

Study of Iranian Biospherical Reservation Areas for Medicinal Plants Diversity

Esmail Yasari, Abed Vahedi

Abstract—The 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. 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%.

Keywords—Boispherical Reservation Area, Medicinal Plants, Miankaleh, Traditional medicine

I. INTRODUCTION

PLANTS have been one of the first and most available resources usable for treating illnesses, since ancient times [6].; 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 [10]. Today, chemical medicines, because of their harmful and irreversible effects on people, are slowly being replaced by medicines extracted from plants [1]. More than 422000 species of flowering plants have been reported from all over the world [11] about 5000 species of which are used for medicinal purposes [12]. There are about 8000 plant species out of which 569 genera and 2300 species are medicinal [4]. 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% [2]. 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 [9]. 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 [5] use of traditional and medicinal plants in developing countries is widely attracting attention as the main basis for

maintaining health (UNESCO, 1996) [10]. For this same reason, identification, preservation, and sustainable management [8] of these valuable resources are necessary. 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.

II. MATERIALS AND METHODS

A. 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 [7].

B. 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 [7].

C. 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 [7].

Esmail Yasari is Assistant Prof. University of Payame Noor, Sari, Iran. (e_yassari@yahoo.com)

Abed Vahedi is with Department of Agronomy and Plant Breeding, Faculty of Agricultural and Natural Resources, Islamic Azad University, Qaemshahr Branch, Iran (abedvahedy@gmail.com)

D. 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 [7].

E. 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 belongs 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 [7].

III. 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 tables 1 and 2.

IV. 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. 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.

TABLE I THE PLANT PARTS USED IN THE SPECIES PRESENT IN THE PROTECTED AREA OF MIANKALEH

| Scientific Name | Class | The Part Used |
|--------------------------------|-----------------|-----------------|
| <i>Heliotropium europaeum</i> | Boraginaceae | Leaves, seeds |
| <i>Cirsium arvense</i> | Compositaeae | Roots |
| <i>Artemisia annua</i> | Compositaeae | Aerial parts |
| <i>Anthemis cotula</i> | Compositaeae | The whole plant |
| <i>Xanthium spinosum</i> | Compositaeae | The whole plant |
| <i>Xanthium strumarium</i> | Compositaeae | The whole plant |
| <i>Cichorium intybus</i> | Compositaeae | The whole plant |
| <i>Chenopodium botrytus</i> | Chenopodiaceae | Flower |
| <i>Chenopodium album</i> | Chenopodiaceae | Leaves, seeds |
| <i>Chenopodium murale</i> | Chenopodiaceae | Leaves |
| <i>Salsola kali</i> | Chenopodiaceae | The whole plant |
| <i>Salicornia herbacea</i> | Chenopodiaceae | Sap |
| <i>Capsella Bursa-pastoris</i> | Cruciferaeae | The whole plant |
| <i>Convolvulus arevensis</i> | Convolvulaceae | The whole plant |
| <i>Cyperus rotundus</i> | Cyperaceae | Roots, tubers |
| <i>Stellaria media</i> | Caryophyllaceae | The whole plant |
| <i>Euphorbia turcomanica</i> | Euphorbiaceae | Leaves |
| <i>Granium rotundifolium</i> | Geraniaceae | - |
| <i>Erodium cicutarium</i> | Geraniaceae | Seeds |
| <i>Cynodon dactylon</i> | Gramineae | The whole plant |
| <i>Phragmites australis</i> | Gramineae | Rhizomes, roots |
| <i>Hypericum perforatum</i> | Hypericaceae | Flower |
| <i>Linum album</i> | Linaceae | Seeds |
| <i>Mentha pulegium</i> | Labiataeae | The whole plant |
| <i>Marrubium vulgare</i> | Labiataeae | The whole plant |
| <i>Lycopus europaeus</i> | Labiataeae | Shoots |
| <i>Malva silvestris</i> | Malvaceae | Leaves, Flowers |
| <i>Malva neglecta</i> | Malvaceae | Flowers |
| <i>Morus alba</i> | Moraceae | The whole plant |
| <i>Ficus carica</i> | Moraceae | Sap, Stem |
| <i>Oxalis corniculata</i> | Oxalidaceae | The whole plant |
| <i>Anagalis arvensis</i> | Primulaceae | The whole plant |
| <i>Samolus valerandi</i> | Primulaceae | Leaves |
| <i>Rumex acetosella</i> | Polygonaceae | Leaves |
| <i>Rumex crispus</i> | Polygonaceae | Leaves, Roots |
| <i>Polygonum hydropiper</i> | Polygonaceae | The whole plant |
| <i>Portulaca oleraceae</i> | Portulacaceae | Shoots |
| <i>Plantago psyllium</i> | Plantaginaceae | Leaves |
| <i>Plantago major</i> | Plantaginaceae | The whole plant |
| <i>Plantago lanceolata</i> | Plantaginaceae | The whole plant |
| <i>Punica granatum</i> | Punicaceae | The whole plant |
| <i>Ranunculus sceleratus</i> | Ranunculaceae | Sap |
| <i>Ranunculus muricatus</i> | Ranunculaceae | Sap |
| <i>Paliurus spina christi</i> | Rhamnaceae | Roots, Leaves |
| <i>Potentilla reptance</i> | Rosaceae | The whole plant |
| <i>Mespilus germanica</i> | Rosaceae | Fruit, Leaves |
| <i>Crataegus sp.</i> | Rosaceae | Flowers, Bark |
| <i>Ailanthus altissima</i> | Simarubaceae | Bark, Roots |
| <i>Salix alba</i> | Salicaceae | The whole plant |
| <i>Datura stramonium</i> | Solanaceae | The whole plant |
| <i>Solanum nigrum</i> | Solanaceae | The whole plant |
| <i>Pimpinella anisum</i> | Umbelliferaeae | The whole plant |
| <i>Foeniculum vulgare</i> | Umbelliferaeae | The whole plant |
| <i>Urtica dioica</i> | Urticaceae | The whole plant |
| <i>Urtica urens</i> | Urticaceae | Shoots, Roots |
| <i>Verbena officinalis</i> | Verbenaceae | Shoots |
| <i>Viola odorata</i> | Violaceae | The whole plant |
| <i>Ulmus minor</i> | Ulmaceae | Secondary bark |
| <i>Celtis australis</i> | Ulmaceae | The whole plant |
| <i>Peganum harmala</i> | Zygophyllaceae | Seeds |
| <i>Tribulus terrestris</i> | Zygophyllaceae | The whole plant |

TABLE II
USAGES OF THE MEDICINAL PLANTS PRESENT IN
THE REGION

| Scientific Name | Local Usage |
|--------------------------------|--|
| <i>Heliotropium europaeum</i> | Antibilious, antifebrile, menstruation promoter, removes kidney stones, effective against helminth |
| <i>Circium arvense</i> | Tonic, diuretic, appetizer, cure for skin diseases |
| <i>Artemisia annua</i> | Stomach tonic, cure for stomach ache and digestive problems, diuretic |
| <i>Anthemis cotula</i> | Carminative, anti-spasm, menstruation promoter, antifebrile, effective against worms, healer |
| <i>Zanthium spinosum</i> | Diuretic, scrofula, healer, astringent |
| <i>Zanthium strumarium</i> | Effective against worms, tonic, appetizer, sedative, cure for cancer |
| <i>Cichorium intybus</i> | Stomach tonic, diuretic, blood purifier, purgative, antibilious, antifebrile, cure for gout |
| <i>Chenopodium botrys</i> | Asthma reliever, expectorant, anti-spasm, tonic |
| <i>Chenopodium album</i> | Diuretic, purgative, tranquilizer, cure for hemorrhoids, hair loss prevention |
| <i>Chenopodium murale</i> | Cure for worms |
| <i>Salsola kali</i> | Purgative, diuretic, cure for scurvy |
| <i>Salicornia herbacea</i> | Tonic, cure for scurvy, blood purifier, diuretic, cure for malaria |
| <i>Capsella bursa pastoris</i> | Stops bleeding, cure for skin inflammation, epilepsy, and nervous disorders |
| <i>Convolvulus arvensis</i> | Purgative, antibilious, healer |
| <i>Cyperus rotundus</i> | Roots, tuber |
| <i>Stellaria media</i> | Tonic, diuretic, mild astringent, cure for palpitation and disorders of the respiratory system |
| <i>Euphorbia turcomanica</i> | Cure for the flu |
| <i>Granium rotundifolium</i> | Diuretic, astringent |
| <i>Erodium cicutarium</i> | Astringent, stops bleeding, stops the bleeding of the uterus |
| <i>Cynodon dactylon</i> | Cure for vomiting and epilepsy, expectorant, cure for gallstone and diseases of the liver, refresher |
| <i>Phragmites australis</i> | Blood purifier, diuretic, stops milk production in breast feeding women |
| <i>Hypericum perforatum</i> | Tonic, digestive, calms nerves, diuretic, cure for the flu, astringent, cure for worms, appetizer |
| <i>Linum album</i> | Cure for the flu, stops coughing, stops stomach-ache, expectorant |
| <i>Mentha pulegium</i> | Ant flatulence, solvent, expectorant, asthma, gout, promotes menstruation, removes skin spots |
| <i>Pimpinella anisum</i> | Stomach tonic, tonic for the digestive system, pain in one side of the head, coughs, and asthma |
| <i>Foeniculum vulgare</i> | Diuretic, appetizer, menstruation promoter, tonic and stomach tonic, sedative |
| <i>Urtica dioica</i> | Diuretic, helps digestion, stops bleeding, cures diabetes, increases milk secretion |
| <i>Urtica arens</i> | Astringent, diuretic |
| <i>Verbena officinalis</i> | Astringent, tonic, antifebrile, anti-spasm |
| <i>Viola odorata</i> | Softener, weak expectorant, diaphoretic, sore throat, chest diseases, the flu, and whooping cough |
| <i>Tribulus terrestris</i> | Tonic, appetizer, cure for skin problems, asthma, and hemorrhoids, blood purifier |

| Scientific Name | Local Usage |
|-------------------------------|--|
| <i>Marrubium vulgare</i> | Stomach tonic, appetizer, tonic, expectorant, heart tonic, cure for pussy wounds and for malaria |
| <i>Lycopus europaeus</i> | Astringent, antifebrile, cure for bleeding |
| <i>Malva silvestris</i> | Softener, sedative, diuretic, cure for chest problems |
| <i>Malva neglecta</i> | Cure for vaginal inflammation, pesticide |
| <i>Morus alba</i> | Diuretic, antifebrile, healer, purgative, cure for diseases of the chest |
| <i>Ficus carica</i> | Purgative, cure for corn, wart, and edema |
| <i>Oxalis corniculata</i> | Appetizer, cure for hemorrhoids, dysentery, simple diarrhea, and skin disorders, cure for wart |
| <i>Anagalis arvensis</i> | Expectorant, cure for insect bite, mental problems, chest diseases, and disorders of the urinary tract |
| <i>Rumex acetosella</i> | Cure for insufficient activity of the urinary tract, and eruption and papula on the face |
| <i>Rumex crispus</i> | Cure for anemia, appetizer, diuretic, astringent |
| <i>Polygonum hydropiper</i> | Stops bleeding, diuretic, tonic, healer, gives a red hue to the face |
| <i>Portulaca oleracea</i> | Diuretic, cures scurvy, antifebrile, purifies blood, reduces thirst |
| <i>Plantago psyllium</i> | Heals wounds and cuts, purgative, cure for constipation, chronic flu, dysentery |
| <i>Plantago major</i> | Astringent and softener, blood purifier, tranquilizer, cure for asthma and tooth-ache |
| <i>Plantago lanceolata</i> | Astringent and softener, blood purifier, tranquilizer, cure for asthma, tooth-ache |
| <i>Punica granatum</i> | Simple diarrheas, cure for weak stomach, lack of appetite, nausea, anemia, tiredness, wounds |
| <i>Ranunculus sceleratus</i> | Cure for dyspnea, tuberculosis, jaundice, scrofula, intermittent malarial fever |
| <i>Ranunculus muricatus</i> | Antifebrile, cure for asthma and gout |
| <i>Paliurus spina christi</i> | Astringent tonic, diuretic, cure for the flu, diarrhea, lowers cholesterol |
| <i>Potentilla reptance</i> | Astringent, tonic for the digestive system, blood purifier, cure for diarrhea and sore throat |
| <i>Mespilus germanica</i> | Cure for simple diarrheas, astringent, stomach tonic, increases blood osmotic pressure |
| <i>Crataegus sp.</i> | Anti-spasm, heart tonic, lowers blood pressure, astringent |
| <i>Ailanthus altissima</i> | Cure for tapeworm, anti-diarrhea |
| <i>Salix alba</i> | Antifebrile, anti-spasm, cure for flowing semen and hard-to-cure wounds |
| <i>Datura stramonium</i> | Anti-spasm, whooping cough, involuntary urination, cancer wounds, burns, and sore eye |
| <i>Solanum nigrum</i> | Sedative, cure for indigestion, stomach and intestinal pains, whooping cough, nipple split, burns |
| <i>Ulmus minor</i> | Tonic, diaphoretic, diuretic, softener, astringent, healer |
| <i>Celtis australis</i> | Astringent, cure for simple diarrheas, dysentery, and epilepsy |

REFERENCES

- [1] Babakhanloo, Parviz. 1991. Gathering and identification, planting and domestication and investigation of active agents in medicinal plants, the Institute of Forestry and Pasture Research, 30 p.
- [2] Rezaee, Mohammad Bagher. 2005. Introduction and Presentation of Results of Several Strategic Projects on Medicinal Plants. Proceeding at the National Conference on Sustainable Development of Medicinal Plants, Mashhad. 10 p.
- [3] Zargari, Ali. 1985-1991. Medicinal Plants. Volumes 1-5. Tehran University. Pp 4678.
- [4] Mozaffarian, Valiollah. 2005. Getting to know Medicinal Plants and the Problems Associated with Them. Proceeding at the National Conference on Sustainable Development of Medicinal Plants, Mashhad 13 p.
- [5] Maaghool, Mojtaba. 1993. Research Report on Medicinal Plants, Agricultural Research Center of Isfahan. 7 p.
- [6] Mansoori, Ahmad. 1993. Phytochemical Study of Four Species of the Genus Gathered in Isfahan. The University of Medical Sciences of Isfahan, the Faculty of Pharmacy. Doctorate Thesis in Pharmacy.
- [7] Nasser, Sanaz and Bararpoor, Samareh. 2006. Study of the Vegetative Cover of the Protected Area of Miankaleh. BSc. Thesis. 111 P.
- [8] Hamilton. A. 2003. Medicinal plants and conservation, *International Plants Conservation Unit*, WWF-UK Panda House, Catteshall Lane Godalming, Surrey GU7 1XR, UK.
- [9] Kraft. 1999. Herbal medicine product and drug low. *Forsch komple mental Med.* Pp: 6-19.
- [10] UNESCO. 1996. *Culture and Health*, orientation Texts-World Decade for Cultural Development 1988 – 1997, Document CLT/DEC/PRO – 1996 Paris, France, 129 p.
- [11] Govaerts R. 2001. How many species of seed plants are there? *Taxon* 50:1085-1090.
- [12] Schippmann U, Leaman D. J. 2002. Cunningham AB: Impact of cultivation and gathering of Medicinal Plants on Biodiversity: Global Trends and Issues. In (FAO). Biodiversity and the ecosystem approach in agriculture, forestry and fisheries. Satellite event on the occasion of the Ninth regular session of the commission on genetic resources for food and agriculture. Rome 12-13 October 2002 Inter departmental working group on biological diversity for food and agriculture, Rome 2002.

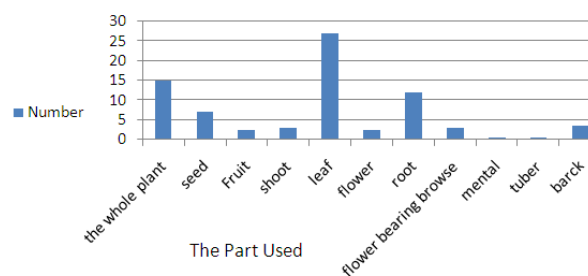


Fig. 1 Parts of plants used from the species present in the protected area of Miankaleh