

Ethnobotany Study of Medicinal Plants Used in the Treatment of Respiratory Diseases in the Middle Region of Oum Rbai

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Abstract— The ethnobotanical study carried out in the region of Oum Rbia (Morocco) made it possible to identify the medicinal plants used by the local population and to collect the maximum information on this use.

A survey of 1360 people from the region's population noted that 170 people use medicinal plants against respiratory diseases. Women accounted for 55.3% of the workforce versus 44.7% for men; Married people 70% against 28% for singles. The illiteracy rate is high (34.1%).

The leaves are the most widely used part of the plant. Infusion and decoction are the most commonly used methods for preparing traditional remedies.

The most widely used species in the treatment of respiratory diseases are: *Origanum glandulosum*, *Eucalyptus globulus*, *Nigella sativa*, *Mentha pulegium*, *Lavandula stoechas*, *Zingiber officinale*, *Ammodaucus leucotrichus*, *Ficus carica*. In addition, some species have toxicity either because of the ignorance of the necessary dose or because the people treated are affected by other diseases.

Thus, the survey made it possible to inventory 66 medicinal species which are divided into 36 plant families; *Lamiaceae* (21.2%), *Myrtaceae* (10.6%), *Apiaceae* (8.8%), *Amaryllidaceae* (7.7%) and *Zingiberaceae* (7.1%).

These results resulted in a catalog of medicinal plants used in the study area to treat respiratory diseases. It is a local know-how that must be considered as a heritage to be preserved and developed.

Keywords— Oum Rbia, Ethnobotany survey, respiratory diseases and medicinal plant.

I. INTRODUCTION

The respiratory system (nasal passages, bronchi and lungs) can be the subject of several diseases: acute infections such as pneumonia and bronchitis, or chronic conditions such as asthma and COPD. Thus, respiratory

diseases, regardless of the age of the patients, represent approximately 5.5 million medical consultations per year (Ministry of Public Health, 2001). In the majority of cases (85%), these patients have acute respiratory diseases, mainly angina or acute bronchitis. The remaining cases (15%), have a chronic respiratory disease or a suspicion of pulmonary tuberculosis (Ministry of Public Health, 2001). Among chronic respiratory diseases, asthma occupies the first place and pulmonary tuberculosis accounts for only 4 to 5% of cases (Ministry of Public Health, 2001).

The World Health Organization estimates that traditional medicine covers the primary health care needs of 80% of the population in developing countries (Vines, 2004). Plants still play a very important role in the medical traditions and life of the inhabitants of the Maghreb, but the rules of their use sometimes lack rigor and do not take into account the new demands of modern therapy (Bellakhdar, 2006).

Morocco, whose geographical location has a flora rich in diversity, has about 4200 species of which only a hundred are currently exploited according to El Meskaoui (2008).

In order to preserve the natural heritage of the Middle Oum Rbai region, we carried out an ethnobotanical study collecting the knowledge, attitudes and practices of the local population concerning all the plants used in the Treatment of respiratory diseases.

II. MATERIAL AND METHOD

1. The study area:

Oum Rbia means the provinces of Khouribga, Fkih Ben Saleh and Kasbat Tadla. It is linked to the Beni Mellal-Khénifra region following the territorial division of 2015 (Fig. 1).

The Beni Mellal-Khénifra region is limited to the west by the regions of Casablanca Settat and Marrakech-Safi, to the south by the Draa Tafilalet region, to the east by the

eastern region and to the north by the regions of Fez

Meknes and Rabat Sale Kenitra.

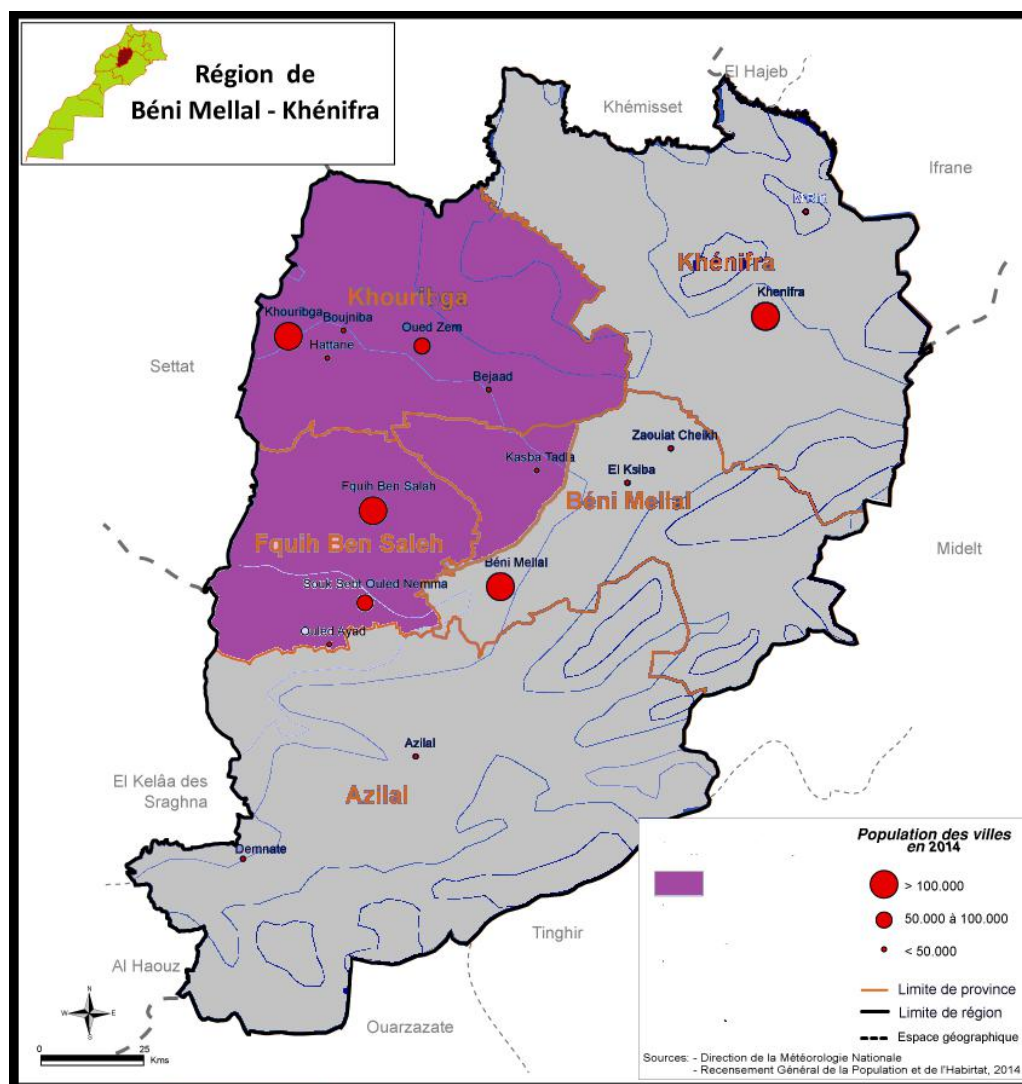


Fig.1: Map of the study area (General Monograph of the Beni Mellal-Khénifra Region, 2015)

2. The methodology:

An ethnobotanical survey was conducted in the Oum Rbia region between 2010 and 2015 and was based on stratified random sampling; A pre-established questionnaire based on information on the profile of the informant (Age, intellectual level, family situation ...) and on the other hand on the use of plants in traditional medicine (vernacular name of the plant, part used, dose used, method of preparation, disease treated, etc.). Plants are collected in the wild or obtained in traditional healers. The local name of the plant is given by the interviewees or by the traditional healers and the scientific name is determined in the laboratory. Determination of species was carried out thanks to the New flora of Algeria and the southern desert regions Quézel & Santana (1962, 1963), volumes I and II; The Practical Flora of Morocco Fennane et al. (1999, 2007), Volume 1 and 2; Catalog of vascular plants in Northern Morocco, including identification keys,

by Valdés et al (2002), volumes I and II; And the Vascular Flora of Morocco: inventory and chorology Fennane and Ibn Tattou (2005). Books such as: Medicinal plants of Morocco Sijelmassi (1993); The traditional Moroccan pharmacopoeia Bellakhdar (1997); And Moroccan medicinal and aromatic plants Hmamouchi (2001) have also been used for the recognition of medicinal plants.

III. RESULTS

The survey of 1360 people in the study area identified 170 people who use herbal medicines against respiratory diseases.

➤ The use of medicinal plants according to the survey:

The calculations of the following proportions are made on the basis of the number of people who use medicinal plants against the ailments of 170 people.

1) **The informant by sex:** The analysis of Figure 2 shows that women predominate in the use of medicinal plants in herbal medicine for respiratory diseases with 55% compared with 45% for men.

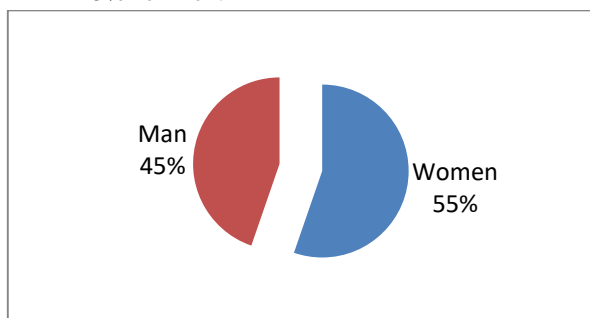


Fig.2: Use of Medicinal Plants by Sex in the Oum Rbai Region

2) **The informant according to age:** Analysis of the results obtained shows that 54% of the respondents belong to the age group] 30-50], 21% are over 50 years old, 18% are part of the age group] 20-30] and 7% are aged less than 20 years (Figure 3).

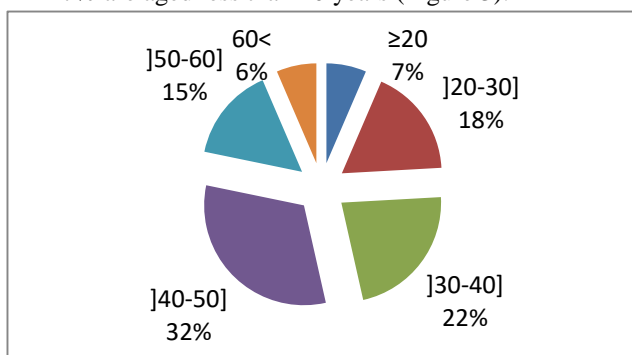


Fig.3: Use of Medicinal Plants by Age in the Oum Rbai Region

3) **The informant according to the intellectual level:** the results show that the illiterate persons represent 34% of the workforce, followed by secondary education with 27%, primary school with 17%,

while the college level has 12 % And academics 10%.

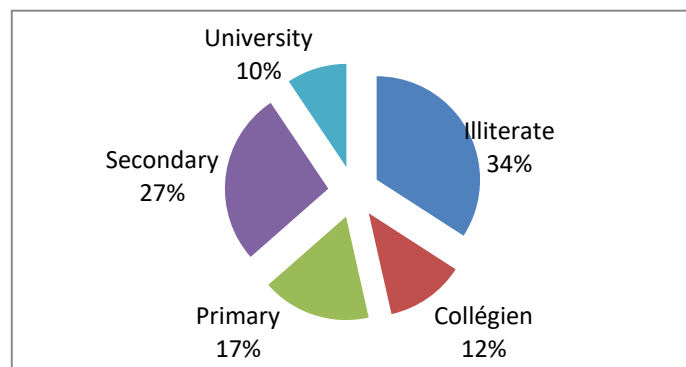


Fig.4: Use of Medicinal Plants by Study Level in the Oum Rbai Region

4) **Profile of the informant according to the family situation:** married people predominate with 70%, against married couples who represent 28% and widowers 2% (Figure 4).

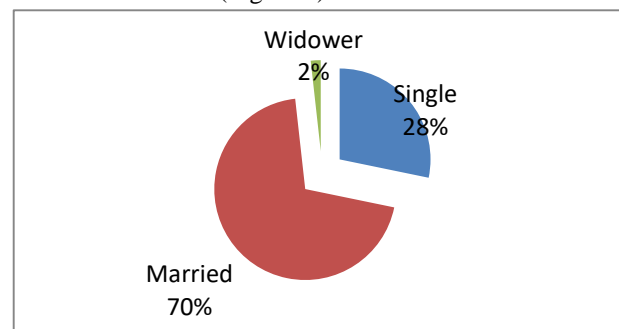


Fig.5: Use of Medicinal Plants by Family Status in the Oum Rbai Region

➤ **The use of medicinal plants according to the part used:** Phytotherapy for the treatment of respiratory disorders is based first on the leaves (70 citations), then on the seed (34 citations), and finally on the rhizome and the whole plant with 18 citations for each of the two categories. For other parts of the plant, the number of citations is much lower (Figure 6).

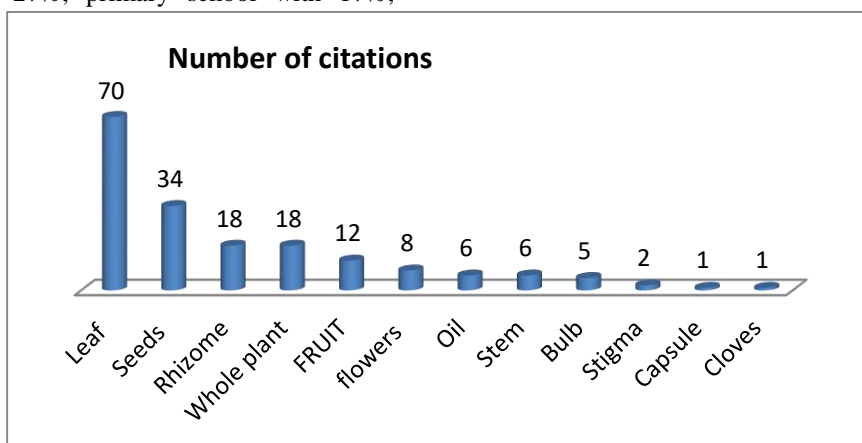


Fig.6: Plant parts used in herbal medicine in the Oum Rbai Region

- **The Flora analysis:** The floristic analysis shows that *Origanum glandulosum* is the most used species against respiratory diseases in the region of Oum Rbai followed by *Eucalyptus globulus*, *Nigella sativa*, *Mentha pulegium*, *Lavandula stoechas*, *Zingiber officinale*, *Ammodaucus leucotrinarum* and *Ficus carica* (figure7).

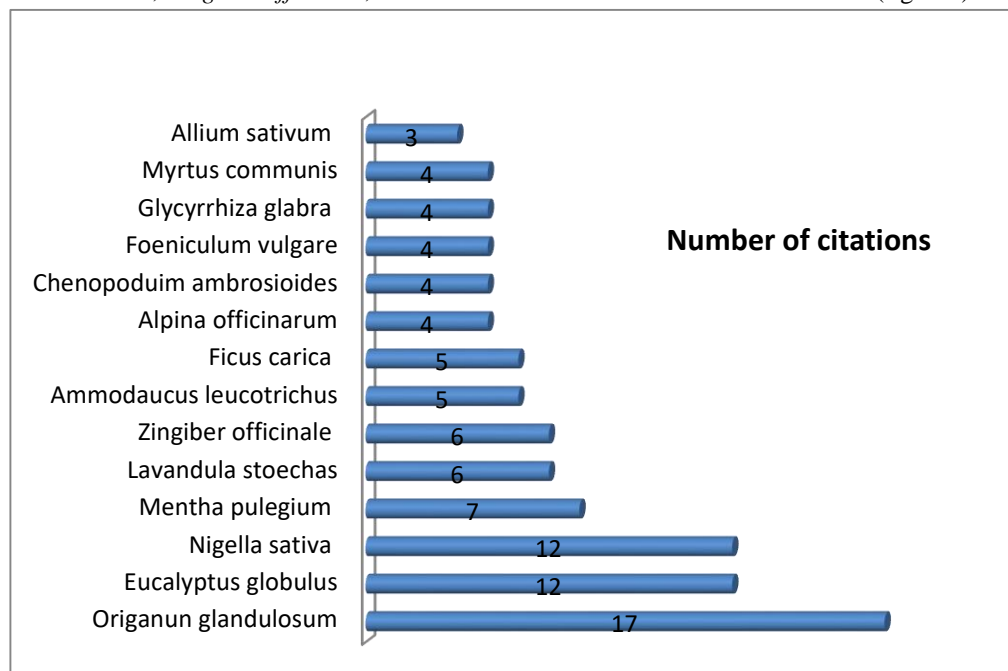


Fig.7: Medicinal plants most commonly used to treat respiratory diseases in the Oum Rbai region

The analysis of the results also shows that the Lamiaceae family is dominant with 21.2% of the resected species, Myrtaceae in second class with 10.6%, Apiaceae with 8.8%, Amaryllidaceae and Zingiberaceae with 7.1% each.

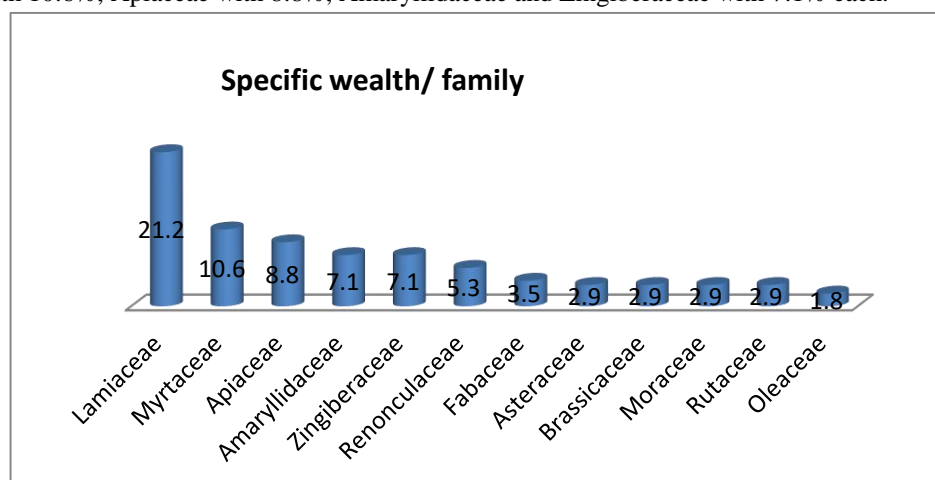


Fig.8: Specific Wealth of Families Represented to Treat Respiratory Diseases in the Oum Rbai Region

- **Respiratory diseases most frequently treated by plants:** According to the results obtained, respiratory diseases most frequently treated by medicinal plants in the region of Oum Rbia are: influenza first with 47 citations, cooling with 44 citations, 39 citations concern respiratory diseases in general. Because the inquiry does not specify the exact disease, but it uses the plant for all that concerns the respiratory apparatus, the cough (19 citations).

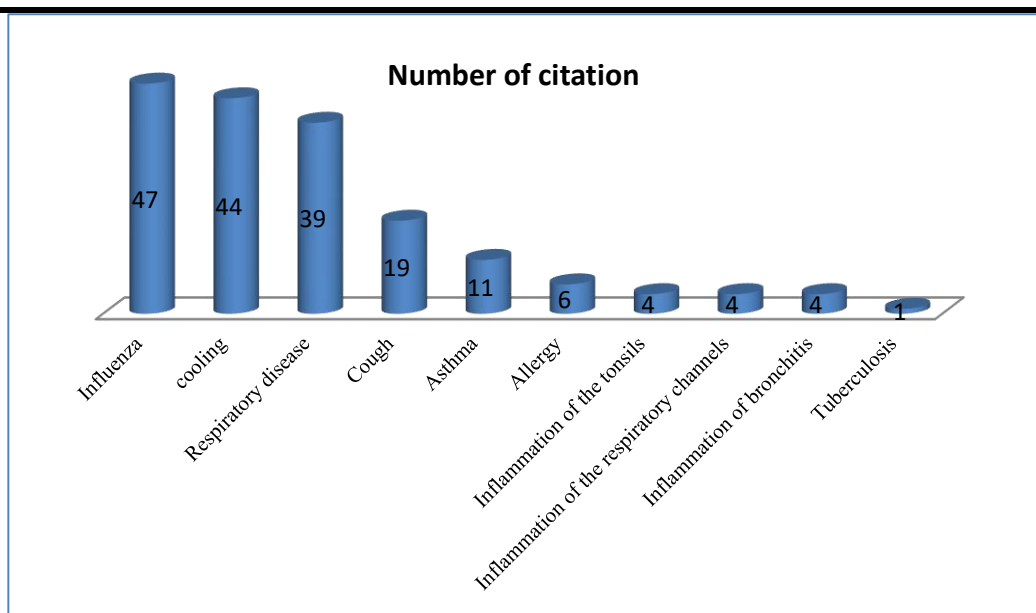


Fig.9: Respiratory diseases treated by plants in the Oum Rbai region

IV. DISCUSSION

Analysis of the results obtained from 170 people using medicinal plants against respiratory diseases shows that women predominate for the use of medicinal plants with 55% against 45% for men. These results are consistent with those obtained by Hmamouchi (1999), Mehdioui (2008) and El Hilah (2015). 54% of respondents belong to the age group] 30-50], 21% are older than 50 years, 18% are in the age group] 20-30] and 7% are less than 20 years. This can be explained by the company's return to the use of traditional herbal medicine with a good transmission of the popular knowledge of the elderly towards the young (Hseini, 2008). Illiterates represent 34% of the workforce, followed by secondary schooling with 27%, primary education 17%, college 12% and university 10%. A renewed interest in medicinal plants is noticed; People are beginning to become aware of the side effects of pharmaceutical treatments based on chemical molecules. The married population predominates with 70%, against the singles who represent 28% and the widowed 2%. These results are related to the responsibility of brides towards the needs of the family. This is consistent with the results obtained by other studies at the national level (Hseini, 2008, Benkhniq, 2010, El Hilah, 2015 ...). Phytotherapy for the treatment of respiratory diseases relies primarily on the leaves, seed, rhizome and whole plant, for the other parts of the plant the number of citations is much lower.

Plant analysis shows that *Origanum glandulosum* is the most widely used species against respiratory diseases in the Oum Rbai region followed by *Eucalyptus globulus*, *Nigella sativa*, *Mentha pulegium*, *Lavandula stoechas*, *Zingiber officinale*, *Ammodaucus leucotrinarum* and

Ficus carica. The most common families are Lamiaceae, Myrtaceae, Apiaceae, Amaryllidaceae and Zingiberaceae. Lamiaceae also rank first in the study carried out in the Central Plateau of Morocco by El Hilah in 2016.

The respiratory diseases most frequently treated by medicinal plants in the region of Oum Rbia are flu, cooling, coughing. As for asthma, allergy and more serious lung diseases, the population uses less herbal medicine.

V. CONCLUSION

Surveys of 1360 people in the region have identified 170 people who use herbal medicines against respiratory diseases. The diseases most commonly used by herbal medicine are influenza, chills and coughs; People have less recourse to this mode of medication when conditions are more serious, such as asthma and tuberculosis. Thus, the survey made it possible to inventory 66 medicinal species which are divided into 36 plant families. . Women are predominant with 55.3% against 44.7% for men. Traditional medicine is more practiced by married people with 70% against 28% for singles. The illiteracy rate is high at 34.1%. As for the plant, the leaves are the most used part. Infusion and decoction are the means of preparing the most used remedies. The species most commonly used in the treatment of respiratory diseases are: *Origanum glandulosum*, *Eucalyptus globulus*, *Nigella sativa*, *Mentha pulegium*, *Lavandula stoechas*, *Zingiber officinale*, *Ammodaucus leucotrichus*, *Ficus carica*. In addition, some species have toxicity either because of the ignorance of the necessary dose or because some people have other diseases. The results show a relative importance of the following families: Lamiaceae (21.2%),

Myrtaceae (10.6%), Apiaceae (8.8%), Amaryllidaceae (7.7%) and Zingiberaceae (7.1%). These results resulted in a catalog of medicinal plants used in the region to treat

respiratory diseases. The catalog of 66 species testifies to a local know-how of great value, it is a heritage that must be preserved and managed in the sustainability.

Table.1: List of medicinal plants used in the treatment of respiratory diseases in the Middle Oum Rbia region

Family	Vernacular name	Scientific name	Used part	Preparation	Administration mode	Disease
Amaryllidaceae	Thoum	<i>Allium sativum</i>	Bulb	Decoction	Oral	Respiratory, cooling
	Lamkhenza	<i>Chenopodium ambrosioides</i>	Leaf	Infusion, Juice	Oral, fumigation, massage	Influenza, tonsillitis, respiratory
	Selk	<i>Beta vulgaris/serpetual spinach</i>	Leaf, whole plant	Decoction	Oral	Respiratory
	Sabra	<i>Agave americana</i>	Leaf	Decoction	Oral	Asthma
	Pinard/sabanikh	<i>Spinacia olearea</i>	Leaf	Decoction	Oral	Respiratory
	Basla hamra	<i>Allium cepa</i>	Seed	Powder	Oral	Allergy
Apiaceae	Krafess	<i>Apium graveolens</i>	Leaf, oil	Infusion	Oral	Calming bronchitis
	Nafeaa/basbass	<i>Foeniculum vulgare</i>	Seed, oil	Decoction , powder	Oral, massage	Influenza in babies and allergy
	Camoun souffi	<i>Ammodaucus leucotrichus</i>	Seed	Infusion	Oral	Influenza, cough
	Kazbour Ibir	<i>Coriandrum sativum</i>	Whole plant, seed	Infusion	Oral, Rinsing	Inflammation of respiratory ducts, cold
	Habat hlawa	<i>Pinpinella anisum</i>	Seed	powder	Oral	Allergy
	Maadnouss	<i>Petroose linum sativum</i>	Aerial part	Decoction	Oral	Respiratory
	Camoun	<i>Cuminum cyminum</i>	Seed	tisane	Oral	Respiratory
Asphodelaceae	Sebbar	<i>Aloe socotrina l</i>	Leaf	Tisane	Oral	Influenza
	Blalouz/ joudour barwk	<i>Asphodelus microcarpus</i>	Rhizome	Powder	Goute	Asthma
Asteraceae	Taskra	<i>Echinops spinosus</i>	Stem	Decoction	Oral	cooling
	Buagad /hindiba barri	<i>Cichorium intybus</i>	Leaf	Infusion	Oral	Respiratory
	Tarhella/oum karman	<i>Inula helenium</i>	Leaf, flowers, rhizome	Infusion	Oral	cough
	Chih	<i>Artemisia herba-alba asso</i>	Leaf	Infusion	Oral	Respiratory
Berberidaceae	Bosman	<i>Berberis vulgaris</i>	Fruit, stem bark	Decoction	Oral	Bronchial Inflammation

<i>Borraginaceae</i>	Lessan laard	<i>Borrigo officinalis</i>	Leaf, Seed	Infusion	Oral	Cough, Influenza
<i>Brassicaceae</i>	Hab rchad	<i>Lipiduum sativum</i>	Seed	Powder	Oral	Tonsillitis, Influenza
	Fijl elhessan	<i>Armoracia rusticana</i>	Rhizome	crude	Oral	Influenza
<i>Cactaceae</i>	Karmouss hindi	<i>Opuntia ficus indica</i>	Flowers	Infusion	Oral	Cooling
<i>Caprifoliaceae</i>	Borwabez	<i>Sambucus canadensis</i>	Leaf, Flowers	Infusion	Rinsing	Bronchial Inflammation
<i>Caryophyllaceae</i>	Wijan/bilsan	<i>Sambucus nigra</i>	Whole plant	Decoction	Oral, Rinsing	Respiratory
<i>Champignons</i>	Terfass	<i>Terfezia leonis</i>	Bulb	Decoction	Oral	Cooling
<i>Colchicaceae</i>	Temrat legrab/lessan jmel	<i>Androcymbium gramineum</i>	Leaf	Infusion	Rinsing	Bronchial Inflammation
<i>Euphorbiaceae</i>	Takaout	<i>Euphorbia resinifera</i>	Leaf	Powder	Oral	Asthma, Influenza, cough
<i>Fabaceae</i>	Kharoub timarin hindi	<i>Ceratonia siliqua</i>	Seed	juice	Oral	Asthma, cough
	Arkssouss	<i>Glycyrrhiza glabra</i>	Rhizome	Powder	Oral	cooling
<i>Gentianaceae</i>	Tamrat alakrab/hchechat laakreb	<i>Centaurium spicatum</i>	Whole plant	Decoction	Oral	Inflammation of respiratory tract
<i>Hydrangeaceae</i>	Taililote/taylulut	<i>Capparis spinosa</i>	Seed	Cooked	Oral	Cooling
<i>Illiciaceae</i>	Badyana	<i>Illicium verum</i>	Capsule	crude	Oral	Allergie
<i>Iridaceae</i>	Zaafran	<i>Crocus sativus</i>	Stigma	Decoction	Oral	Cooling, Respiratory
<i>Juncaceae</i>	Smar	<i>Juncus maritimus</i>	Seed, rhizome	Powder	Oral	Asthma
<i>Lamiaceae</i>	Zaatar	<i>Origanum glandulosum</i>	Leaf	Infusion	Oral	Influenza, Cooling
	El khouzama/halhal	<i>Lavandula stoechas</i>	Leaf	Infusion	Oral	Cooling, Influenza, allergy, cough
	Flio	<i>Mentha pulegium</i>	Leaf	Infusion	Oral	Cooling
	Miriwt	<i>Marrubium vulgrave</i>	Leaf	Infusion	Oral	Cooling
	Jaaidiya	<i>Teucrium fruticans</i>	Aerial part	Infusion	Oral	Influenza
	Merdedouch	<i>Origanum majorana</i>	Whole plant	Infusion	Oral	Cooling
<i>Liliaceae</i>	Korrat	<i>Allium porrum</i>	Bulb	Decoction	Oral	Asthma in children
<i>Malvaceae</i>	Khebiza	<i>Malva sylvestris</i>	Leaf	Decoction	Oral	cough
<i>Moraceae</i>	Karmouss	<i>Ficus carica</i>	Fruit	Decoction	Oral	Respiratory

<i>Myristicaceae</i>	Elgouza sahraouiya	<i>Myristica fragrans</i>	Seed	Powder	Oral	Influenza
<i>Myrtaceae</i>	Caliptus	<i>Eucalyptus globulus</i>	Leaf	Infusion, Decoction	Oral, fumigation	Influenza, cooling
	Krenfel	<i>Eugenia caryophyllata</i>	Cloves	Infusion	Oral	Antiseptic Respiratory
	Rayhan	<i>Myrtus communis</i>	Leaf	Infusion	Oral	Cooling, cough, Influenza
<i>Oleaceae</i>	Zaytoun	<i>Olea europaea</i>	Huile	Tisane	Oral, massage	Influenza, cough
<i>Papilionaceae</i>	Lhalba	<i>Trigonella foenum graecum</i>	Seed	Crude, tisane	Oral	Respiratory
<i>Pinaceae</i>	Tayda	<i>Pinus halepensis</i>	Leaf	Decoction	Oral	Respiratory
<i>Plantaginaceae</i>	Massassa	<i>Plantago major</i>	Leaf	Juice	Oral	Asthma, tuberculosis
	Zerketouna	<i>Plantago psyllium</i>	Whole plant	Infusion	Oral	Asthma
<i>Poaceae</i>	Lakbal/draa	<i>Zea mays</i>	Oil	Oil	Oral, massage	Asthma
<i>Portulagaceae</i>	Rejla	<i>Portulaca oleracea</i>	Aerial part	Decoction	Oral	Cooling
<i>Ranunculaceae</i>	Saneuj/haba sawda	<i>Nigella sativa</i>	Seed	Powder	Oral	Cooling , allergy, respiratory
<i>Rutaceae</i>	Fijl ajmal	<i>Ruta graveolens</i>	Leaf, Flowers	Juice	Oral	Inflammation of respiratory canals
	Lemon	<i>Citrus sinensis</i>	Fruit	Infusion	Oral	Influenza, tonsillitis
	Hamed	<i>Citrus limon</i>	Fruit	Juice	Oral	Respiratory
	Zanboua	<i>Citrus bigaradia</i>	Fruit	Juice	Oral	Cough
<i>Valerianaceae</i>	Sanbel	<i>Valeriana j atamansi</i>	Leaf	Powder	Oral	Asthma
<i>Verbinaceae</i>	Louiza	<i>Verbena officinalis</i>	Leaf	Infusion	Oral	Respiratory
<i>Violaceae</i>	Banafsaj	<i>Viola tricolor</i>	Leaf, Flowers	Infusion	Oral	Influenza
<i>Zingiberaceae</i>	Khedenjal	<i>Alpina officinarum</i>	Rhizome	Infusion	Oral	Cooling
	Skenjbir	<i>Zingiber officinale</i>	Rhizome	Infusion	Oral	Cough, Influenza

REFERENCES

- [1] El Meskaoui A., Bousta D., Dahchour A., Greche H., Harki A., Farah A., & Ennabili A., 2008. Plantes médicinales et aromatiques marocaines : opportunités et défis, Revue AFN Maroc.
- [2] Bellakhdar J., 2006. Plantes médicinales au Maghreb et soins de base. Précis de phytothérapie moderne. Editions Le Fennec, Casablanca.
- [3] Bellakhdar J., 1997 : La pharmacopée marocaine traditionnelle médecine arabe ancienne et savoirs populaires.
- [4] Benkhnig O., Zidane L., Fadli M., Elyacoub.H., Rochdi A., & Douira. A., 2010-2011. Etude ethnobotanique des plantes médicinales dans la région de Mechraâ Bel Ksiri (Région du Gharb du Maroc). Acta Bot. Barc. 53: 191-216 Barcelona, 2010-2011.
- [5] El Hilah F., Ben Akka F., Dahmani J., Belahbib N., Zidane L., Étude ethnobotanique des plantes médicinales utilisées dans le traitement des infections du système respiratoire dans le plateau central marocain, Journal of Animal & Plant Sciences, 2015. Vol.25
- [6] Fennane et al. 1999, 2007. Flore pratique du Maroc, Volume 1 et 2.
- [7] Fennane et Ibn Tattou. 2005. Flore vasculaire du Maroc : inventaire et chorologie (volume 1).
- [8] Hmamouchi M., 1999. Les plantes médicinales et aromatiques marocaines, utilisation, biologie, écologie, chimie, pharmacologie, toxicologie, lexiques. 387 p.
- [9] Hmamouchi M., 2001. Les plantes médicinales et aromatiques marocaines, 2ème édition;
- [10] Ministère de la Santé, Direction de l'Epidémiologie et de Lutte Contre les Maladies. 2001. Prise en charge combinée des maladies respiratoires et de la tuberculose au Maroc.
- [11] Monographie générale de la région Béni mellal-Khénifra. 2015
- [12] Hseini S., Kahouadji A., Lahsissène H. & Tijane M., 2011. Analyses floristique et ethnobotanique des plantes vasculaires médicinales utilisées dans la région de Rabat (Maroc occidental) — Lazaroa, 28, pp. 93-100.
- [13] Mehdioui R., Kahouadji A., 2007. Etude ethnobotanique auprès de la population riveraine de la forêt d'Amsittène : cas de la Commune d'Imin'Tlit (Province d'Essaouira). Bulletin de l'institut scientifique, rabat, section science de la vie, 29, 11-20.
- [14] Quézel & Santana 1962-1963. Nouvelle flore d'Algérie et des régions désertiques méridionales, tomes I et II.
- [15] Sijelmassi A., 1993. Les plantes médicinales du Maroc, 6ème édition. Le Fennec, Casablanca. 285p.
- [16] Valdés et al 2002. Catalogues des plantes vasculaires du Nord du Maroc, incluant des clés d'identification, de volumes I et II.
- [17] Vines G., 2004. Herbal harvests with a future: towards sustainable sources for medicinal plants, Plant life International; www.plantlife.org.uk