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Vasculat plants used in tradional cosmetic by the human population in the plain of the Gharb (Morocco)

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ABSTRACT

In order to perform an analysis and a floristic inventory of medicinal plants used for cosmetic purposes by the human population in the Gharb plain (Morocco) a survey using a questionnaire was performed with a human sample of 1440 people. The results show that 126 species, tidied in 98 Genera and 48 botanical families, were used. Systematically the Rosaceae (10.52 %, Asteraceae (7.89 %), Fabaceae (7 %), the Lamiaceae (7 %), Poaceae (5.26 %) and Solanaceae (4.38 %) are the families most represented. In contrast, 27 families were represented by only one species each.

Moreover, the frequencies of use of different plant parts were as follow: fruit 28.1 %, leaf 20.3 %, seed 10.8 %, entire aerial part 9.3 %, flower 9.3 %, root 4.7% and essential oils 3.9%. The latex and the bark of the plant were also used but with low frequencies.

KEYWORDS

Medicinal Plants;
Cosmetics;
Traditional medicine;
Gharb Plain;
Morocco.

INTRODUCTION

Heal by plants is a therapeutic ancestral millennium and the use of plants as a means to fight against diseases or as means of cosmetics is as old as humanity. Indeed, the history of medicine based on plants, is very long and rich information[1] and the large number of drugs or plant substances continues to grow significantly[2], and the'' World Health Organization (WHO) has recommended that developing countries to initiate programs for the identification, cultivation, preparation and conservation of plants used in traditional medicine to assess the quality and effectiveness of these remedies with modern techniques.

Morever, the Moroccan flora includes about 8000 species[3] and contains one of the highest proportions of endemic vascular plants Euro-Mediterranean. Indeed, over 4500 native or naturalized taxa of this country from 800 to 951 taxa are endemic[4-6]. But, according to Berkat and Tazi (2006)[7], little information is available for some groups of plants in Morocco. The works having studied the use of vascular plants as drug by the local human population are numerous and cover the heal of many parts of the human body. We include those of Salhi et *al*. (2010)[8] and Hseini et Kahouadji (2007)[9]. However, no one of these works has not reserved to a purely cosmetic issue. Thus, the aim of the present work and contribute to bridging of this scientific gap by developing an inventory of plant species, used in part or whole, in cosmetics by the local population of a large plain of Morocco, the Gharb plain.

MATERIALS AND METHODS

Study site

The Gharb plain, figure 1, is presented as an immense alluvial which has geological superficial deposits of the Quaternary age[10]. The attitude is low. the plain covers the provinces of Kenitra and the and Sidi Kacem cities and its area is about 4200 km^2. The climate is Mediterranean tempered by oceanic influences. The population is young nearly 40 % of the population is under 15 years, and nearly 54 % are of working age[11].

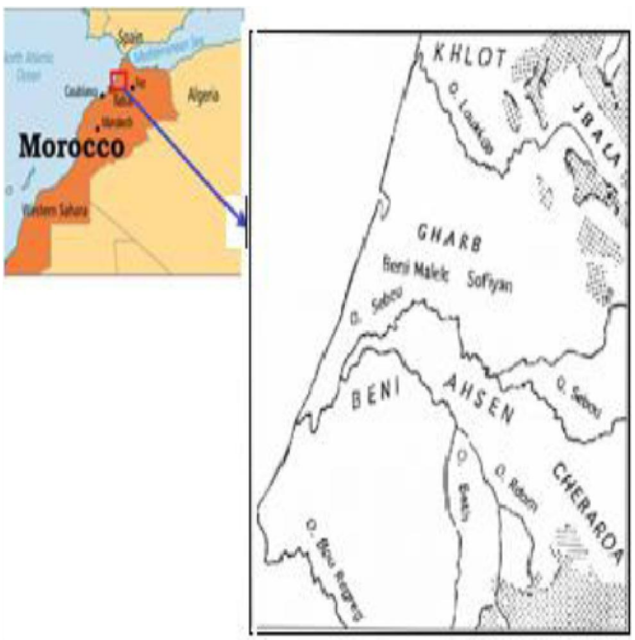

Figure 1 : Plaine of the gharb (Morocco)

Method of data collection

Qualitative research on medicinal plants used in the plain for purpose of the cosmetic is made using 500 question cards (see Appendix) of ethnobotanical surveys. The field campaign was conducted during the year 2012. The systematic identification of some samples collected in the field was carried out in the laboratory of Biodiversity and Natural Resources of the Faculty of Sciences of Kenitra city using the available herbarium and a number of books. Thus, we obtained a scientific understanding of the medicinal and cosmetics flora used by the local population of the study area.

RESULTS AND DISCUSSION

The censused species, their botanical families and the plant parts used in cosmetics are reported in TABLE 1.

TABLE 1 : Species, botanical families and used parts of the plants

plants		Used parts of the plant
Families	**Species**	
Asteraceae	- Arctium lappa L.	Root + Leaf
	- Cynara scolymus L.	Leaf + Flower
	- Helianthis annuus L.	Seed
	- Artemisia absinthium L.	Aerial part
	- Arnica montana L.	Aerial part
	- Calendula officinalis L.	Aerial part
	- Lactuca sativa L.	Leaf
	- Matricaria recutita L.	Flower
	- Artemisia helba-alba Asso.	Aerial part
Apiaceae	- Coriandrum sativum L.	Root + Leaf
	- Docus carota L.	Root
	- Cuminum cyminum L.	Seed
Alliaceae	- Allium porrum L.	Bulb
	- Aloe vera L.	Leaf
	- Allium sativum L.	Bulb
	- Allium cepa L.	Bulb
Arecaceae	- Chamaerops humilis L.	Root
	- Phoenix dactylifera L.	Fruit
Anacaridiaceae	- Mangifera indica L.	Fruit
	- Pistacia lentiscus L.	Leaf + Fruit
Asparagaceae	- Asparagus acutifolius L.	Aerial part
Brassicaceae	- Brassica oleracea capitata L.	Leaf
	- Brassica rapa L.	Aerial part
	- Raphnus sativus L.	Root
Betulaceae	- Corylus avellana L.	Fruit
Boraginaceae	- Borago officinalis L.	Aerial part
Cucurbitaceae	- Cucumis sativa L.	Fruit
	- Cucurbita ficifolia Bouché	Fruit
Caryophilacéaceae	- Saponaria officinalis L.	Root
Capparaceae	- Capparis spinosa L.	Fruit
Cactaceae	- Opuntia ficus indica (L.) Mill.	Stem + Fruit + Oil
Cannabaceae	- Cannabis sativa L.	Seed
Ebenaceae	- Diospyros kai L.	Fruit
Euphorbiaceae	- Ricinus communis L.	Oil
Fabaceae	- Phaseolus vulgaris L.	Seed
	- Ceratonia siliqua L.	Fruit
	- Glycine max (L.) Merr.	Seed + Oil
	- Pterocarpus santalinus L.	Wood
	- Vicia faba L.	Fruit
	- Cicer arietinum L.	Seed
	- Phadeolus vulgaris L.	Seed
	-Trigonella foenum graecum L.	Seed
	- Glucyrrhiza glabra L.	Stem
Fagaceae	- Quercus suber L.	Fruit
Geraniaceae	- Geranium cinereum Cav.	Flower
	- Pelargonium graviolens L.	Leaf + Flower
Irridaceae	- Crocus sativa L.	Bunting
Juglandaceae	- Juglans regia L.	Fruit + Bark

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plants		Used parts of the plant
Families	Species	
Lythraceae	- Lawsonia intermis L.	Leaf
	- Punica granatum L.	Fruit
Lamiaceae	- Thymus pallidus Batt.	Leaf + Flower
	- Thymus broussonetii Boiss.	Leaf + Flower
	- Rosmarinus officinalis L.	Aerial part
	- Marrubium vulgaris L.	Aerial part
	- Oscimum basilicum L.	Leaf
	- Mentha pulegium L.	Leaf
	- Mentha rotundifolia L.	Leaf
	- Lavandula stoechas L.	Leaf + Flower
Lauraceae	- Laurus nobilis L.	Leaf
	- Cinnamonum camphora L.	Wood
	- Nerium oleander L.	Latex
	- Cinnamonum verum Persl.	Bark
	- Persea gratissima Gaertn	Fruit
Linaceae	- Linum usitatissimum L.	Seed + Oil
Musaceae	- Musa coccinea Andews	Fruit
Myrtaceae	- Syzygium aromaticum L.	Flower + Fruit
	- Eucalyptus sp	Leaf
	- Myrtus communis L.	Leaf
Moraceae	- Ficus carica L.	Fruit + Latex
Malvaceae	- Altheae officinalis L.	Aerial part
	- Malva sylvestris L.	Aerial part
	- Theobroma cacao L.	Fruit
	- Hibiscus sabdariffa L.	Flower
Oleaceae	- Jasminum nudiflorum Lindl.	Flower + Oil
	- Olea europea L.	Flower + Oil
Papaverceae	- Papaver rhoes L.	Flower + Fruit
	- Argenum mexicana L.	Latex
Poaceae	- Avena sativa L.	Seed
	- Zea mais L.	Seed
	- Hordeum vulgare L.	Seed
	- Saccharum officinarum L.	Juice
	- Arundo donax L.	Rhizome
	- Oryza sativa L.	Seed
	- Zoysia matrella L.	Rhizome
Phytolaccaceae	- Vitis vinifera L.	Fruit + Leaf
Polygonaceae	- Rumex acetosa L.	Leaf
Plantaginaceae	- Plantago psyllium L.	Leaf
Pinaceae	- Cedrus atlantica Manetti	Fruit + Oil
	- Pinus halepensis (Miller)	Leaf
Urticaceae	- Urtica dioica L.	Aerial part
Rutaceae	- Citrus paradisis Macfodyen	Fruit
	- Citrus aurantium amara L.	Fruit
	- Citrus limonum Risso	Fruit
Rosaceae	- Eriobotrya japonica (Thunb.)	Leaf + Fruit
	Lindl	Fruit
	- Pyrus communis L.	Seed
	- Prunus persica (L.) Batsch	Fruit
	- Fragaria anassa L.	Flower
	- Rosa damascena Mill.	Fruit
	- Prunus armeniaca L.	Fruit
	- Amygdalus communis L.	Fruit
	- Pyrus malus L.	Flower
	- Rosa rubiginosa L.	Fruit
	- Prunus cerasus L.	Fruit = receptacle +
	- Cydonia oblonga Miller	seed
	- Mesplius germanica L.	Fruit
Rhamnnaceae	- Ziziphus lotus L. (Desf.)	Fruit
Simmondsiaceae	- Simmondsia chinensis L.	Oil
Sapotaceae	- Argania spinosa	Fruit + Oil
Solanaceae	- Solanum melongena L	Fruit
	- Capsicum annuum L.	Fruit
	- Nicotiana tabacum L.	Leaf
	- Lycopersicon esculentum Mull.	Fruit
	- Solanum tuberosum L.	Tuber
Theaceae	- Camellia sinensis (L.) Kuntze	Leaf
Tiliaceae	- Tilia palatyphyllos Scop	Leaf
	- Tilia cordata Mill.	Leaf
Verbenaceae	- Verbena officinalis L.	Leaf
Zygophyllaceae	- Peganum harmala L.	Seed
Zingiberaceae	- Curcuma longa L.	Rhizome
	- Zingiber officinale Rosc.	Rhizome
Pédaliacées	Sesamum indicum L.	Seed
Cupressaceae	Tetraclinis articulata L.	Leaf
Ranunculaceae,	Nigella damassene L.	Seed
Thyméléacées	Daphne gnidium L.	Leaf
Tamaricacées	Tamarix gallica L.	Leaf gall
Actinidiaceae	Actinidia Chinensis Planch	Fruit

As the TABLE 1 shows, 126 species are used by the studied population for cosmetic purposes. These species are arranged in 110 genera and 54 Botanical families. The botanical families most represented were as follow: Rosaceae (10.52 %), Asteraceae (7.89 %), Fabaceae (7.01 %), Lamiaceae (7.01 %), Poaceae (5.26 %) and Solanaceae (4.38 %). The Asteraceae family, which is the most species-rich in the list of botanical families in Morocco[12] is ranked in second place. In addition, 33 families, or 61.11 % of the families reported, were represented systematically by only one species each. While, that grouping 2, 3 or 4 species were 13.15 %. Thus, the most represented families were also those that group the largest number of genera (44), while 44 families have 1 or 2 genera.

In addition, in species used 17.54% are spontaneous local, 7 % are spontaneous of other regions of Morocco, 52.63 % are cultivated, 2.7 % are imported, one species is a Moroccan endemic species.

By comparing these results with those of other works conducted in other regions of Morocco and studing the use of herbal medicines and the cosmetics plants, the censused flora is as rich and diverse. Note that, in Morocco, the species richness of plants used in ethnobotany is highly variable from one region to another. Indeed, in the region of the town of Taounate, El-Hilaly and colleagues (2003)[5] have censused 102 species belonging to 48 families; in the region of the town of Taza, Khabbachi and colleagues (2012) [13] have identified 73 species belonging to 39 families; in the region and the city of Rabat, Hseini and colleagues (2007)[14] have reported 280 species divided into 77 families.

Also note that a large number of species or families of botanical species are known for their use in the cosmetic industry. Indeed, it is known that a large number of species of the Rosaceae family have medicinal value. Other botanical families frequently cited in geographic area studied are known by their medicinal value including Asteraceae[15] and Fabaceae[16].

Concerning the parts of the plant that are used for any purpose cosmetic confused, the result were as follow: fruit 28.1 %, leaf 20.3 %, seed, 10.8 %, entire aerial part 9.3 %, flower 9.3 %, 4.7 % and root essential oils 3.9 %. Latex and bark of the plant are also used but with low frequency. So, the aerial part (leaves, fruits, seeds, flowers) is best used in cosmetics by the human population studied. This result is consistent with other studies conducted in other regions of Morocco especially those of Ennabili et *al*. (2000, 2006)[17,18], Camejo-Rodrigues et *al*. (2003)[19], El-Hilaly et *al*. (2003)[5] and Mehdioui Kahoudji (2007)[20], González-Tejero et *al*. (2008)[21] and Parada et *al*. (2009)[22].

CONCLUSION

In the studied plain we have censused 126 species used in cosmetics. These species are distributed 98 genera and 48 botanical families. The Families most represented were: Rosaceae (10.52 %), Asteraceae (7.89 %), Fabaceae (7 %), the Lamiaceae (7 %), Poaceae (5.26 %) and Solanaceae (4.38 %). The main families were also those who group a large number of used genera. Many identified species, genera or botanical families are known by their use in the cosmetic industry. Moreover, 52.63 % of the plants used are locally grown. Others are spontaneous local or spontaneous of other regions of Morocco, or introduced or imported in Morocco. One species is Moroccan endemic. Adding that the frequency of use of different parts of the plant were as following: the fruit 28.1 %, leaf 20.3 %, seed, 10.8 %, the entire aerial part 9.3 %, flower 9.3 %, 4.7 % and root essential oils 3.9 %. The latex and bark of the plant were used with a low frequency

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