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An ethnobotanical study of traditional medicinal plants used by local population of circle Ait Baha

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ABSTRACT

An ethnobotanical survey was realized in the circle AitBaha (Province of ChtoukaAitBaha, Souss Massa Draa) with the aim to constitute a catalog of medicinal plants andcollect all thedata about therapeutic usage of plants in human therapy. Theethnobotanicalstudy was carried out over a period the two years (2013, 2014). The survey led with the local population had permittedto identify48 medicinal plants. This study also had allowed to notice that leaves constitute the most used parts andthatthe most frequent preparation modein the therapeutic treatment is the decoction. The majority of medicinal species are mainly used against diseases of the digestive systems (35%), respiratory (22%) and metabolic disorders (11%).

The results are a very valuable source of information for the study area and the scientific community. They could be a database for futureresearch in the fields of phytochemistry and pharmacology in order to search for new natural substances.

KEYWORDS

Ethnobotanical survey;
Medicinal plants;
Circle AitBaha.

INTRODUCTION

In recent years,due to its undeniable effectiveness, the phytotherapyis gradually introduced into the daily lives of people. The aim is to search the naturals therapeutics, without side effects or less aggressive effects as possible[17].

By the richness and diversity of the origin ofMorocco's flora, this last one constitutes a real phytogenetic reservoir, with 4500 species and subspecies of vascular plants. This allowed it to occupy a privileged place among Mediterranean countries with a long medical tradition and a deep traditional knowledge in the medicinal plants areas[15].

Medicinal plants remaina source of medical care in developing countries in the absence of a modern medicinal system [18]. TheKnowledge of the uses of medicinal plants and their propertiesis usually acquired aftera long accumulated experience and passed from generation to generation, but it is oftenin danger because transmission between older and younger generation is not always assured[1, 2]. The inventory of this knowledge is extremely useful, but it may disappear because of the lifestyles and communication evolution[3].

This study, conducted in the circle of AitBaha

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aims to contribute to make a catalog in this region and gather much information as possible on the therapeutic uses practiced by the local people.

MATERIALS AND METHODS

Description of the study area

The region of Souss Massa Deraâis limited to the North by Marrakech-Tensift-Al Hauoz, to the South by Guelmim-Es-Semara, to the East by Meknès –Tafilalet and to the West by the Atlantic Ocean, extends over a surface of 72.506km² (10% of the total kingdom's area)[10]. It has five provinces (ChtoukaAitBaha, Tiznit, Taroudant, Ouarzazateand Zagora) and two prefectures (Agadir-Ida-Outanane and d'Inezgane-Ait-Melloul). It contains 239 municipalities with 212 rural and 27 urban[10].

The study area of circle AitBaha, which is part of province ChtoukaAitBaha, this latterhas an area of 3523 km, constitutes 5% of the total soussmassadaraa's surface, it includes 22 municipalities, two of which are urban areas (Biougraand Ait Baha). Theremaining 20 rural municipalities are attachedto three circles (Biougra, Ait Bahaand Belfaa Massa)[5].

The climate is dry in summer, cold in winter with an average temperature of 18.7 ° C and a pluviometry at high spatial-temporal variation ranging from 250 to 350 mm / year[5].

Methodology

Anethnobotanical survey was carried out in circle AitBaha, during two campaigns in 2013 and 2014. The zone of study was divided into 4 stratums that correspond to the numbers of circle AitBaha'scaïdats (Figure 1).

The Stratified sampling is performed in a simple random way[12]. The number of surveyed people by Caïdat is 45,the four caïdats are the following:caïdatAitMzal, caïdatAitOuadrim, caïdat of Tanalt and caïdat of Ida Ougnidif.

This survey was performed using apre-established questionnaire (Annex 1), it permitted to realize 180 interviews with elderly between approximately 17 and69 years. The collected data contain detailed information on the interviewed persons (age, sex, study level and family situation) and on the exploited plants (vernacular name, usage part, medicinal usages, dose and preparation mode).

Thedetermining of the scientific nomenclature was performed by the following documents:

- Medicinal plants of Morocco of Sijelmassi (1993).

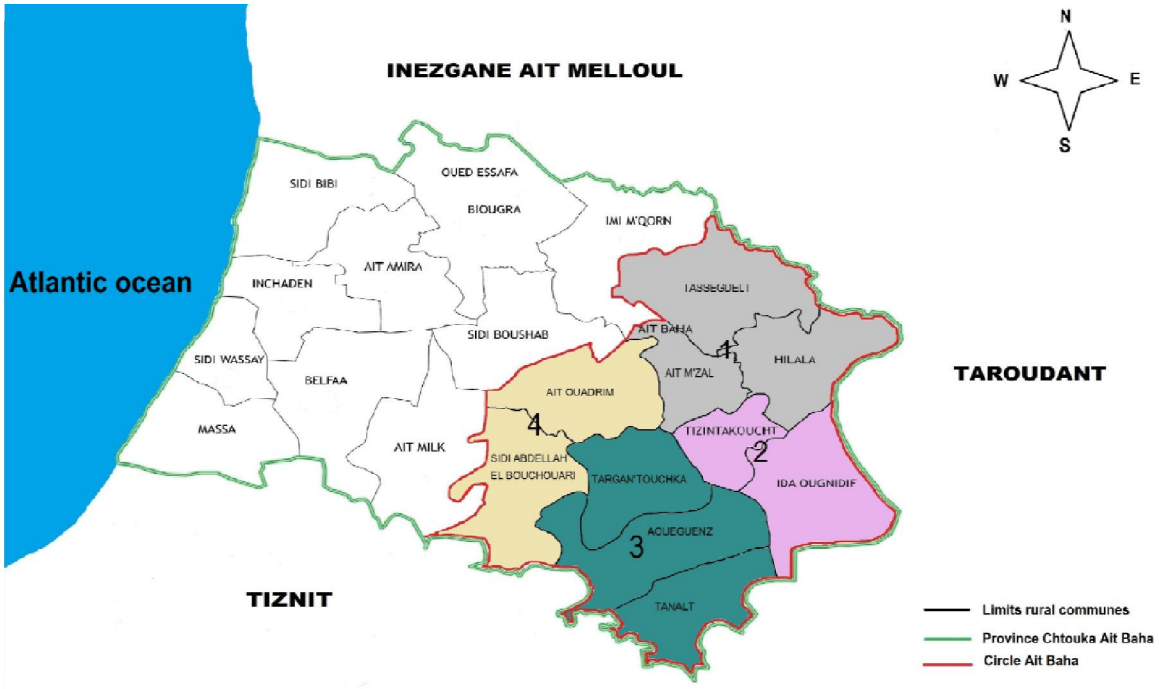

Figure 1 : Distribution of survey points at circle Ait Baha

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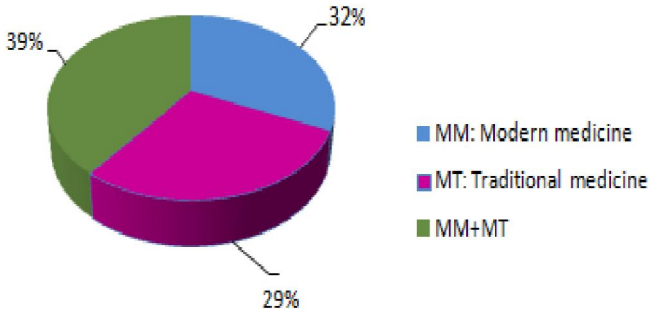

Figure 2 : The use's distribution of both types of medicine (traditional and modern)

- The traditional Moroccan pharmacopoeia of Bellakhder (1997)
- Moroccan Flora'[8]
- Vascular Flora of Morocco, Inventory and Chorology'[9,11].

Finally, the ethnobotanical data was transferred in a database using the software SPSS.

RESULTS AND DISCUSSION

Choice between traditional and modern medicine

The survey led with the local population of the circle AitBaha, allowed us to divide the population into 3 classes (Figure 2). The responses of 180 interviewed persons gave the following arrangement:

- 52 people have recourse only to the traditional medicine,
- 58 people have recourse only to the modern medicine,
- 72 individuals use both herbal medicine and modern medicine.

According to the results of the survey, the number ofthe medicinal plants usersis 124(68 % of the population).

Use of medicinal plants according to the profile of respondents

According to the age

The average age of interviewed persons is about 38 years old. However, the use of medicinal plants in the study area concerns all age groups (Figure 3, A). The predominance tends to persons aged 31 to 50 years (55%). We noticed that for the age group 17 to 30 years, the rate of use is 27%, for older people, the use of medicinal plants represents only 18%.

The results show that people who belong to the age group (31-50) have more knowledge about plants

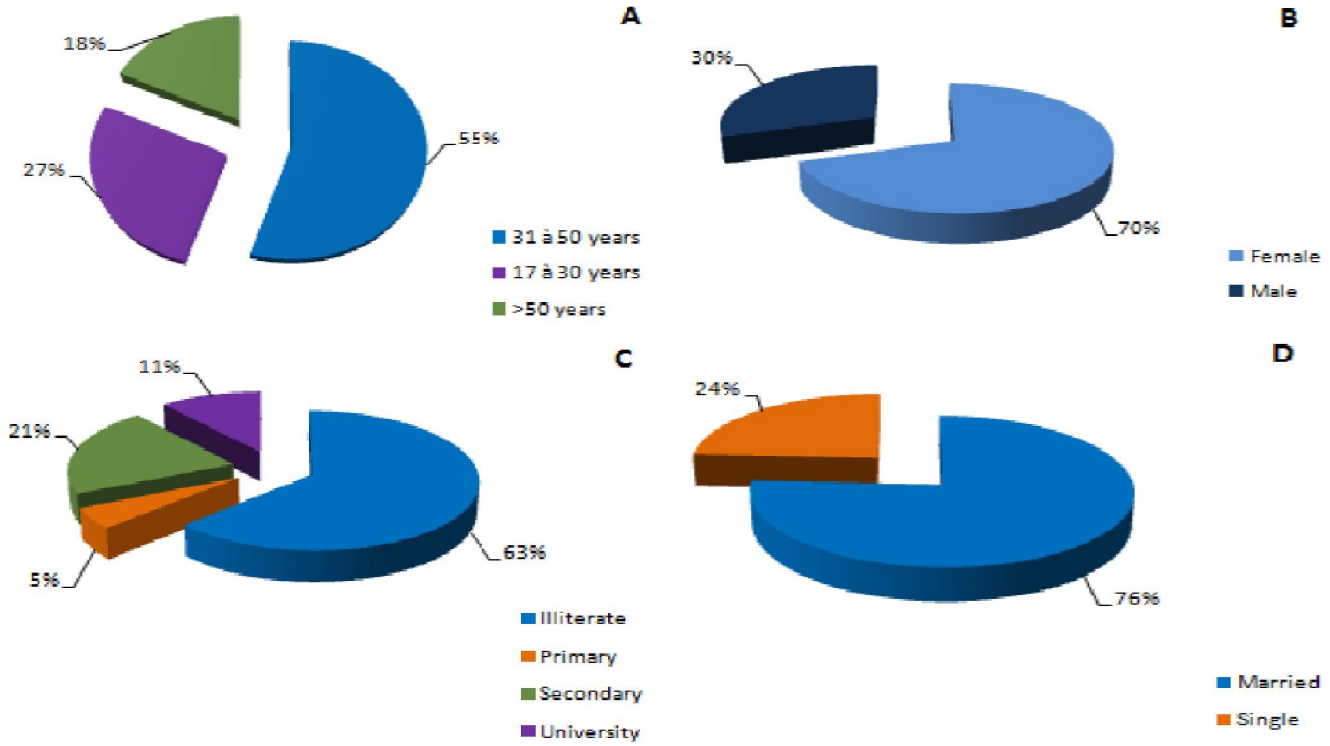

Figure 3 : the use's distribution of medicinal plants according to age (A), sex (B), educational level (C) and family situation (D)

than others.

According to the sex

The use of medicinal plants varies by sex. In fact, 70% of surveyed women use traditional medicine against 30% of the men. These results are similar to other studies carried out in certain zones of Morocco[4] in the region of MechraBelKsiri (Gharb region of Morocco) andEl hafian et al (2014) in the region of Agadir-Ida-Outanane, have shown that women have more knowledge in traditional therapeutic.

According to the educational level

In the study area, the vast majority of users are illiterate with a percentage of 63%. However, people with secondary or university study level, use rarely the treatment by plants. The percentage of use is respectively 21% and 11%. People, whose educational level did not exceed the primary, use very rarely medicinal plants.

The illiteracy rate which is clearly higher in the region can be a real obstacle to local economic development, and can promote the degradation of natural resources.

According to the family situation

The usage frequency of these vegetal resources depends on the family situation of the population. However, the majority of the users are married with a percentage of 76%,because the use of these plants can minimize thecharges required by the doctor and

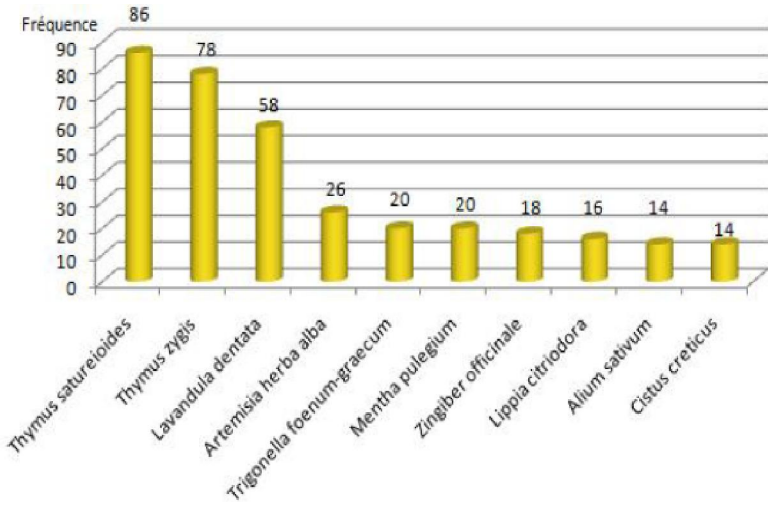

Figure 4 : Most used species

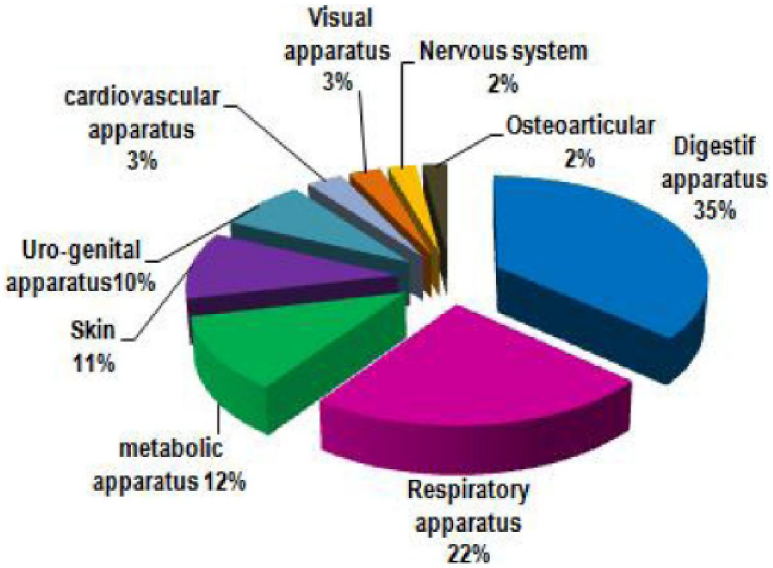

Figure 5 : Distribution ofthe different uses of medicinal plants in the diseasestreatment

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medicaments.

The medicinal plants used in the study area

The mostused medicinal plants

The collected information analysis indicates that among of the 48medicinal species found in the circle AitBaha (Annex 2), 10 plants are the most used (Figure 4). The specie *Thymus satureioides* was used by 86 people,followed by de *Thymuszygis* (78), *Lavanduladentata* (58), *Artemisaherba alba* (26), *Trigoenellafoenumgraecum* (20), *Menthapulegium* (20), *Zingiberofficinale* (18), *Lippiacitriodora* (16),*Aliumsativum* (14) and*Cistuscreticus* (10), while the other plants are less used by the local population.

The three first species (*Thymus satureioides*, *ThymuszygisandLavanduladentata*) with high frequency of use are plants that grow naturally in the study area (Annex 3), the intensive harvest can lead to their disappearance.

The medicinal plants and therapeutic treatments

The ethnobotanical survey revealed that the majority of medicinal species are mainly used against digestive system diseases with a percentage of 35% (Figure 5), followed by respiratory system diseases(22%), disorder metabolic (12%), skin (11%), genito-urinary system (10%), the rest of diseases (visual apparatus, cardiovascular, osteoarticular and nervous system) is represented by less than 4%.

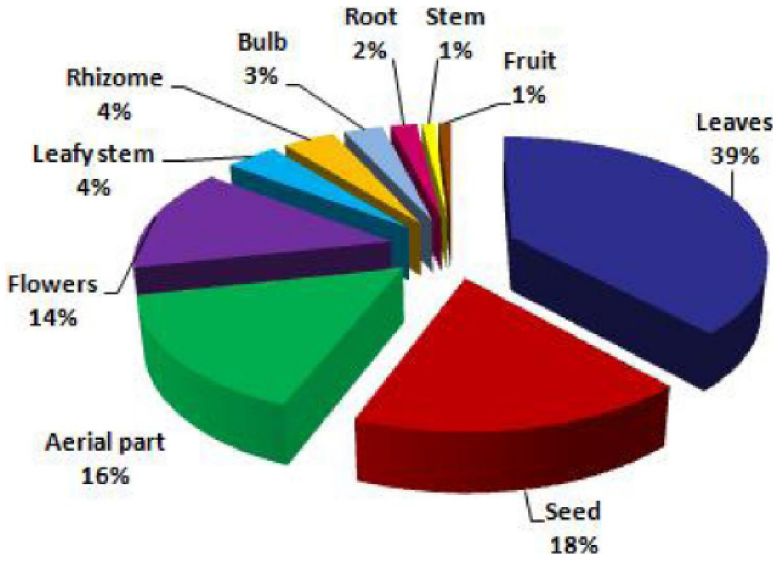

Figure 6 : Used parts of the medicinal plants

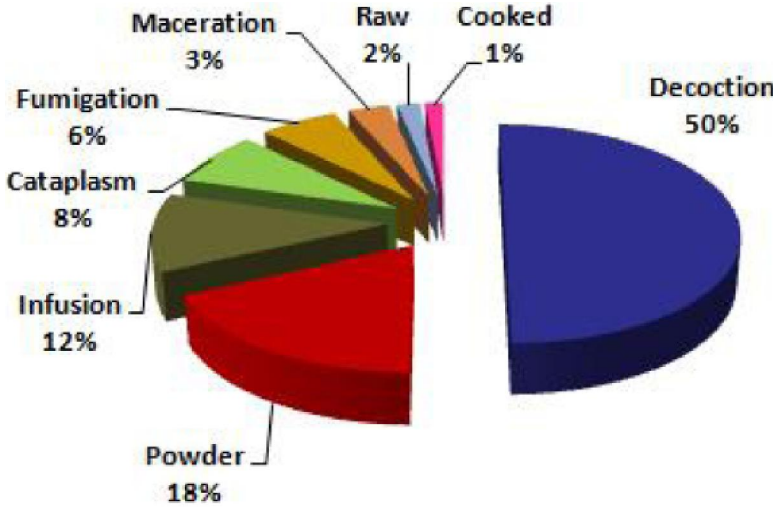

Figure 7 : Distribution of the preparation modes

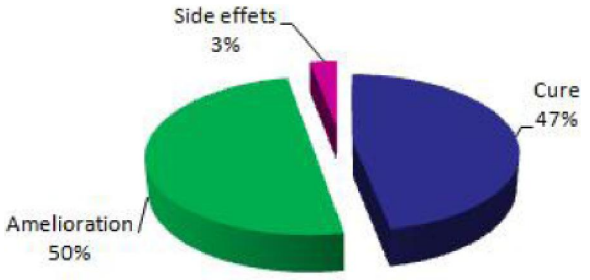

Figure 8: The use of medicinal plants

Figure 9: Care results according to dose

Usedparts of medicinal plants

The obtained results in the circle AitBaha show that the leaves are the most used parts (39 %)(Figure 6), followed by theseeds (18%), aerial parts (16%), then the flowers (14%). the other parts of plants (leafy stems, rhizomes, bulbs, root, stem and fruit) are used occasionally (from 1 to 4%). The high rate of the leaves use can be explained by the harvest ease and by the fact that these organs are exposed to the sun, which gives them virtues and benefactions[6].

Preparation modes

The decoction is the main mode of preparation (50%) (Figure 7), followed by powder preparation (18%), infusion (12%), cataplasm (8%), fumigation (6%), maceration (3%), raw (2%) and cooked (1%). this results show that the local population believe in decoction mode and found it suitable for heating the body and disinfecting the plants[13]. On the other hand, the decoction allows collect the most for active ingredient and attenuates or cancels the toxic effect of certain recipes[14].

Dose

61% of the population use medicinal plants without a dose precision, this may be the main cause of many cases of toxicity (Figure 8). In our survey, no case of toxicity was reported to us. This result may make us think of two explanations, the first, than really the plants hadn't side effects on the health of consumers,the seconde, that the population never made the link between toxicity and plants. We must not forget that 39% of respondents use medicinal plants with the precise doses.

Source of Information regarding the therapeutic use of medicinal plants

The results showed that 50% of interviewed persons refer to the others experiences for preparing recipes, which confirms the transmission of traditional practices from generation to another. While 23% of the population refer to herbalists and 27% of users refer to themselves.

Knowledge of poisonous plants

The survey reveals that 26% for interviewed persons have knowledge on plants toxicity, on the other side, 74% of local population ignores any information on toxic plants and their dangers on health.

Care results

47% of studied population thinks that medicinal plants allow a cure of diseases (Figure 9). While 50% estimate that the use of medicinal plants can just contributing to improvement the health status. However 3% believe that treatment by plants causes side effects.

CONCLUSION

This study allowed us to inventory the medicinal plants used in the circle AitBaha. The frequency of medicinal plant's use was related to profile of respondents. We found that the use of medicinal species is significantly higher among women. Similarly, the marrieds use more medicinal plants than singles.

The Analysis of the results showed that the leaves are the most used part with a percentage of 39%, the decoction is the most practiced preparation mode (50%). The digestive disorders represent the most cited diseases, this explains the intense use of certain plants such *Thymus satureioides, Thymuszygis*and*Lavanduladentata* that are known by the following effects antispasmodic, anti diar-

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rheal, stomachic, etc

The collection method and the intensive use of spontaneous species can contribute to the degradation of plant biodiversity.

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Annex 1: Ethnobotanical survey sheet

1.Age :	□ A1 [17-30] □ A2 [31-50] □ A3 [>50]
2. Profession :	□ Unemployment □ Functionary
3.Family situation :	□ Single □ Married
4.Sex :	□ Male □ Female
5. Level of study :	□ Primary □ Secondary □ Academic □ Illiterate
6.When you feel sick, you adress :	□ To traditional medicine, why: □ Effective □ Less expensive □ drug ineffective
	□ To modern medicine, why: □ Effective □ plants toxicity
If both cases, which is the first?	□ Modern medecine □ Traditional medecine

7.Care results : □ Healing □ Amelioration □ Intoxication □ Side effects
8.Origin of the information : □ Themselve □ Herbalist □ other's experience
9.Do you know of poisonous plants in the region? □ yes□ No

Plant species	Type of plant	Parts used	Mode of preparation	disease

10. Do you use plants with precise doses: □ yes □ No
11. Parts used □ Rhizome □ Stem □ Leaves plus stem □ Tige feuillée □ Flowers □ Fruit □ Aerial Parts □ Bulb □ Seed □ Root.
12.Type of plant □ Spontaneous □ Cultivated □ Imported
13.Types of desease □ Métabolicapparatus □ digestive apparatus□ Respiratory □ Uro-Genital □ Visual
□ Ostéo-articular □ System nervous □ Skin □ Cardio-vascular
14.Mode of preparation □ Infusion □ Decoction □ Cataplasm □ Maceration □ Fumigation □ Powder □ Raw □ Cooked

Annex 2 : Catalogue of the main medicinal plants used by the local population of the circle Ait Baha

Local name (Amazigh)	Scientificname	Local name (Amazigh)	Scientificname
Addad	*Atractylisgummifera*	kalitouss	*Eucalyptus sp*
Aferziz	*Citrulluscolocynthis*	Karwiya	*Carum carvi*
Afzdad	*Inulaviscosa*	Kamoune	*Cuminumcyminum*
Ahsrkna	*Thymus satureioides*	Lharmal	*Peganumharmala*
Alili	*Neriumoleander*	Likama	*Menthavirids*
Ansal	*senecioanteuphorbium*	Louiza	*Lippiacitriodora*
Araar	*Tetraclinisarticulata*	Louz	*Prunus dulcis*
Argan	*Arganiaspinosa*	Mkhinza	*Chenopodiumambrosioides*
Azalimouchen	*Urgineamaritima*	Rayhane	Myrtuscommunis
Azemmour	*Oleaenropaea*	Salmiya	*Salviaofficinalis*
Azoukni	*Thymus zygis*	Shanouj	*Nigellasp.*
Azougar	*Ziziphus lotus*	Skenjbir	*Zingiber officinale*
Babounj	*Matricariachamomilla*	TaghistEr-rummân	*Punicagranatum*
Badiane	*Illicumverum*	Taknarit	*Opuntiaficus-indica*
Besbas	*Foeniculumvulgare*	Temizriya	*Lavandula dentata*
bessla	*Aliumcepa*	Tifidas	*Trigonellafoenumgraecum*
Fliyou	*Menthapulegium*	Tikida	*Ceratoniasiliqua*
Habrchad	*Lepidiumsativum*	Tikiwt	*Euphorbiasp*
Habethlawa	*Pimpinellaanisum*	Tiskert	*Aliumsativum*
Ifzi	*Marrubiumvulgare*	Tiznirt	*Chamaerops humilis*
Igg	*Pistaciaatlantica*	Warkatsidna moussa	*Laurusnobilis*
Irguel	*Cistuscreticus*	Yazir	*Rosmarinusofficinalis*
Iwrmi	*Rutamontana* L.	Za'afranlhôr	*Crocus sativus*
Izri	*Artemisia herba alba*	Zariatlkatane	*Linumusitatissimum*

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Annex 3 : Type of plants (spontaneous, cultivated or imported)

List of spontaneous species

Atractylisgummifera Lavanduladentata Prunusdulcis
Arganiasinosa Marrubiumvulgare Rutamontana
Ceratoniasiliqua Matricariachamomilla Senecioanteuphorbium
Chamaeropshumilis Myrtuscommunis Tetraclinisarticulata
Citrulluscolocynthis Nerium oleander Thymus satuerioides
Cistuscreticus Oleaeuropaea Thymus zygis
Eucalyptus sp Opuntiaficus-indica Urgineamaritima
Euphorbia sp Peganumharmala Ziziphus lotus
Eryngiumilicifolium Pistacia atlantica
Inulaviscosa Pimpinellaanisum
Laurusnobilis Punicagranatum

List of cultivated species list of imported species

Aliumsativum Cuminumcyminum
Aliumcepa Crocus sativus
Artemisia herbaalbaIllicumverum
Chenopodium ambrosioides Linumusitatissimum
Foeniculumvulgare Zingiberofficinale
Lepidiumsativum
Lippiacitriodora
Menthapulegium
Menthavirids
Nigella sp.
Rosmarinusofficinalis
Trigonellafoenumgraecum
Salvia officinalis