

Diversity of Medicinal Plants in the Biospherical Reservation Areas of Iran

(A Case Study of the protected area of Miankaleh)

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Abstract: Awareness of people concerning the side effects of chemical drugs has caused an increasing interest in traditional medicine. This study was carried out to gather and identify medicinal plants, their curative effects and the part of them which is used from the reservation area of Miankaleh. The region under study has an area of 68800 hectares situated 12 kilometers north of the city of Behshahr and northwest of the city of Gorgan. During numerous visits to the area, plants were gathered and, after their identification using specialized references of medicinal plants, the part used and the curative effects of the plants were determined. Results obtained showed that out of a total of 43 families, 125 genera, and 155 species found in the region, 33 families, 52 genera, and 61 species (39% of all the species) belonged to medicinal plants, among which the class Asteraceae with 6 species and the class Chenopodiaceae with 5 species had the most medicinal species. The most used parts of the plants were the leaves with 31%, the whole plants with 19%, and the roots with 15%.

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1. Introduction

Since ancient times, plants have been one of the first and most available resources usable for treating illnesses, and throughout history there has always been a close relationship between man and plants, and the medicinal effects of plants and their uses have been known by everybody (UNESCO, 1996). Today, chemical medicines, because of their harmful and irreversible effects on people, are slowly being replaced by medicines extracted from plants (Banerjee, 2002). More than 422000 species of flowering plants have been reported from all over the world about 5000 species of which are used for medicinal purposes. There are about 8000 plant species out of which 569 genera and 2300 species are medicinal (Mozaffarian, 2005).

There is a considerable and growing interest in herbal medicines in the world since, according to

international statistics, the value of trade in herbal medicines enjoys a yearly growth of 12- 15% de Silva (1997). It is worth mentioning that in Germany, which is a big center of chemical drugs production, more and more herbal medicines are used by patients and prescribed by doctors (Pande et al., 2004). Medicinal plants are so important that pharmaceutical experts search among plants to find medicines of the 21st century and these experts believe that plants are the solution to medical problems of the future. Use of traditional and medicinal plants in developing countries is widely attracting attention as the main basis for maintaining health (Nazir et al, 2010). For this same reason, identification, preservation, and sustainable management of these valuable resources are necessary (Hamilton 2003). This study was carried out with the purpose of directly accessing herbarium samples, identifying the medicinal plants of the region, finding

out the parts of the plants used, and what illnesses they are used for.

2. Materials and Methods

2.1. The Characteristics of the Region Studied

The protected region of Miankaleh, which consists of two wet and dry ecosystems, has an area of 68800 hectares, 18000 hectares of which belong to the arid part and the rest to the wetland part. The region is 60 kilometers long and its width varies from 5 to 12 kilometers. Miankaleh is 12 kilometers north of Behshahr and northwest of Gorgan, with a longitude of 53° 35' 54.2" east and a latitude of 36° 45' 64.55" north and an altitude of 21-22 meters below sea level, at the extreme southeast of the Mazandaran Sea (the Caspian Sea). To the north of Miankaleh lies the Caspian Sea and to the south and to the east, there is the Gulf of Gorgan.

Miankaleh consists of two wet (the Gorgan Gulf and the Miankaleh wetlands) and dry ecosystems, includes a complex of beaches, marshes, pools and lowlands. It is a suitable place for various plant species due to its unique features as a habitat, and is the only remaining one of the wooded coastal and wetland types of the coast of the Caspian Sea.

2.2. Climate

Climate is the result of various elements of weather, is formed after a long time in adaptation to the geographical position of each region, and plays an important role in relation to the renewable resources of the region. By acquiring a complete awareness of the capacities and limitations the climatic factors impose on each region, we can make optimal use of these resources. The weather in this region is affected by the climate of the southern plains and is considered wet temperate, according to climate classification.

2.3. Soil

The soil in the region is alkaline and it has a light (sandy or sandy silt) and deep texture. The available phosphorous is low to medium. The land area in this region is composed of low sand dunes and seaside beaches with a little to medium expanse of rolling lands. In areas near the coast, the topsoil is salty due to the salty sea water which causes the establishment of halophytic plants.

2.4. The Geomorphology of the Region

The coastal provinces of Mazandaran and Gilan were formed during the Quaternary and after the glaciation periods with the substantial decrease in the water level of the Caspian Sea. The formations in this region are limited to the Quaternary and include sediments relating to the Cenozoic era. Sediments in the region are sandy, calcareous, fine-grained, contain a little clayey soil, and are completely different from the sediments in Gorgan, which contain mineral clay soils.

2.5. The Vegetative Cover of the Region

In general, life forms in various plant communities are different from each other, and in fact it is this very difference that forms the basis of the structure of plant communities. In all, 179 species and sub-species were identified in the wildlife protected area of Miankaleh, most of which belong to the classes Asteraceae, Poaceae, and Fabaceae. Many of the classes found in the region have only one genus and one species. The dominant plants in the wildlife protected area of Miankaleh belong to the Iranian-Turani core and type which makes up 26.1 percent of the plants in the region. The European, the Siberian, and the Mediterranean types comprise 7.5, 3.7 and 26.1 percent of the plants in the region, respectively.

3. Methodology

The plant samples were gathered from the region and identified at the herbarium of the Agricultural Sciences and Natural Resources University of Sari. Information such as the Persian names, the parts of the plants used, and usages of the plants was obtained by using references found at the university library. This information is shown in table 1.

4. Discussion and Conclusions

Results of the study showed that, with reference to the floristic list, there are 43 classes, 125 genera and 155 species in the region, out of which 33 classes, 52 genera and 61 species belong to medicinal plants (Zargari, 1985-1991). The classes Asteraceae with 6 species and Chenopodiaceae with 5 species included the most number of medicinal species. The parts of the plants used most were the leaves (in 27 species), the whole plant (16 species), and the roots (13 species). The other parts used in the plants mentioned were seeds, bark, flowers, flower bearing browses, tubers, rhizomes, mental, and tree buds (Prajapati, 2003).

Table 1. The Plant Parts Used in the Species Present in the Protected Area of Miankaleh

Se. No	Scientific Name	Class	Form	The Part Used
1	<i>Heliotropium europaeum</i>	Boraginaceae	Tr	Leaves, flower bearing browses, seeds
2	<i>Cirsium arvense</i>	Compositae	Tr	Roots
3	<i>Artemisia annua</i>	Compositae	Tr	Aerial parts
4	<i>Anthemis cotula</i>	Compositae	He	The whole plant
5	<i>Xanthium spinosum</i>	Compositae	Tr	The whole plant
6	<i>Xanthium strumarium</i>	Compositae	Tr	The whole plant
7	<i>Cichorium intybus</i>	Compositae	He	The whole plant especially the leaves and the roots
8	<i>Chenopodium botrytus</i>	Chenopodiaceae	Ch	flower bearing browses
9	<i>Chenopodium albom</i>	Chenopodiaceae	Tr	Leaves , seeds
10	<i>Chenopodium murale</i>	Chenopodiaceae	Tr	Leaves
11	<i>Salsola kali</i>	Chenopodiaceae	Tr	The whole plant
12	<i>Salicornia herbacea</i>	Chenopodiaceae	Tr	Sap
13	<i>Capsella Bursa-pastoris</i>	Cruciferae	Tr	The whole plant
14	<i>Convolvulus arevensis</i>	Convolvulaceae	Tr	The whole plant
15	<i>Cyperus rotundus</i>	Cyperaceae	Cr	Roots ,tubers
16	<i>Stellaria media</i>	Caryophyllaceae	Tr	The whole plant
17	<i>Euphorbia turcomanica</i>	Euphorbiaceae	Tr	Leaves
18	<i>Granium rotundifolium</i>	Geraniaceae	He	Stem
19	<i>Erodium cicutarium</i>	Geraniaceae	Tr	Seeds
20	<i>Cynodon dactylon</i>	Gramineae	Cr	The whole plant
21	<i>Phragmites australis</i>	Gramineae	He	Rhizomes ,roots
22	<i>Hypericum perforatum</i>	Hypericaceae	He	Flower bearing browse
23	<i>Linum album</i>	Linaceae	Ch	Seeds
24	<i>Mentha pulegium</i>	Labiataeae	Tr	The whole plant
25	<i>Marrubium vulgae</i>	Labiataeae	He	The whole plant
26	<i>Lycopus europaeus</i>	Labiataeae	He	Shoots
27	<i>Malva silvestris</i>	Malvaceae	Cr	Leaves ,Flowers
28	<i>Malva neglecta</i>	Malvaceae	Cr	Flowers
29	<i>Morus alba</i>	Moraceae	He	Leaves, Bark ,Roots
30	<i>Ficus carica</i>	Moraceae	Ph	Sap, Stem
31	<i>Oxalis corniculata</i>	Oxalidaceae	Tr	The whole plant
32	<i>Anagalis arvensis</i>	Primulaceae	Tr	The whole plant
33	<i>Samolus valerandi</i>	Primulaceae	Tr	Leaves
34	<i>Rumex acetosella</i>	Polygonaceae	Ch	Leaves
35	<i>Rumex crispus</i>	Polygonaceae	Ch	Leaves ,Roots
36	<i>Polygonum hydropiper</i>	Polygonaceae	Cr	The whole plant
37	<i>Portulaca oleraceae</i>	Portulacaceae	Tr	Shoots
38	<i>Plantago psyllium</i>	Plantaginaceae	Tr	Leaves
39	<i>Plantago major</i>	Plantaginaceae	Cr	Leaves , Roots , Seed
40	<i>Plantago lanceolata</i>	Plantaginaceae	Tr	Leaves ,Roots ,Seeds
41	<i>Punica granatum</i>	Punicaceae	Ph	The whole plant ,Sap
42	<i>Ranunculus sceleratus</i>	Ranunculaceae	Tr	Sap
43	<i>Ranunculus muricatus</i>	Ranunculaceae	Tr	Sap
44	<i>Paliurus spina christi</i>	Rhamnaceae	Tr	Roots ,Leaves
45	<i>Potentilla reptance</i>	Rosaceae	Cr	Rhizomes, Roots, Leaves
46	<i>Mespilus germanica</i>	Rosaceae	Ph	Fruit, Leaves
47	<i>Crataegus sp.</i>	Rosaceae	Ph	Flower , Bark
48	<i>Ailanthus altissima</i>	Simarubaceae	Ph	Bark, Roots

49	<i>Salix alba</i>	<i>Salicaceae</i>	Ph	<i>Bark, Branches, Leaves mental</i>
50	<i>Datura stramonium</i>	<i>Solanaceae</i>	Tr	<i>Leaves, Seeds</i>
51	<i>Solanum nigrum</i>	<i>Solanaceae</i>	Tr	<i>Leaves, flower bearing browses</i>
52	<i>Pimpinella anisum</i>	<i>Umbelliferae</i>	Ch	<i>Fruit</i>
53	<i>Foeniculum vulgare</i>	<i>Umbelliferae</i>	He	<i>Roots, Leaves, Fruit</i>
54	<i>Urtica dioica</i>	<i>Urticaceae</i>	Ch	<i>Leaves, Roots, Sap</i>
55	<i>Urtica urens</i>	<i>Urticaceae</i>	Ch	<i>Shoots, Roots</i>
56	<i>Verbena officinalis</i>	<i>Verbenaceae</i>	He	<i>Shoots</i>
57	<i>Viola odorata</i>	<i>Violaceae</i>	Cr	<i>The whole plant</i>
58	<i>Ulmus minor</i>	<i>Ulmaceae</i>	Ph	<i>Secondary, bark</i>
59	<i>Celtis australis</i>	<i>Ulmaceae</i>	Ph	<i>Leaves, Roots, Leaf buds</i>
60	<i>Peganum harmala</i>	<i>Zygophyllaceae</i>	Tr	<i>Seeds</i>
61	<i>Tribulus terrestris</i>	<i>Zygophyllaceae</i>	Tr	<i>Roots, Fruit, Leaves</i>

Cr: Criptophyte, Ch: Chomophyte, Ph: Phanerophyte, Tr: Trophyt, He: Hemophytee

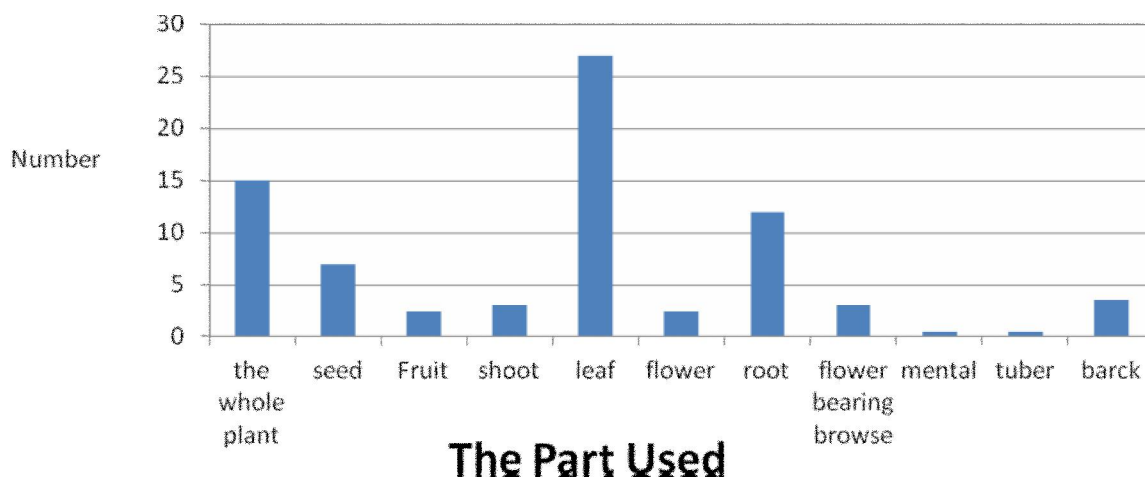


Figure 1. Parts of plants used from the species present in the protected area of Miankaleh.

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