

# Medicinal plants adopted to treat children's diseases by traditional paediatrics "women healers" in the Souss Massa region (Agadir Idaoutanan, Inzegane Ait Meloul and Chtouka Ait Baha) Morocco

*Submission 10/08/2022, Publication date 31/12/2022, <http://m.elewa.org/Journals/about-japs/>*

## 1 SUMMARY

The population of southern Morocco, particularly of Souss Massa, use traditional empirical care. Several specialties of traditional medicine exist in the region including "women healers" considered traditional paediatricians, who use medicinal plants to treat diseases of infants and children. this study was carried out in order to collect information on the therapeutic practices and medicinal plants adopted and used by these "women healers" named locally by "ferraga" or "tachrift" and "tagouramt" in the Souss Massa region (Agadir Idaoutanan, Inzegane Ait Meloul and Chtouka Ait Baha), in order to preserve and protect this invaluable inheritance. Using questionnaires, a series of surveys were conducted during the years 2018-2019 and 2019-2020, among the population (sample of 279 people) to determine the importance of these "women healers" in the health sector of the region of these women healers. A survey was conducted among these "women healers" to collect the recipes adopted in the treatment of children's diseases. The population that uses traditional medicine frequently resorts to these "women healers" to treat digestive and respiratory diseases and the incessant crying. The population that uses traditional medicine resorts to these "women healers" to treat digestive (30% of population) and respiratory diseases and the incessant crying (24% of population). The floristic analysis of the adopted recipes has revealed 56 plant species divided into 35 botanical families. The most used families are Lamiaceae (12,5%) and Apiaceae (10,71%). the leaves constitute the part more used 32.26% followed by the seeds 22.58%, the infusion is the mode of preparation most used by 35% and the dose is generally by pinch, spoonful or by handful. These results show that the "women healers" have a very important place in the health service; especially they have a very interesting knowledge of the treatment of digestive and respiratory disorders. The plants identified in this study could constitute a database for further research in the field of phytochemistry and pharmacology.

## 2 INTRODUCTION

The World Health Organization considers traditional medicine as a set of medical practices, knowledge and beliefs based on the use of plants, animals or minerals as well as on psychotherapy and techniques applied for the diagnosis and treatment of disease (OMS, 2002). Because of the weakness of health services, the high cost of services in hospitals and the shortage of personnel, traditional medicine is becoming the main source of medical care for the African population including the Moroccan population. (Houngnihin, 2009). As Morocco has a rich medical tradition and know-how based on medicinal plants (Scherrer *et al.*, 2005), the population of southern Morocco, especially that of Souss Massa, resorts to rich empirical traditional care thanks to its confluent strategic location and also to the history of the region where various cultures (Amazigh, Jewish,

Saharan, and Arab) have coexisted. This heritage is the result of this mixture of ancestral know-how (Bellakhdar, 1997)&(El Rhaffari and Zaid, 2016). Several ethnobotanical studies have been carried out in the region but none has focused on women healers. These women have very interesting knowledge of therapeutic techniques based on medicinal plants. The objective of the survey is to gather more information on the different practices treatment and herbal medicines adopted and used by these women in the treatment of children's diseases. This study focused on these women healers, named locally according to the specialty "Ferraga" who mainly deal with women who have given birth, or "taguramt" and "tachrifit" specialized in the treatment of children's diseases. They are therefore considered as traditional paediatricians and gynaecologists.

## 3 MATERIALS AND METHODS

### 3.1 Description of the study area :

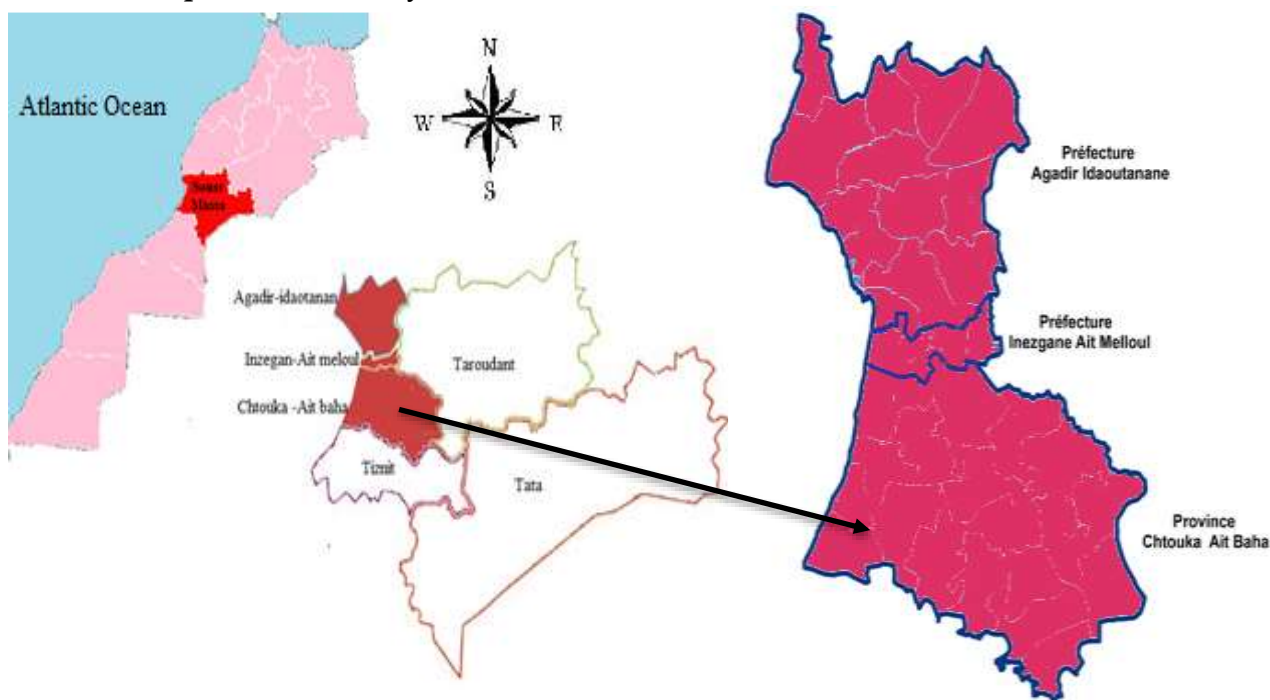


Figure 1: Map of the study area region Souss Massa

The region of Souss-Massa is divided into four provinces with two prefectures: Prefecture of

Agadir-Idaoutanane and Prefecture of Inezgane-Ait Melloul as well as the Province of Chtouka-

Ait Baha, Taroudant, Tata and that of Tiznit (figure 1). The number of municipalities is 175 including 21 urban and 154 rural, it covers an area of 53,789 km<sup>2</sup> limited to the north by the region of Marrakech-Safi and to the east by the

region of Drâa-Tafilalet, to the south. by the regions of Guelmim-Oued Noun and Lâayoune-Sakia el Hamra and in the West by the Atlantic Ocean (Monographie, 2019)

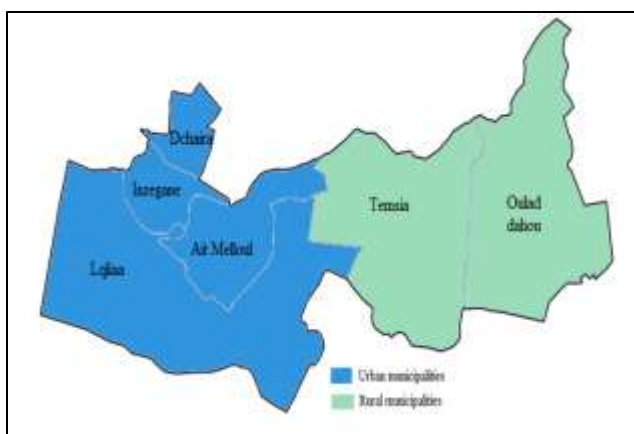


Figure 2: Map of prefecture Izegane-Ait Melloul



Figure 3: Map of prefecture Agadir-Idaoutanan

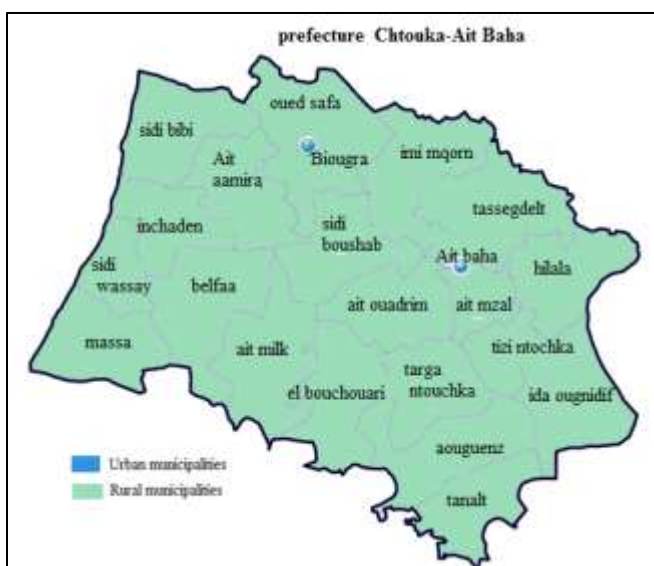


Figure 4: prefecture of Chtouka-Ait Baha

The region currently has nine hospitals (Table 1), basic health care training consists of 292 establishments, including 243 rural health centres and dispensaries and 49 others in urban areas. In addition to these structures, the region has a private sector made up of 23 clinics and 431 consultation offices. The public health

density in hospital beds is 1.630 inhabitants per bed, while public medical supervision is provided by 538 doctors: one doctor for 4.976 inhabitants (Monographie, 2019). However, the problem of inadequate health services persists (Table 1).

**Table1:** Distribution of public health establishments, by province and prefecture (Monographie, 2019)

| Provinces et<br>prefectures | General hospitals |            | Specialized hospitals |           | Total    |            |
|-----------------------------|-------------------|------------|-----------------------|-----------|----------|------------|
|                             | Number            | Beds       | Number                | Beds      | Number   | Beds       |
| Agadir- idaoutanan          | 1                 | 570        | 1                     | 40        | 2        | 610        |
| Inzegane-ait melloul        | 1                 | 310        | 0                     | 0         | 1        | 310        |
| Chtouka ait baha            | 1                 | 45         | 0                     | 0         | 1        | 45         |
| <b>Total</b>                | <b>3</b>          | <b>924</b> | <b>2</b>              | <b>40</b> | <b>4</b> | <b>965</b> |

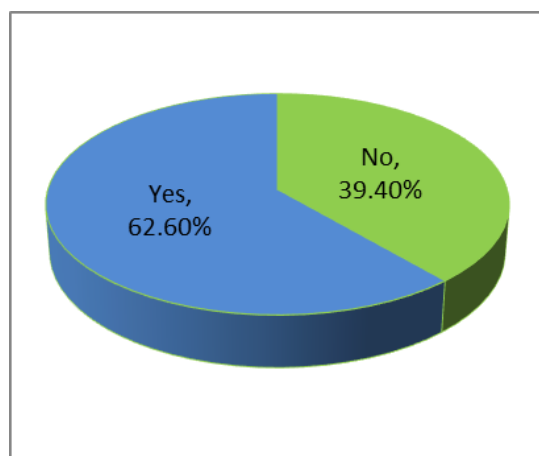
**3.2 Methods of data collection:** First, the study is carried out in the three provinces during 2018-2019 and 2019-2020, the surveys are conducted in the local population (278 questionnaires) to collect the information about traditional medicine: the various specialties, the positioning in the health field and the effectiveness. (Annex 2) Second, a descriptive cross-sectional study on treatment practices based on the use of medicinal plants by “women healers” was carried out by field survey in the different regions of Agadir, Inzane-ait Melloul, and Chtouka-Ait Baha (figure1, 2, 3 and 4). Given the clandestine nature in which these women exercise their healing practices, we used the technique of "open discussion" which consists of asking these healers for the diseases

treated and the medicinal plants used via free and open discussions. The number of healers questioned is 23 (average of 7 women per region). The identification of the plants mentioned by these women was carried out using regional, national and international ethnobotanical studies, the reference specimens of each plant were deposited in the herbarium of the laboratory of the research team in biotechnology and biomolecule engineering, Faculty of Science and Technology, University Abdelmalek Essaadi Tangier, Morocco. The data collected were recorded and analysed by IBM-SPSS statistics base 25 and the graphical representations are carried out by the same software.

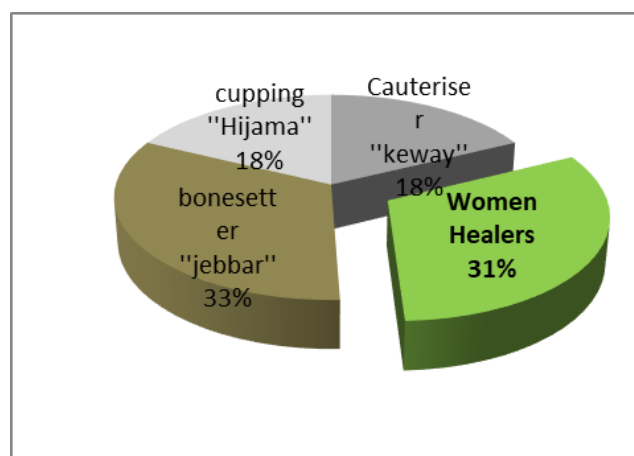
## 4 RESULTS

The investigation in the local population (279 people) showed that 62.60% have recourse to traditional medicine (figure 5) and “women

healers” are one of the most frequented with a percentage of 31 %.( Figure 6).



**Figure 5:** percentage of people how recourse to traditional medicine



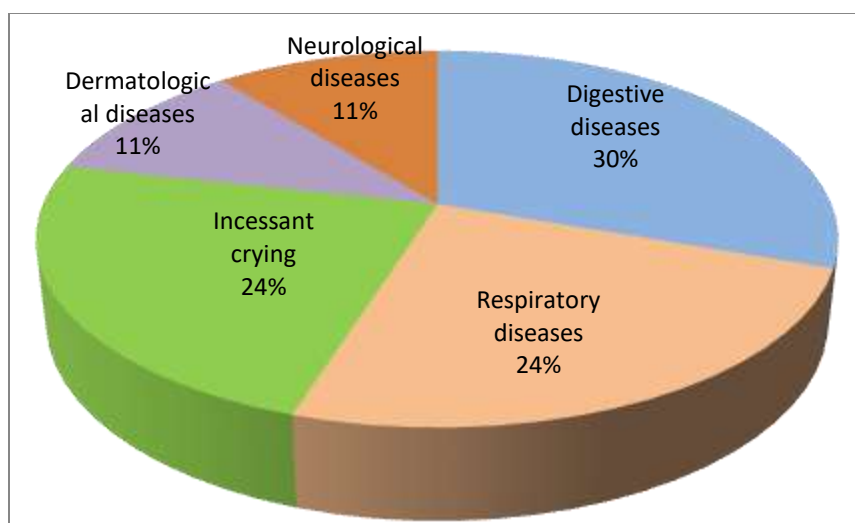
**Figure 6:** the percentage of specialties most frequented by the study population

The survey of “women healers” (23 women) revealed a number of children's diseases treated by these women (Table 2) whose most treated diseases are digestive diseases 26% respiratory

diseases and incessant crying 21% for each (figure 7), they mainly use medicinal plants to treat this diseases, we have identified 59 species divided into 34 botanical families (annexe 1).

**Table 2:** Children's diseases treated by women healers

| Digestive disorders                                              | Respiratory disorders | Incessant crying                                                    | dermatological disorders                                | Neurological disorders           |
|------------------------------------------------------------------|-----------------------|---------------------------------------------------------------------|---------------------------------------------------------|----------------------------------|
| Diarrhoea<br>Constipation<br>Bloated belly<br>Oxyurosis<br>Colic | Flu<br>Cold<br>Asthma | Effects attributed of Sorcery "chem" and "serra".<br>Severe Shaking | Buttons<br>Red plaques<br>Eczema<br>Skin burns<br>Wound | Epilepsy<br>Enuresis<br>Insomnia |



**Figure 7:** distribution of diseases treated by “women healers” in the sample of the population that had recourse to these women

**Medicinal plants and floristic analysis:** The most used families are Lamiaceae (12,5%), Apiaceae (10,71%) followed by Apocynaceae, Asteraceae and Fabaceae (5,36% for each) while

Compositae, Myrtaceae, Liliaceae and Rutaceae represent 3,57% for each, whereas the other families are the least used (1,72% for each) (figure 8).

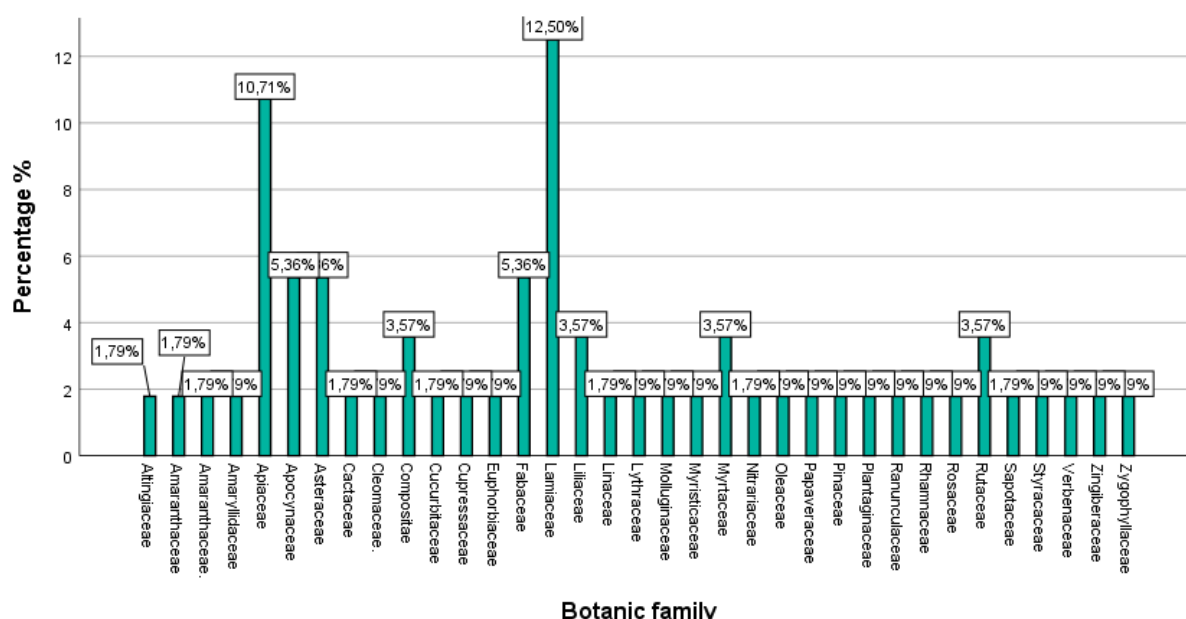


Figure 8: percentage of botanical families

**4.1 Digestive disorders:** From the recipes collected The species most adopted for the treatment of digestive disorders are *Matricaria chamomile* 22,72% , and *Foeniculum vulgare* L., *Pimpinella anisum* L. 18,18% followed by eight species (*Ammodaucus leucotrichus* L.; *Artemisia herba-alba*

*Asso* ; *Carvi carum* L. *Cuminum cyminum* L.; *Olea europaea* L. ; *Rosmarinus officinalis* L. *Thymus broussonetti* Boiss ; *Aloysia citriodora* Palau) with a percentage of 13,63% for each one, for the other species they are less adopted with a total percentage not exceeding 13% (Table 3).

Table 3: percentage of species adopted by “women healers” to treat digestive disorders

| Species                                                                                                                                                                                                                                               | Percentage use |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <i>Matricaria chamomile</i> L.                                                                                                                                                                                                                        | 22.72%         |
| <i>Foeniculum vulgare</i> L. ; <i>Pimpinella anisum</i> L.                                                                                                                                                                                            | 18.18%         |
| <i>Ammodaucus leucotrichus</i> L.; <i>Artemisia herba-alba</i> Asso ; <i>Carvi carum</i> L. <i>Cuminum cyminum</i> L.; <i>Olea europaea</i> L. ; <i>Rosmarinus officinalis</i> L. <i>Thymus broussonetti</i> Boiss ; <i>Aloysia citriodora</i> Palau  | 13.63%         |
| <i>Cassia senna</i> L. ; <i>Rosa damascena</i> L.                                                                                                                                                                                                     | 9.09%          |
| <i>Asphodelus tenuifolius</i> L.; <i>Corrigiola telephifolia</i> Pourr. ; <i>Linum usitatissimum</i> L.; <i>Allium sativum</i> L.; <i>Zizyphus lotus</i> L.; <i>Nigella sativa</i> L.; <i>Plantago ovata</i> Forssk. ; <i>Zygophyllum gaetulum</i> L. | 4.54%          |

**4.2 Respiratory disorders:** For children's respiratory disorders, it has been demonstrated that these “women healers” use frequently four

species, namely *Allium sativum* L., *Artemisia herba-alba* Asso; *Olea europaea* L. and *Thymus maroccanus* Ball 11,10% . (Table 4)

**Table 4:** percentage of species adopted by “women healers” to treat respiratory disorders

| Species                                                                                                                                                      | Percentage use |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <i>Allium sativum</i> L. ; <i>Artemisia herba-alba</i> Asso; <i>Olea europaeae</i> L., <i>Thymus maroccanus</i> Ball                                         | 110%           |
| <i>Eugenia caryophyllata</i> L.; <i>Glycyrrhiza glabra</i> L.; <i>Lepidium Sativum</i> L.; <i>Nigella sativa</i> L.; <i>Thymus broussonetti</i> Boiss.       | 7.40%          |
| <i>Boswellia frereana</i> Birdw.; <i>Chenopodium ambrosioides</i> L. ; <i>Foeniculum vulgare</i> L.; <i>Lavandula dentata</i> L. ; <i>Myrtus communis</i> L. | 3.70%          |

**4.3 Incessant crying:** Generally attributed to the effects of sorcery, these women frequently use two species *Corrigiola telephiifolia* Pourr. ; *Liquidambar orientalis* Mill. 12, 5% for each, while the other species together have a share of 12, 5 %.( Table 5)

**Table 5:** percentage of species used by “women healers” to treat incessant crying

| Species                                                                                                                                                                                       | Percentage use |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <i>Corrigiola telephiifolia</i> Pourr. ; <i>Liquidambar orientalis</i> Mill.                                                                                                                  | 12.5%          |
| <i>Nigella sativa</i> L.; <i>Peganum harmala</i> L.; <i>Ruta montana</i> L.; <i>Tetraclinis articulata</i> (Vahl) Mast.; <i>Trigonella foenum-graecum</i> L.; <i>Ziziphus lotus</i> (L.) Lam. | 8.3%           |
| <i>Cedrus atlantica</i> L.; <i>Ferula communis</i> L.; <i>Nerium oleander</i> L.; <i>Olea europaeae</i> L.; <i>Saussurea Costus</i> L.                                                        | 4.2%           |

**4.4 Dermatological disorders:** The recipes obtained show that *Allium cepa* L.; *Lawsonia Inermis* L.; *Olea europaeae* L. are the species prescribed (14.6%) twice as much as *Citrus limon* L.; *Colocytis vulgaris* L.; *Euphorbia officinarum* L.; *Opuntia ficus indica* (7.3%), while the overall percentage of use of the other species does not exceed 7.3%,(Table 6).

**Table 6:** percentage of species used by “women healers” to treat dermatological disorders

| Species                                                                                                                                                                                   | Percentage use |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <i>Allium cepa</i> L.; <i>Lawsonia Inermis</i> L.; <i>Olea europaeae</i> L.                                                                                                               | 14.60%         |
| <i>Citrus limon</i> L.; <i>Colocytis vulgaris</i> L.; <i>Euphorbia officinarum</i> L.; <i>Opuntia ficus indica</i> .                                                                      | 7.30%          |
| <i>Argania spinosa</i> L.; <i>Cedrus atlantica</i> L.; <i>Curcuma longa</i> L.;                                                                                                           | 4.90%          |
| <i>Asphodelus tenuifolius</i> Cav.; <i>Calotropis procera</i> (Aiton) Dryand. ; <i>Hammada scoparia</i> (Pomel) Iljin; <i>Nigella sativa</i> L.; <i>Zygophyllum gaetulum</i> Emb. & Maire | 2.40%          |

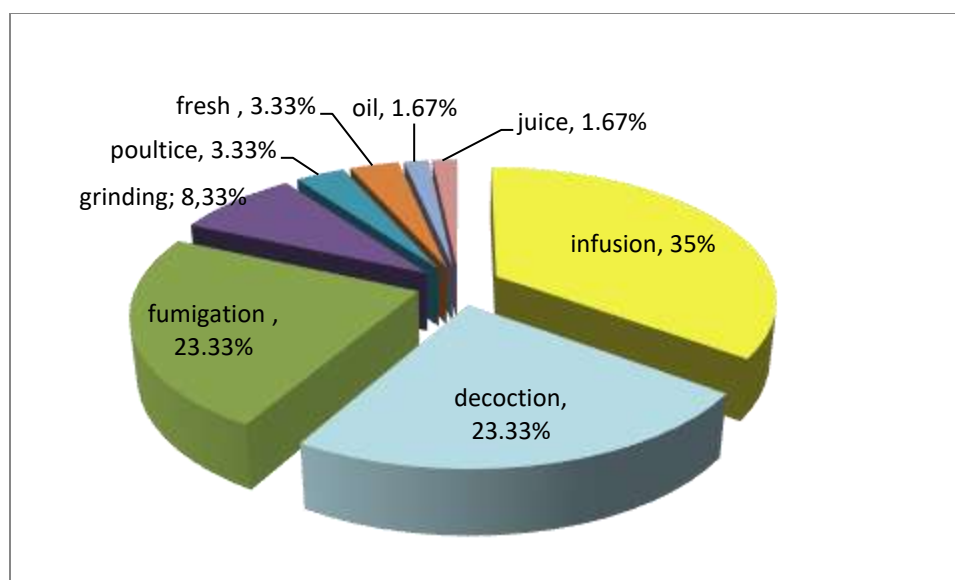
**4.5 Neurological disorders:** The “women healers” often prescribe medicinal plants for neurological disorders, of which the most adopted are *Aloysia citriodora* Palau, *Matricaria chamomilla* L., *Papaver rhoeas* L. and *Peganum harmala* L.( 11,4%) followed by *Melissa officinalis* L (8,6%) and *Calotropis procera* Aiton; *Cleome africana* Botsch; *Corrigiola telephiifolia* Pourr.; *Myristica fragrans* Houtt; *Nigella sativa* L.; *Origanum majorana* L.( 5,7% for each).

**Table 7:** percentage of species used by “women healers” to treat neurological disorders

| Species                                                                                                                                                                                            | Percentage use |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| <i>Aloysia citriodora</i> Palau; <i>Matricaria chamomilla</i> L.; <i>Papaver rhoeas</i> L.; <i>Perganum harmala</i> L.                                                                             | 11.4%          |
| <i>Melissa officinalis</i> L.                                                                                                                                                                      | 8.6%           |
| <i>Calotropis procera</i> Aiton; <i>Cleome africana</i> Botsch; <i>Corrigiola telephiifolia</i> Pourr.;<br><i>Myristica fragrans</i> Houtt; <i>Nigella sativa</i> L.; <i>Origanum majorana</i> L.; | 5.7%           |
| <i>Ajuga iva</i> (L.) Schreb ; <i>Carum carvi</i> L.; <i>Colocytis vulgaris</i> L.; <i>Lavandula dentata</i> L.;                                                                                   | 2.9%           |

**4.6 Mode of use:** The most adopted mode is infusion 35% while decoction and fumigation are 23.33% whereas powders 8.33% fresh state

and poultice are 3.33%, the other modes are very little used 1.67% (figure 8)



**Figure 8:** Mode of use of plant

**4.7 Parts of the plant used :** Based on the formulas adopted by these Women Healers, the leaves 22,22% and the aerial part 17,46%, and

seeds 14,29% are the most used followed by the fruits with 11,11% the flowers 7,94% while the other parts are less used 3.23% Figure 9.

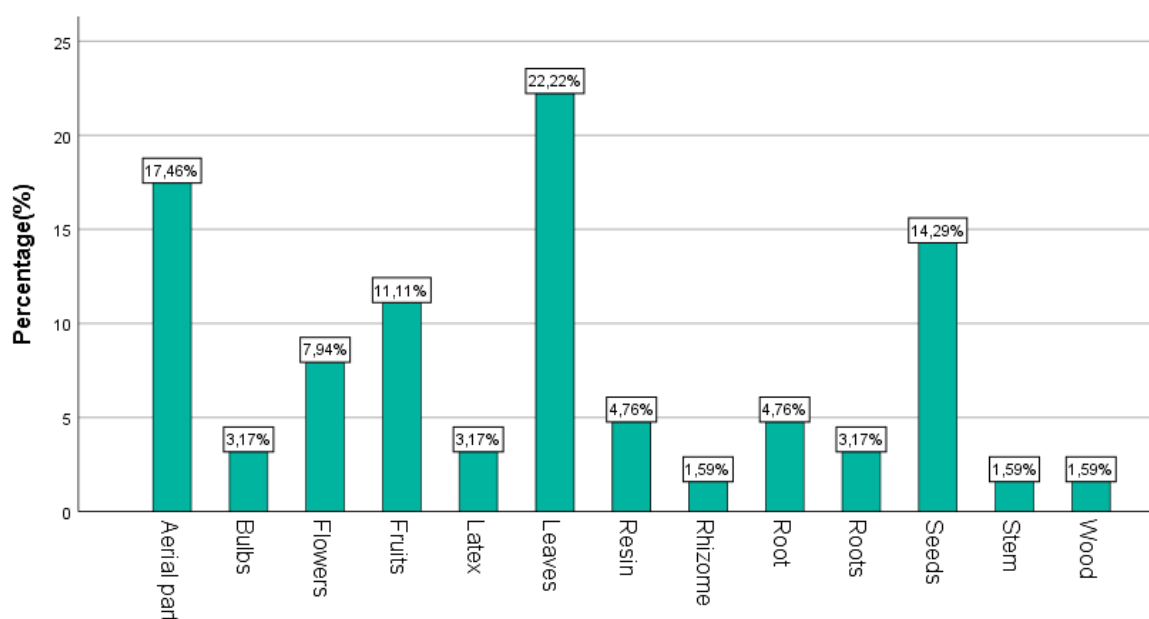


Figure 9: Plants parts used

## 5 DISCUSSION

Traditional healers and phytotherapy are important in health care in Morocco (El-hilaly and Hmammouchi, 2003) "women healers" occupy a very important place in the health sector in the Souss Massa region, they are the most frequented speciality of traditional medicine by the population 31%. Considered as traditional paediatricians, they treat children's diseases using manual techniques and medicinal plants, these women are mostly frequented by the population to treat digestive diseases (30%) and respiratory diseases (24%) of children as well as the incessant crying of babies (24%) attributed to the effects of sorcery "chem or ikda", "serra or Takmoust" and the evil eye is the disorder that drives more families to resort to them. The survey recorded 59 plant species, belonging to 34 families of which Lamiaceae (12.90%), Asteraceae and Apiaceae (9.68% for each) are the most widely used, this result is in conformity with that of a study of phytotherapy for children conducted in Algeria (Mkkedder, 2018). In the recipes they recommend, different parts of the

plants are used: the whole plant, the leaves, the roots, the fruits, the seeds. However, the leaves 32.26% and the seeds 22.58% are the most utilized this result is consistent with the many ethnobotanical studies conducted in other regions of Morocco (Benkhiguel *et al.*, 2010) (Rhattas *et al.*, 2016) (Daoudi *et al.*, 2016). Infusion is the most commonly used mode with a percentage of 35% in conformity with the results of different ethnobotanical studies carried out in different regions in Morocco (Hammiche and Maiza, 2006) (El Hilah *et al.*, 2015) whereas the dosage of the collected preparations is either by pinch, spoonful or by handful this is similar to an ethnobotanical study conducted in Morocco (Hammiche and Maiza, 2006) (Bouayyadi *et al.*, 2015) (Najem *et al.*, 2021). In general, medicinal plants that are prescribed are intoxicating, except for *Harmala peganum* L., and *Nerium oleander* L., the toxicity of the other plants used is linked to the dosage or mode of use. In particular, a bad decoction can generate toxic molecules.

## 6 CONCLUSION

Traditional medicine is largely used by many people in the Souss Massa region. Thus, “women healers” occupy an important place in the traditional health sector the people who have resorted to these “women healers” 81% are satisfied with their treatment, they have very

interesting knowledge of therapeutic techniques based on medicinal plants which is in extinction, so it is important to preserve and value this empirical know-how which is a natural and cultural heritage.

## 7 ACKNOWLEDGEMENTS

This work would not have been possible without the support of my supervisor Mr. Aarab Ahmed who taught me a lot about scientific research and who directed our work to achieve the determined objectives. I would like to thank all the “women healers” who shared with us their knowledge about the use of medicinal plants and

the herbalists who helped us to identify the medicinal plants.

**Declaration of interests:** The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## 8 REFERENCES

- Abouri, M., A. El Mousadik, F. Msanda, H. Boubaker, B. Saadi, and K. Cherifi. 2012. An ethnobotanical survey of medicinal plants used in the Tata Province, Morocco. *Int. J. Med. Plant Res.* 1:99–123.
- Achouri Amel et Djahida CHERKI. 2018. *Phytothérapie et Grossesse*. UNIVERSITE ABOU BEKR BELKAÏD.
- El Alami, J., M. Jandi, S. Amal, N. Akhdari, and O. Hocar. 2018. Ethnobotanique du Moyen Atlas: phytothérapie et apport des plantes médicinales en dermatocosmétologie. *Ann. Dermatol. Venereol.* 145:S337. doi:10.1016/j.annder.2018.09.552. Available from: <http://dx.doi.org/10.1016/j.annder.2018.09.552>
- Algieri, F., A. Rodriguez-Nogales, T. Vezza, J. Garrido-Mesa, N. Garrido-Mesa, M. P. Utrilla, M. R. González-Tejero, M. Casares-Porcel, J. Molero-Mesa, and M. del Mar Contreras. 2016. Anti-inflammatory activity of hydroalcoholic extracts of *Lavandula dentata* L. and *Lavandula stoechas* L. *J. Ethnopharmacol.* 190:142–158.
- Ansari, S. 2012. Ethnobotany and Pharmacognosy of Qust/ Kut (*Saussurea lappa*, C. B. Clarke) with Special Reference of Unani Medicine. *Pharmacogn. Rev.* 56:25.
- Aslam, N., and K. H. Janbaz. 2019. Studies on antidiarrheal and laxative activities of aqueous-ethanol extract of *Asphodelus tenuifolius* and underlying mechanisms. *BMC Complement. Altern. Med.* 19:1–10.
- El Azzouzi, F., and L. Zidane. 2015. La flore médicinale traditionnelle de la région de Béni- Mellal (Maroc). *J. Appl. Biosci.* 91:8493. doi:10.4314/jab.v9i11.8.
- Bahar, G. 2013. An ethnobotanical study of medicinal plants in Marmaris (Muğla, Turkey). *J. Ethnopharmacol.* 146:113–126. doi:10.1016/j.jep.2012.12.012.
- Barkaoui, M. 2018. Etude ethnobotanique des plantes médicinales dans les régions de Chtouka Ait Baha et de Tiznit. IBN ZOHR.
- Bellakhdar, J. 1997. Contribution à l'étude de la pharmacopée traditionnelle au Maroc: la situation actuelle, les produits, les sources du savoir (enquête ethnopharmacologique de terrain réalisée de 1969 à 1992).
- Benkhni, O., L. Zidane, M. Fadli, H.

- Elyacoubi, A. Rochdi, and A. Douira. 2010. Ethnobotanical study of medicinal plants in the Mechraâ Bel Ksiri region of Morocco. *Acta Bot. Barcinonensia*. 191–216.
- Bernardes, A., R. Lucarini, M. G. Tozatti, and M. G. M. Souza. 2010. Antimicrobial Activity of *Rosmarinus officinalis* against Oral Pathogens : Relevance of Carnosic Acid and Carnosol. 7:1835–1840.
- Bhadane, B. S. 2018. Ethnopharmacology, phytochemistry, and biotechnological advances of family Apocynaceae: A review. *Phyther. Res.* 1–30. doi:10.1002/ptr.6066.
- Bora, K., and A. Sharma. 2009. Phytoconstituents and therapeutic potential of *allium cepa* linn.- A Review. *Pharmacogn. Rev.* 3:170–180.
- Boskabady, M. H., N. Mohsenpoor, and L. Takaloo. 2010. Phytomedicine Antiasthmatic effect of *Nigella sativa* in airways of asthmatic patients. *Phytomedicine*. 17:707–713. doi:10.1016/j.phymed.2010.01.002. Available from: <http://dx.doi.org/10.1016/j.phymed.2010.01.002>
- Bouayyadi, L., M. El Hafian, and L. Zidane. 2015. Étude floristique et ethnobotanique de la flore médicinale dans la région du Gharb, Maroc. *J. Appl. Biosci.* 93:8770. doi:10.4314/jab.v93i1.10.
- Bouyahya, A., N. El, N. Elmenyiy, F. Guaouguaou, A. Balahbib, M. El-shazly, and I. Chamkhi. 2020. Ethnomedicinal use , phytochemistry , pharmacology , and toxicology of *Ajuga iva* ( L ., ) schreb. *J. Ethnopharmacol.* 258:112875. doi:10.1016/j.jep.2020.112875. Available from: <https://doi.org/10.1016/j.jep.2020.112875>
- El Bouzidi, L., C. A. Jamali, K. Bekkouche, L. Hassani, H. Wohlmuth, D. Leach, and A. Abbad. 2013. Chemical composition, antioxidant and antimicrobial activities of essential oils obtained from wild and cultivated Moroccan *Thymus* species. *Ind. Crops Prod.* 43:450–456. doi:10.1016/j.indcrop.2012.07.063. Available from: <http://dx.doi.org/10.1016/j.indcrop.2012.07.063>
- Chandra, S., and D. S. Rawat. 2015. Medicinal plants of the family Caryophyllaceae : a review of ethno-medicinal uses and pharmacological properties. *Integr. Med. Res.* 1–9. doi:10.1016/j.imr.2015.06.004. Available from: <http://dx.doi.org/10.1016/j.imr.2015.06.004>
- Chouragade, B. 2021. Dhooan: Therapeutics of Herbal Fumigation in Ayurvedic texts. *Interdiscip. J. Yagya Res.* 4:01–08. doi:10.36018/ijyr.v4i1.69.
- Daoubi, M., N. Marquez, N. Mazoir, A. Benharref, R. Hernández-Galán, E. Muñoz, and I. G. Collado. 2007. Isolation of new phenylacetylglucoside derivatives that reactivate HIV-1 latency and a novel spirotriterpenoid from *Euphorbia officinarum* latex. *Bioorganic Med. Chem.* 15:4577–4584. doi:10.1016/j.bmc.2007.04.009.
- Daoudi, A., M. Bammou, S. Zarkani, I. Slimani, J. Ibijbjen, and L. Nassiri. 2016. Étude ethnobotanique de la flore médicinale dans la commune rurale d'Aguelmouss province de Khénifra (Maroc). *Phytotherapie*. 14:220–228. doi:10.1007/s10298-015-0953-z.
- Eddouks, M., M. Ajbli, and M. Hebi. 2017. Ethnopharmacological survey of medicinal plants used in Daraa-Tafilalet region (Province of Errachidia), Morocco. *J. Ethnopharmacol.* 198:516–530. doi:10.1016/j.jep.2016.12.017. Available from: <http://dx.doi.org/10.1016/j.jep.2016.12.017>
- El Rhaffari, L., and A. Zaid. 2016. Pratique de la phytothérapie dans le sud-est du Maroc

- (Tafilaleet). Un savoir empirique pour une pharmacopée rénovée. Des sources du savoir aux médicaments du Futur. 293–318.  
doi:10.4000/books.irdeditions.7244.
- El-hilaly, J., and M. Hmamouchi. 2003. Ethnobotanical studies and economic evaluation of medicinal plants in Taounate province ( Northern Morocco ). J. Ethnopharmacol. 86:149–158. Doi: 10.1016/S0378-8741(03)00012-6.
- ElHabazi, K., R. Aboufatima, A. Benharref, A. Ziad, A. Chait, and A. Dalal. 2006. Study on the antinociceptive effects of *Thymus broussonetii* Boiss extracts in mice and rats. J. Ethnopharmacol. 107:406–411. doi:10.1016/j.jep.2006.03.029.
- Ghédira, K., and P. Goetz. 2017. Le henné *Lawsonia inermis* L. (Lythraceae). *Phytotherapie*. 15:85–90. doi:10.1007/s10298-017-1119-y.
- Ghourri, M., L. Zidane, E. Y. Houda, A. Rochdi, M. Fadli, and A. Douira. 2012. Etude floristique et ethnobotanique des plantes médicinales de la ville d'El Ouatia (Maroc saharien). *Kastamonu Üniversitesi Orman Fakültesi Derg.* 12:218–235. doi:10.17475/kuofd.05873.
- Goetz, P. 2014. Citrus limon (L.) Burm. f. (Rutacées) Citronnier. *Phytotherapie*. 12:116–121. doi:10.1007/s10298-014-0854-6.
- Gupta, V. K., A. Fatima, U. Faridi, A. S. Negi, K. Shanker, J. K. Kumar, N. Rahuja, S. Luqman, B. S. Sisodia, D. Saikia, M. P. Darokar, and S. P. S. Khanuja. 2008. Antimicrobial potential of *Glycyrrhiza glabra* roots &. 116:377–380. doi:10.1016/j.jep.2007.11.037.
- El Hafian, M., N. Benlandini, H. Elyacoubi, L. Zidane, and A. Rochdi. 2014. Étude floristique et ethnobotanique des plantes médicinales utilisées au niveau de la préfecture d'Agadir-Ida-Outanane (Maroc). *J. Appl. Biosci.* 81:7198. doi:10.4314/jab.v8i1.8.
- Hammiche, V., and K. Maiza. 2006. Traditional medicine in Central Sahara : Pharmacopoeia of Tassili N ' ajjer. J. Ethnopharmacol. 105:358–367. doi:10.1016/j.jep.2005.11.028.
- El Hilah, F., F. Ben Akka, J. Dahmani, N. Belahbib, and L. Zidane. 2015. Étude Ethnobotanique Des Plantes Médicinales Utilisées Dans Le Traitement Des Infections Du Système Respiratoire Dans Le Plateau Central Marocain. *J. Anim. Plant Sci.* 25:3886–3897.
- Houngnihin, R. 2009. Protocole de prise en charge du paludisme basé sur les pratiques traditionnelles efficaces au Bénin. Cotonou, PADS/BAD.
- Hussain, A. I., H. A. Rathore, M. Z. A. Sattar, S. A. S. Chatha, S. D. Sarker, and A. H. Gilani. 2014. *Citrullus colocynthis* (L.) Schrad (bitter apple fruit): A review of its phytochemistry, pharmacology, traditional uses and nutritional potential. *J. Ethnopharmacol.* 155:54–66. doi:10.1016/j.jep.2014.06.011. Available from: <http://dx.doi.org/10.1016/j.jep.2014.06.011>
- Idm'hand, E., F. Msanda, and K. Cherifi. 2020. Ethnobotanical study and biodiversity of medicinal plants used in the Tarfaya Province, Morocco. *Acta Ecol. Sin.* 40:134–144. doi:10.1016/j.chnaes.2020.01.002.
- Jamali, C. A., A. Kasrati, K. Bekkouche, L. Hassani, H. Wohlmuth, D. Leach, and A. Abbad. 2013. Phenological changes to the chemical composition and biological activity of the essential oil from Moroccan endemic thyme (*Thymus maroccanus* Ball). *Ind. Crops Prod.* 49:366–372. doi:<https://doi.org/10.1016/j.indcrop.2013.05.016>. Available from: <https://www.sciencedirect.com/science/article/pii/S0926669013002641>
- Kaur, R., and P. S. Jalandhar. 2013. *Glycyrrhiza glabra*: A Phytopharmacological Review.

- Int. J. Pharm. Sci. Res. 4:2470–2477.  
doi:10.13040/IJPSR.0975-8232.4(7).2470-77.
- Kharchoufa, L., I. A. Merrouni, A. Yamani, and M. Elachouri. 2018. Profile on medicinal plants used by the people of North Eastern Morocco: Toxicity concerns. *Toxicon*. 154:90–113.  
doi:10.1016/j.toxicon.2018.09.003.  
Available from: <https://doi.org/10.1016/j.toxicon.2018.09.003>
- Kizil, M., G. Kizil, M. Yavuz, and Ç. Aytekin. 2002. Antimicrobial Activity of Resins Obtained from the Roots and Stems of *Cedrus libani* and *Abies cilicia*. *Appl. Biochem. Microbiol.* 38:166–168.
- Lakhdar, M. 2018. Traditional uses , phytochemistry and biological activities of *Cotula cinerea* Del. *Trop. J. Pharm. Res.* 17:365–373.  
doi:dx.doi.org/10.4314/tjpr.v17i2.24.  
Available from: [www.tjpr.org](http://www.tjpr.org)
- Lakmichi, H., F. Z. Bakhtaoui, C. A. Gadhi, A. Ezoubeiri, Y. El Jahiri, A. El Mansouri, I. Zrara, and K. Loutfi. 2011. Toxicity Profile of the Aqueous Ethanol Root Extract of *Corrigiola telephiifolia* Pourr . ( *Caryophyllaceae* ) in Rodents. Evidence-Based Complement. Altern. Med. 2011. doi:10.1155/2011/317090.
- Loutfia, T., H. Hinde, S. Abdelmajid, R. Naima, O. Lahcen, B. Doha, M. Adbelrhani, and S. B. Rachida. 2013. Poisoning by plants in the Taza-Al hoceima-taounate region in Morocco. *Pakistan J. Sci. Ind. Res. Ser. B Biol. Sci.* 56:23–28.  
doi:10.52763/pjsir.biol.sci.56.1.2013.23.28.
- M.E. RODRÍGUEZ-CABEZAS et al. 2003. Intestinal anti-inflammatory activity of dietary fiber ( *Plantago ovata* seeds ) in HLA-B27 transgenic rats. *Clin. Nutr.* 22:463–471. doi:10.1016/S0261-5614(03)00045-1.
- El Maaiden, E., Y. El Kharrassi, N. A. S. Qarah, A. K. Essamadi, K. Moustaid, and B. Nasser. 2020. Genus *Ziziphus*: A comprehensive review on ethnopharmacological, phytochemical and pharmacological properties. Elsevier B.V. Available from: <https://doi.org/10.1016/j.jep.2020.112950>
- Mkkedder, N. 2018. Étude de l ’ utilisation de la phytothérapie chez l ’ enfant dans la région de Tlemcen ( Algérie ).
- Mohammedi, H., S. Mecherara-Idjeri, and A. Hassani. 2020. Variability in essential oil composition, antioxidant and antimicrobial activities of *Ruta montana* L. collected from different geographical regions in Algeria. *J. Essent. Oil Res.* 32:23–36.  
doi:10.1080/10412905.2019.1660238.  
Available from: <https://doi.org/10.1080/10412905.2019.1660238>
- Moloudizargari, M., P. Mikaili, S. Aghajanshakeri, and M. H. Asghari. 2013. Pharmacological and therapeutic effects of *Peganum harmala* and its main alkaloids. 7. doi:10.4103/0973-7847.120524.
- Monographie. 2019. Monographie Régionale souss massa Haut commissariat au plan diredtion régionale du souss massa.
- Moumene, F., F. Benali, M. Benabderahman, A. Benyamina, H. Selem, M. M. Dif, O. Alg, and O. Alg. 2016. Composition chimique et activité antibactérienne des huiles essentielles d ’ *Allium vineale* et *Allium sativum* de l ’ Ouest Algérien. doi:10.1007/s10298-016-1038-3.
- Najem, M., J. Ibijbjen, and L. Nassiri. 2021. European Journal of Integrative Medicine Ethnobotanical treatment of respiratory diseases in the central Middle Atlas ( Morocco ): Qualitative and quantitative approach. *Eur. J. Integr. Med.* 46:101358.  
doi:10.1016/j.eujim.2021.101358.  
Available from: <https://doi.org/10.1016/j.eujim.2021.101358>
- Obese, E., R. P. Biney, I. T. Henneh, D.

- Anokwah, E. A. Adakudugu, E. Woode, and E. O. Ameyaw. 2021. Antinociceptive effect of the hydroethanolic leaf extract of *Calotropis procera* (Ait) R. Br. (Apocynaceae): Possible involvement of glutamatergic, cytokines, opioidergic and adenosinergic pathways. J. Ethnopharmacol. 278:114261. doi:10.1016/j.jep.2021.114261. Available from: <https://doi.org/10.1016/j.jep.2021.114261>
- Omosa, L. K., J. O. Midiwo, and V. Kuete. 2017. *Curcuma longa*. Elsevier Inc. Available from: <http://dx.doi.org/10.1016/B978-0-12-809286-6/00019-4>
- OMS. 2002. Stratégie de l'OMS pour la Médecine Traditionnelle pour 2002 – 2005.
- Ouhaddou, H., H. Boubaker, F. Msanda, and A. El Mousadik. 2015. An ethnobotanical study of medicinal plants of the Agadir Ida Ou Tanane province (southwest Morocco). J. Appl. Biosci. 84:7707. doi:10.4314/jab.v84i1.5.
- Pandey, M. M., S. Rastogi, and A. K. S. Rawat. 2007. *Saussurea costus*: Botanical, chemical and pharmacological review of an ayurvedic medicinal plant. J. Ethnopharmacol. 110:379–390. doi:10.1016/j.jep.2006.12.033.
- Qasim Barkat, M., and H. Khalid Mahmood. 2018. Phytochemical and Antioxidant Screening of *Zingiber Officinale*, *Piper Nigrum*, *Rutag Raveolanes* and *Carum Carvi* and Their Effect on Gastrointestinal Tract Activity. Matrix Sci. Medica. 2:09–13. doi:10.26480/msm.01.2018.09.13.
- Ragone, M. I., M. Sella, P. Conforti, M. G. Volonté, and A. E. Consolini. 2007. The spasmolytic effect of *Aloysia citriodora*, Palau (South American cedrón) is partially due to its vitexin but not isovitexin on rat duodenum. J. Ethnopharmacol. 113:258–266. doi:10.1016/j.jep.2007.06.003.
- Rammal, H., J. Bouayed, C. Younos, and R. Soulimani. 2009. Notes ethnobotanique et phytopharmacologique d'*argania spinosa* L. Phytotherapie. 7:157–160. doi:10.1007/s10298-009-0386-7.
- Redouan, F. Z., G. Benítez, R. M. Picone, A. Crisafulli, C. Yebouk, M. Bouhbal, A. Ben Driss, M. Kadiri, J. Molero-Mesa, and A. Merzouki. 2020. Traditional medicinal knowledge of Apiaceae at Talassemtane National Park (Northern Morocco). South African J. Bot. 131:118–130. doi:10.1016/j.sajb.2020.02.004. Available from: <https://doi.org/10.1016/j.sajb.2020.02.004>
- Rhattas, M., A. DOUIRA, and L. ZIDANE. 2016. Étude ethnobotanique des plantes médicinales dans le Parc National de Talassemtane (Rif occidental du Maroc). J. Appl. Biosci. 97:9187. doi:10.4314/jab.v97i1.5.
- Savino, F., F. Cresi, E. Castagno, L. Silvestro, and R. Oggero. 2005. A randomized double-blind placebo-controlled trial of a standardized extract of *Matricariae recutita*, *Foeniculum vulgare* and *Melissa officinalis* (ColiMil®) in the treatment of breastfed colicky infants. Phyther. Res. An Int. J. Devoted to Pharmacol. Toxicol. Eval. Nat. Prod. Deriv. 19:335–340.
- Scherrer, A. M., R. Motti, and C. S. Weckerle. 2005. Traditional plant use in the areas of Monte Vesole and Ascea Cilento National Park (Campania, Southern Italy). J. Ethnopharmacol. 97:129–143. doi:10.1016/j.jep.2004.11.002.
- Sijelmassi, A. 1996. Les plantes médicinales du Maroc. Le Fennec. Editions Le Fennec, Casablanca. Morocco.
- Singh, J., A. Baghotia, and S. P. Goel. 2012. *Eugenia caryophyllata* Thunberg (Family Myrtaceae): A Review. Int. J. Res. Pharm. Biomed. Sci. 3:1469–1475.
- Sisay, M., and T. Gashaw. 2017. Ethnobotanical

- de la ville de Kénitra (Maroc). REVESCO Rev. Estud. Coop. 121:7–32. doi:10.5209/rev.
- Soulamani, R., C. Younos, S. Jarmouni-idrissi, D. Bousta, F. Khalouki, and A. Laila. 2001. Behavioral and pharmaco-toxicological study of Papa 6 er rhoeas L . in mice. J. Ethnopharmacol. 74:265–274.
- Trombetta, D., C. Puglia, D. Perri, A. Licata, S. Pergolizzi, E. R. Lauriano, A. De Pasquale, A. Saija, and F. P. Bonina. 2006. Effect of polysaccharides from Opuntia ficus-indica (L.) cladodes on the healing of dermal wounds in the rat. Phytomedicine. 13:352–358. doi:10.1016/j.phymed.2005.06.006.
- , Ethnopharmacological , and Phytochemical Studies of Myrtus communis Linn: A Popular Herb in Unani System of Medicine. J. Evid. Based. Complementary Altern. Med. 22:1035–1043. doi:10.1177/2156587217718958.
- Sonavane, G. S., V. P. Sarveiya, V. S. Kasture, and S. B. Kasture. 2002. Anxiogenic activity of Myristica fragrans seeds. Pharmacol. Biochem. Behav. 71:239–244. doi:10.1016/S0091-3057(01)00660-8.
- Souad Salhi, Mohamed Fadli, L. Z. & A. D. 2010. Etudes floristique et ethnobotanique des plantes médicinales

## Annexe 1

| Species                                       | Local Arabic name  | Local amazigh name | Part used   | Famille    | How to use it                     | Therapeutic effect                                                                                                           | Disorder or disease treated              |
|-----------------------------------------------|--------------------|--------------------|-------------|------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| <i>Ammodaucus leucotrichus</i> Coss.<br>TaiC5 | Camoun essofo      | Camoun tiaarabin   | Fruits      | Apiaceae   | Infusion                          | Carminative, diuretic and digestive stimulant (El Hafian <i>et al.</i> , 2014)(Abouri <i>et al.</i> , 2012)                  | diarrhea                                 |
| <i>Foeniculum vulgare</i> Mill.<br>TaiC25     | Habbat hlawa       |                    | Seeds       | Apiaceae   | infusion                          | Carminative and antispasmodic ,(Redouan <i>et al.</i> , 2020) diuretic, anti inflammatory .(Scherrer <i>et al.</i> , 2005)   | Constipation, colic                      |
| <i>Pimpinella anisum</i> L.<br>TaiC43         | Nafaa              | bsbas              | Seeds       | Apiaceae   | infusion                          | Spasmolytic, digestive carminative, diuretic (Eddouks <i>et al.</i> , 2017) (Barkaoui, 2018)                                 | Constipation, colic                      |
| <i>Rosa damascena</i> Mill.<br>TaiC45         | Ward elbeldi       | Elwerd             | Flowers     | Rosaceae   | Infusion                          | Gastric pain and stomach ailments , (El Hafian <i>et al.</i> , 2014)                                                         | Diarrhea, constipation, insomnia         |
| <i>Cassia senna</i> L.<br>TaiC13              | Sana ou Sana Makki | Sana               | Leaves      | Fabaceae   | decoction                         | Purgative (El Azzouzi and Zidane, 2015) (Barkaoui, 2018)                                                                     | Constipation                             |
| <i>Asphodelus tenuifolius</i> Cav.<br>TaiC8   | Lberwak            | Tizyit             | Aerial part | Liliaceae  | Infusion or decoction             | Diuretic (Aslam and Janbaz, 2019)                                                                                            | Diarrhea,Constipation , colic            |
| <i>Linum usitatissimum</i> L.<br>TaiC30       | Zeiaat elktane     |                    | Seeds       | Linaceae   | Infusion                          | Antispasmodic, anti inflammatory (Scherrer <i>et al.</i> , 2005) gastrointestinal diseases .(El Azzouzi and Zidane, 2015)    | Constipation                             |
| <i>Artemisia herba-alba</i> Asso<br>TaiC7     | Echih              | izri               | Flowers     | Asteraceae | Cataplasm, Infusion or fumigation | antispasmodic carminative, vermifuge, intestinal antiseptic, respiratory disorders, burns (Souad Salhi, Mohamed Fadli, 2010) | Oxyurosis, Cold, Flu, bloating, brulures |
| <i>Matricaria chamomilla</i> L.<br>TaiC32     | Babounj            |                    | Flowers     | Asteraceae | Infusion                          | Digestive disorders calming and anti spasmodic (Savino <i>et al.</i> , 2005) (El Azzouzi and Zidane, 2015) nervous           | Diarrhea , ballooning insomnia           |



|                                                      |             |                  |             |                |                                  |                                                                                                                                             |                                        |
|------------------------------------------------------|-------------|------------------|-------------|----------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
|                                                      |             |                  |             |                |                                  | disorders (Eddouks <i>et al.</i> , 2017)                                                                                                    |                                        |
| <b><i>Rosmarinus officinalis</i> L.</b><br>TaiC46    | Yazir       |                  | Leaves      | Lamiaceae      | Decoction                        | Digestive disorders (Abouri <i>et al.</i> , 2012) antimicrobial (Bernardes <i>et al.</i> , 2010) antiseptic (Scherrer <i>et al.</i> , 2005) | Colic, Oxyurosis,                      |
| <b><i>Allium sativum</i> L.</b><br>TaiC3             | Touma       | tiskert          | Bulbs       | Liliaceae      | Fresh, fumigation                | Respiratory and intestinal disorders (Eddouks <i>et al.</i> , 2017) antibiotique (Moumene <i>et al.</i> , 2016)                             | Cold, Flu, skin pimples, colic         |
| <b><i>Plantago ovata</i> Forssk.</b><br>TaiC44       | Zerkouna    |                  | Seeds       | Plantaginaceae | poultice                         | Laxative and anti diarrhea (Achouri Amel et Djahida CHERKI, 2018) anti inflammatory (M.E. RODRIGUEZ-CABEZAS <i>et al.</i> , 2003)           | Oxyurosis                              |
| <b><i>Trigonella foenum-graecum</i> L.</b><br>TaiC53 | Helba       | tifidas          | Seeds       | Fabaceae       | cataplasm                        | nervous disorders, headache (Eddouks <i>et al.</i> , 2017)                                                                                  | Effects attributed to sorcery « Serra» |
| <b><i>Glycyrrhiza glabra</i> L</b><br>TaiC26         | Aareq souss |                  | Root        | Fabaceae       | decoction                        | anti inflammatory , antimicrobial, Anti-cough (Gupta <i>et al.</i> , 2008) (Kaur and Jalandhar, 2013)                                       | Asthma, cold                           |
| <b><i>Aloysia citriodora</i> Palau</b><br>TaiC4      | Lwiza       |                  | Leaves      | Verbenaceae    | infusion                         | Sedative (Idm'hand <i>et al.</i> , 2020), antispasmodic (Ragone <i>et al.</i> , 2007)                                                       | Colics, insomnia                       |
| <b><i>Carum carvi</i> L.</b><br>TaiC12               | Elkarwia    | karwit           | Seeds       | Apiaceae       | Infusion                         | Stomach disorder, antioxidant and anti-stress (Qasim Barkat, and Khalid Mahmood, 2018)                                                      | Colic, bloating, insomnia              |
| <b><i>Thymus broussonetii</i> Boiss.</b><br>TaiC51   | "zaaitra",  | tazoknit aserkna | Leaves      | Lamiaceae      | Infusion                         | Anti nociceptive (ElHabazi <i>et al.</i> , 2006) Antimicrobial (El Bouzidi <i>et al.</i> , 2013)                                            | Colic                                  |
| <b><i>Thymus maroccanus</i> Ball</b><br>TaiC52       | Zaatar      | azoukni          | Leaves      | Lamiaceae      | Decoction or infusion fumigation | antimicrobial (El Bouzidi <i>et al.</i> , 2013)(Jamali <i>et al.</i> , 2013)                                                                | Colic, cold, Flu, Asthma               |
| <b><i>Zygophyllum gaetulum</i> Emb. &amp; Maire</b>  | Laagaya     |                  | Aerial part | Zygophyllaceae | Powder or infusion               | Digestive disorder and burns (El Hafian <i>et al.</i> , 2014)                                                                               | Colics, Eczema                         |



|                                                                       |                     |                  |                     |               |                          |                                                                                                                               |                                                                           |
|-----------------------------------------------------------------------|---------------------|------------------|---------------------|---------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| TaiC55                                                                |                     |                  |                     |               |                          |                                                                                                                               |                                                                           |
| <i>Boswellia frereana</i><br>Birdw.<br>TaiC9                          | Ljawi               |                  | Resin               | Styracaceae   | Fumigation               | respiratory antiseptic (Barkaoui, 2018)                                                                                       | Flu, cold, effects attributed to sorcery                                  |
| <i>Lavandula dentata</i> L.<br>TaiC28                                 | Lkhzama             |                  | Aerial part         | Lamiaceae     | infusion                 | Anti inflammatory (Algieri <i>et al.</i> , 2016)                                                                              | Flu, cold, énurésie                                                       |
| <i>Myrtus communis</i> L.<br>TaiC35                                   | Rihane              |                  | Leaves and fruits   | Myrtaceae     | Infusion                 | Antimicrobial, antidiabetic, antispasmodic, vasodilator (Sisay and Gashaw, 2017)                                              | Flu, cold                                                                 |
| <i>Cotula cinerea</i> Delile<br>TaiC19                                | Grtofa              |                  | Leaves and branches | Asteraceae    | Infusion                 | antibacterial, antifungal, antioxidant, anti-diarrheal (Lakhdar, 2018)                                                        | Cold, Flu                                                                 |
| <i>Nigella sativa</i> L.<br>TaiC37                                    | Sanouj, haba sawda  | Chanouj          | Seeds               | Ranunculaceae | Infusion, fumigation     | Antiasmatic (Boskabady <i>et al.</i> , 2010) psoriasis (El Alami <i>et al.</i> , 2018)                                        | Eczema, effects attributed to sorcery "chem", énurésie                    |
| <i>Cedrus libani subsp. atlantica</i> (Endl.) Batt. & Trab.<br>TaiC14 | qetran              | Kedran ou oujane | Resin               | Pinaceae      | Cataplasma fumigation    | anti microbial (Kizil <i>et al.</i> , 2002) dermatosis (Abouri <i>et al.</i> , 2012)                                          | evil eye, chem et effects attributed to sorcery serra, dermatosese        |
| <i>Olea europea</i> L.<br>TaiC38                                      | Zaytoun             | Azmour           | Fruit               | Oleaceae      | Oil                      | Digestive and respiratory disorders (Rhettas <i>et al.</i> , 2016) skin care and Cicatrisante (El Alami <i>et al.</i> , 2018) | Constipation, Cold, Flu, Eczema, effects attributed to sorcery, psoriasis |
| <i>Lawsonia inermis</i> L.<br>TaiC29                                  | Henna               | henna            | Leaves              | Lythraceae    | Powder, poultice         | Antiseptic, anti-inflammatory, analgesic, cicatrisante (Ghédira and Goetz, 2017)                                              | Eczema, wounds                                                            |
| <i>Curcuma longa</i> L.<br>TaiC21                                     | Kherkom beldi       |                  | Rhizome             | Zingiberaceae | Powder poultice          | anti-inflammatory, antibacterial, fungal and antiviral (Omosa <i>et al.</i> , 2017)                                           | Skin pimples, wounds                                                      |
| <i>Peganum harmala</i> L.<br>TaiC42                                   | Elharmel            |                  | Seeds               | Nitrariaceae  | Decoction and fumigation | Nervous disorders, antispasmodic, (Moloudizargari <i>et al.</i> , 2013)                                                       | Colics, Epilepsy                                                          |
| <i>Nerium oleander</i> L.<br>TaiC36                                   | Defla ou asa moussa | alili            | Roots               | Apocynaceae   | fumigation               | Nervous system-depressant activity (Bhadane, 2018)                                                                            | Effects attributed to sorcery, evil eye.                                  |
| <i>Chenopodium ambrosioides</i> L.<br>TaiC15                          | Mkhinza             | Tawjant          | Leaves              | Amaranthaceae | Infusion or decoction    | Cough, fever and antidiarrhea (Ghourri <i>et al.</i> , 2012)                                                                  | Cold, Flu, Colic insomnia                                                 |
| <i>Papaver rhoeas</i> L.<br>TaiC41                                    | Belaaman            |                  | Flowers             | Papaveraceae  | infusion                 | Sedative (Soulamani <i>et al.</i> , 2001) (Scherrer <i>et al.</i> , 2005)                                                     | insomnia                                                                  |



|                                                                                        |           |                  |               |                |                     |                                                                                                                             |                                         |
|----------------------------------------------------------------------------------------|-----------|------------------|---------------|----------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| <i>Myristica fragrans</i><br>Houtt.<br>TaiC34                                          | Igouza    | Igouza           | Fruits        | Myristicaceae  | powder              | Sedative (Sonavane <i>et al.</i> , 2002)                                                                                    | insomnia                                |
| <i>Calotropis procera</i><br>(Aiton) Dryand.<br>TaiC10                                 |           | Tawrzat          | Leaves, latex | Apocynaceae    | poultice            | skin lesions (Ullah <i>et al.</i> , 2014)<br>Analgesic (Obese <i>et al.</i> , 2021)                                         | Eczema                                  |
| <i>Warionia saharae</i><br>Benthem ex Benth. & Coss.<br>TaiC54                         |           | Afsass ou afzdad | Leaves        | Compositae     | infusion            | Epilptic seizures (Loutfia <i>et al.</i> , 2013)                                                                            | Epilepsy                                |
| <i>Ziziphus lotus</i> (L.)<br>Lam.<br>TaiC56                                           | Sedra     | Azouggar         | Leaves        | Rhamnaceae     | infusion            | Sedative (El Maaiden <i>et al.</i> , 2020)                                                                                  | evil eye, effects attributed to sorcery |
| <i>Ferula assa-foetida</i> L.<br>TaiC23                                                | Haltite   |                  | Resin         | Apiaceae       | Fumigation          | mental disorders (Chouragade, 2021)                                                                                         | evil eye                                |
| <i>Ruta montana</i> L.<br>TaiC47                                                       | Fijel     | Iwermi           | Aerial part   | Rutaceae       | fumigation          | Antiepileptic, antispasmodic, antioxidant and antimicrobial (Mohammedi <i>et al.</i> , 2020)                                | evil eye, Epilepsy                      |
| <i>Liquidambar orientalis</i><br>Mill<br>TaiC31                                        | El myaa   |                  | Resin         | Altingiaceae   | Cataplasm           | Psychotonic et sedative (Bahar, 2013)                                                                                       | evil eye, effects attributed to sorcery |
| <i>Ajuga iva</i> (L.) Schreb.<br>TaiC1                                                 | Chendgora | Timirna          | Aerial part   | Lamiaceae      | Infusion, Decoction | Respiratory disorders (El Hafian <i>et al.</i> , 2014) digestive and neurological disorders (Bouyahya <i>et al.</i> , 2020) | colic, cold                             |
| <i>Corrigiola litoralis</i><br>subsp. <i>telephiifolia</i><br>(Pourr.) Briq.<br>TaiC20 | Serghina  | Tasrghint        | Root          | Molluginaceae  | Fumigation          | Flu and cough (Najem <i>et al.</i> , 2021) analgesic (Lakmichi <i>et al.</i> , 2011) (Chandra and Rawat, 2015)              | effects attributed to sorcery, evil eye |
| <i>Hammada scoparia</i><br>(Pomel) Iljin<br>TaiC27                                     | Erramt    | Assay            | Aerial part   | Amaranthaceae  | Cataplasm           | Cicatrissant (Abouri <i>et al.</i> , 2012)(Kharchoufa <i>et al.</i> , 2018)                                                 | Wounds                                  |
| <i>Citrus limon</i> (L.)<br>Osbeck<br>TaiC17                                           | Lhamed    | Talhamet         | Fruit         | Rutaceae       | Fresh, juice        | Dermatosis and eczema (Goetz, 2014)                                                                                         | dermatose                               |
| <i>Allium cepa</i> L.<br>TaiC3                                                         | Besla     | Azalim           | bulb          | Amaryllidaceae | Juice               | antimicrobial, Anti-inflammatory (Bora and Sharma, 2009)                                                                    | Cold                                    |



|                                                                                                      |                      |         |                |                   |                                |                                                                                                                 |                                  |
|------------------------------------------------------------------------------------------------------|----------------------|---------|----------------|-------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------|
| <i>Ferula communis</i><br><i>subsp. brevifolia</i> (Link<br>ex Schult.) Elalaoui ex<br>Dobignard     | Elfasokh             |         | fruits         | Apiaceae          | fumigation                     | Spasmolytic (Kharchoufa <i>et al.</i> ,<br>2018)                                                                | evil eye, epilipsie              |
| <i>Argania spinosa</i> (L.)<br>Skeels<br>TaiC6                                                       | Argane               | Argane  | seeds          | Sapotaceae        | oil                            | Dermatosis and burns<br>(Rammal <i>et al.</i> , 2009)                                                           | Eczema, dermatose,<br>psoriasis  |
| <i>Syzygium aromaticum</i><br>(L.) Merr. &<br>L.M.Perry .<br>TaiC49                                  | Qronfel              |         | Flowers        | Myrtaceae         | Decoction<br>and<br>inhalation | Respiratory diseases (Singh <i>et</i><br><i>al.</i> , 2012)                                                     | Cold , Flu, asthm                |
| <i>Tetraclinis articulata</i><br>(Vahl) Mast.<br>TaiC50                                              | aaraar               | azouka  | Leaves         | Cupressac<br>eae  | Fumigatio<br>n                 | Nervous Disorders<br>(Ouhaddou <i>et al.</i> , 2015)                                                            | Effects attributed to<br>sorcery |
| <i>Saussurea costus</i><br>(Falc.) Lipsch.<br>TaiC48                                                 | Elqist elhindi       |         | Roots          | Composita<br>e    | Fumigatio<br>n                 | anti-inflammatory, anti-ulcer<br>(Pandey <i>et al.</i> , 2007) nervine<br>and brain disorders (Ansari,<br>2012) | Effects attributed to<br>sorcery |
| <i>Euphorbia</i><br><i>officinarum subsp.</i><br><i>echinus</i> (Hook.f. &<br>Coss.) Vindt<br>TaiC22 | Daghmouss            | Tikiout | Latex          | Euphorbia<br>ceae | Cataplasm                      | skin diseases (Daoubi <i>et al.</i> ,<br>2007)                                                                  | Skin pimples, wounds             |
| <i>Opuntia ficus-indica</i><br>(L.) Mill.<br>TaiC39                                                  | Elhindia             | Taknari | Stem           | Cactaceae         | Cataplasm                      | skin lesions (Trombetta <i>et al.</i> ,<br>2006)                                                                | Wounds                           |
| <i>Melissa officinalis</i> L.<br>TaiC33                                                              | Naanaa soufi         |         | Leaves         | Lamiaceae         | Infusion                       | Relaxant (Savino <i>et al.</i> , 2005)                                                                          | Inomnia                          |
| <i>Cleome africana</i><br>Botsch<br>TaiC18                                                           | Lmkhinza<br>sahrawia |         | Leaves         | Cleomacea<br>e.   | decoction                      | Digestive diseases: abdominal<br>pains Muscular and rheumatic<br>pains(Hammiche and Maiza,<br>2006)             | Inomnia                          |
| <i>Origanum majorana</i><br>L.<br>TaiC40                                                             | Merdedouch           |         | Aerial<br>part | Lamiaceae         | Infusion                       | Insomnia and headach<br>(Sijelmassi, 1996)                                                                      | Inomnia                          |
| <i>Citrullus colocynthis</i><br>(L.) Schrad.<br>TaiC16                                               | lhdej                | Afrziz  | Fruit          | Cucurbitac<br>eae | Cataplasm                      | Antimicrobial (Hussain <i>et al.</i> ,<br>2014)                                                                 | Wounds                           |