchich, J., Lorigooini, Z., Subhasis, P., & Subhash, M. (2021). Ancestral phytotherapeutic practices in Morocco: regards on history, current state, regulatory and safety of commonly used herbal medicine. *Arabian Journal of Chemical and Environmental Research*, 8(1), 133-149.
- El Haouari M., El Makaoui S., Jnah M., Haddaouy A. (2018), A survey of medicinal plants used by herbalists in Taza (Northern Morocco) to manage various ailments, *J. Mater. Environ. Sci.* 9 (6), 1875-1888
- El Ouariachi E.M., Paolini J., Bouyanzer A., Tomi P., Hammouti B., Salghi R., Majidi L., Costa J. (2011), Chemical composition and antioxidant activity of essential oils and solvent extracts of *Thymus capitatus* from Morocco, *Journal of Medicinal Plants Research*, 5(24), 5773-5778.
- El Yahyaoui El Idrissi A., Talbaoui A., Bouyahya A., Khouchlaa A., Bakri Y., Tijane M. (2018), Ethnobotanical study on the Bereztem Plant (*Aristolochia longa*) used in the treatment of some diseases in the cities of Rabat, Sale and Temara (Morocco), *J. Mater. Environ. Sci.* 9 (6), 1915-1921

- Fakchich, J., Kharchoufa, L., Bencheikh, N., Zerkani, H., Ouassou, H., Bouhrim, M., ... & Elachouri, M. (2022). Assessment of Indigenous Plants Knowledge among Traditional Healers in Eastern Morocco: Quali-Quantitative Approach (Part I). *Applied Sciences*, 12(24), 12773.
- Fakchich J., & Elachouri M. (2021). An overview on ethnobotanico-pharmacological studies carried out in Morocco, from 1991 to 2015: Systematic review (part 1). *Journal of Ethnopharmacology*, 267, 113200.
- Jamila F., & Mostafa, E. (2014). Ethnobotanical survey of medicinal plants used by people in Oriental Morocco to manage various ailments. *Journal of ethnopharmacology*, 154(1), 76-87.
- Hamdani S.E., (1984) Médecine traditionnelle a` Boujaad. Thèse de Pharmacie. Fac. Méd. Pharm. Rabat.
- Hmammouchi M., (1999) Les plantes médicinales et aromatiques marocaines. Utilisations, biologie, écologie, chimie, pharmacologie, toxicologie et lexiques. Imprimerie Fédala. Rabat-Instituts. 450 p.
- Jahandiez E., Maire R., (1931/1934) Catalogue des plantes du Maroc. 3 vols. Minera, Le Chevalier ; Alger.
- Jaouad L., (1992) Enquête ethnobotanique : La part de la médecine traditionnelle dans les différentes couches socio-économiques de la population de Casablanca. Thèse de Pharmacie. Fac. Méd. Pharm. Rabat
- Jouad H., Haloui M., Rhiouani H., El Hilaly J., Eddouks M., (2001) Ethnobotanical survey of medicinal plants used for the treatment of diabetes, cardiac and renal diseases in the North centre region of Morocco (Fez-Boulemane). *Journal of Ethnopharmacology*, 77, 175-182
- Lahlou S., (2013) Traditional Medicine in Morocco: Between Myth and Reality. *European Journal of Integrative Medicine*, 5(6), 553-564.
- Loukili EH., Bouchal B., Bouhrim M., Abrigach F., Genva M., Zidi K., Bnouham M., Bellaoui M., Hammouti B., Addi M., Ramdani M. and Fauconnier M-L. (2022) Chemical Composition, Antibacterial, Antifungal and Antidiabetic Activities of Ethanolic Extracts of *Opuntia dillenii* Fruits Collected from Morocco, *Journal of Food Quality*, 2022, 1-15
- Maire R., 1952/1980. Flore de l'Afrique du Nord, vol. 15. Le Chevalier, Paris
- Nabih M. Secrets et vertus thérapeutiques des plantes médicinales utilisées en médecine traditionnelle dans la province de Settat. 1992 ; Thèse de Pharmacie. Fac. Med. Pharm. Rabat.
- Negre R., (1961) Petite flore des régions arides du Maroc occidental, vol. 2. CNRS, Paris.
- Ozenda P., (1997) Flore du Sahara (Deuxième édition revue et complétée). CNRS, Paris.
- Rhalem N., Soulaymani A., Soulaymani-Bencheikh R., (2016) Pluralistic health care systems in Maghreb countries. *The International Journal of Health Planning and Management*, 31(4), 247-260.
- Sekkat C., (1987) Le diabète et la phytothérapie. Enquête auprès de 100 D.I.D. et 100 D.N.I.D. Thèse de Pharmacie. Fac. Med. Pharm. Rabat.
- Tahraoui A., El-Hilaly J., Israili Z.H., Lyoussi B., (2006) Ethnopharmacological survey of plants used in the traditional treatment of hypertension and diabetes in south-eastern Morocco (Errachidia province). *Journal of Ethnopharmacology* 77, 175-182.
- Ziyyat A., Legssyer A., Mekhfi H., Dassouli A., Serhrouchni M., Benjelloun W., (1997) Phytotherapy of hypertension and diabetes in oriental Morocco. *Journal of Ethnopharmacology* 58, 45-54.

---

(2023) ; <http://www.jmaterenvirosci.com>