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Ethnopharmacological Study of anti-diabetic medicinal plants used in the Middle-Atlas region of Morocco (Sefrou region)

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ABSTRACT

Aim: To conduct an ethnopharmacological survey and to collect some information about antidiabetic plants used in Sefrou region. *Materials and Methods*: This study was carried out from October to December 2012 using a well structured questionnaire elaborated in our laboratory. *Results and Discussion*: The investigations revealed 22 species of plants belonging to 19 families. The decoction of the leaves, fruits and seeds of these plants are the most commonly used while the extracts are taken orally. *Olea europaea L.* and *Salvia officinalis L.* of the families Oleaceae and Lamiaceae respectively, were repeatedly mentioned by the traditional healers as the two mostly used for the management of Diabete Mellitus in the study area. *Conclusion*: There is an urgent need of recording all ethnobotanical and ethnopharmacological information before they are lost and further efforts are needed to more traditional medicine and to develop a new natural medicine.

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1. INTRODUCTION

According to the World Health Organization (WHO) about 65-80% of the world's population in developing countries depends essentially on plants for their primary healthcare due to poverty and lack of access to modern medicine. [1] Moroccan people have a rich and ancient tradition in the field of phytotherapy. [2] There are numerous medicinal plants described for treatment of many diseases and herbal medicine is an integral part of Moroccan culture. Populations are still practicing the art of herbal medicine. The knowledge of the use of medicinal plants and their properties was transmitted from generation to generation. [3] But this knowledge transmission is in danger because of older and younger generation is not always assured.[4] Diabetes mellitus is a metabolic disease characterized by high blood glucose level resulting from defects in insulin secretion, insulin action or both. [5] It is a chronic disorder that affects the metabolism of carbohydrates, fats, proteins and electrolytes in the body, leading to severe complications which are classified into acute, sub-acute and chronic. [6]

In Morocco, some studies have been performed in different areas in order to describe local pharmacopoeia. [7-11] we have proposed in this study to describe the medicinal plants used in treating diabetes especially type 1 and type 2 diabetes mellitus disease.

2. MATERIALS AND METHODS

Sefrou is a walled town, nested in the slopes of the middle Atlas, about 28 kilometers south east of Fez in central Morocco. Agriculture is the main activity in this region. The mountainous terrain is the ideal place for fruit trees, especially cherries. This study was carried out from October to December 2012 using a well structured questionnaire. The set questions contained the diagnosis of diabetes mellitus, the names of plants, methods of preparation, duration of treatment, adverse effects and mode of administration of the plant. Traditional healers and herbalists interviewed consisted of women and men between 35 and 60 years of age with a low qualification. A total of more than 230 persons were interviewed, which included males and females that depended on plants as sources of medicines either for self- medication or for treating others.

3. RESULTS AND DISCUSSION

In this study, we focused mainly on plant species reported by the local people in and around the study area for their medicinal uses. Present data are the general results of the ethnopharmacological survey conducted from October to December (2012). In the present investigation 22 medicinal plants are used for the treatment of Diabetes mellitus (Table 1). Among all the species, *Olea europaea L., Salvia officinalis L., Trigonella foenum-graecum L., Euphorbia echinus Coss. Et Hook., Globularia alypum L., Coriandrum sativum L.*, are commonly used by the local people for the treatment of diabetes. These medicinal plants were mostly useful in local people for their treatment of diabetes.

Fenugreek (*Trigonella foenum-graecum*) is used for diabetes in Manisa. It is cultivated as a spice in Turkey and generally used for producing "pastırma" (pressed meat cured with garlic and other spices). There are many studies regarding antimicrobial and antibacterial effects of fenugreek besides anti-diabetic. In India and China it is used as an anti-diabetic plant. [12-13] The extracts, powder and gum of fenugreek seeds and leaves are reported to have shown anti-diabetic and hypocholesterolemic properties during the clinical trials within animals as well as humans. [14-27]

Generally women (75%) use much more herbal plants than men (25%). Women said that they obtained information about herbal plants from their mothers and grandmothers, traditional healers, their friends and nowadays from television programs. Men obtained

Table 1: Medicinal plants used in Sefrou region for the treatment of Diabetes mellitus

Family	Botanical Name	Vernacular name	Parts used	Antidiabetic recipe	Frequency of use (%)
Alliaceae	*Allium cepa* L.	Al'Bassla	Fruit	The juice of the fruit used for diabetes	3,04
Fabaceae	*Trigonella foenum-graecum* L.	Halba	Seed	Infusion	6,52
	Phaseolus vulgaris	Loubiya khadra	Fruit	Juice de fruit	0,87
	Lupinus albus L.	tirms, foul gnawa	Seed	Powdered seed with honey taken orally	0,87
Rutaceae	*Citrus bigaradia* L. Riss.	Lrange	Fruit; Aerial part	Juice of fruit is taken orally; powder is taken orally with water	7,83
Capparaceae	*Caparis Spinosa* L.	kabbar	Fruit	Decoction	2,17
Lauraceae	*Persea americana* Mill.	Lavocat	Seed	Dried seeds powdered and taken orally with water	0,87
Apiaceae	*Coriandrum sativum* L.	Kesbour	Seed	Infusion	4,35
Sapotaceae	*Argania spinosa* L.	Argane	Seed	Dried seeds powdered	2,61
Globulariaceae	*Globularia alypum* L.	taselgha/Âin lerneb	Flower	flower decoction	5,22
Euphorbiaceae	*Euphorbia echinus* Coss. Et Hook.	ddaghmûs	Fruit	Juice de fruit	6,52
Cactaceae	*Opuntia ficus indica* Mil	Handiya	Flower	Decoction	3,48
Oleaceae	*Olea europaea* L.	Zitoun, Zebbouj	Leaves; flowers	Decoction of Olea leaves with or without salvia leaves and taken orally; powder	26,08
Poaceae	*Phalaris paradoxa* L.	El zwane	Seed	seeded powered with water is taken orally	3,48
Compositae	*Artemisia absinthum* L.	Chiba	Aerial part	Infusion	2,61
	Artemisia herba-alba Asso	Chih	Aerial part	Decoction	3,04
Chenopodiaceae	*Chenopodium ambrosoides* L.	Mkhinza	Leaves, flowers	Herbal infusion made from leaves and flowers	2,61
Apiaceae	*Ammi visnaga* Lam.	Bachnikha	Fruit	Decoction	0,87
Lamiaceae	*Marrubium vulgare* L.	Merriwa	Aerial part	Decoction	2,61
	Salvia officinalis L.	Salmia	Leaves	Decoction	10,87
Verbenaceae	*Aloysia citriodora*	Louiza	Leaves	Decoction or infusion	2,61
Ranunculaceae	*Nigella sativa* L.	Lḥbba saouda,	Seed	Infusion	0,87

their medicinal herbal knowledge from their ancestors, friends, traditional healers and some books. These results showed that women have fundamental role in transmission of traditional medicinal herbal knowledge. People believe that a traditional herbal medicine is safer without side effects than synthetic drugs. Moreover herbals are much cheaper than the medicines sold at pharmacy shops. The people in the rural areas have more accessibility to herbal products.

4. CONCLUSION

Thus many different plants have been used individually or in formulations for treatment of diabetes and its complications. One of the major problems with this herbal formulation is that the active ingredients are not well defined. It is important to know the active component and their molecular interaction, which will help to analyze therapeutic efficiency of the product and also to standardize the product. This study highlighted the abundant knowledge of traditional medicine that is being used for the diabetes treatment by the local people of Sefrou region.

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