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Floristic Study of Mirabad Region

[1]A. Hasanzadeh Gorttapeh and [2]J. Panahy
[1]Agricultural and Natural Sources Research Center of West Azerbaijan, Urmia, Iran
[2]Department of Biology, Urmia University, Urmia, Iran

Abstract: The study area (Mirabad) is located between 36°, 55' to 37° north latitude and 45°, 05' to 55°,44' east longitude in west Azerbaijan province. In this study, Flora of this region was determined by using available references. We encountered 192 species that belongs to 126 genera and 41 families. The largest family of region is Asteraceae with 31 sp. and the largest Genera is *Astragalus* with 7 sp. The main life forms are: Hemicryptophyte with 30.2% and Therophyte with 28.1%. The most extended chorotype with 62.5% is related to: Irano_ Turanian.

Key words: Flora, species, life form, Mirabad, Iran

INTRODUCTION

The diversity of plant life is an essential underpinning of most of our terrestrial ecosystems. Humans and most other animals are almost totally dependent on plants, directly or indirectly. Another important role of plant life is the provision of ecosystem services the protection of watersheds, stabilization of slopes, improvement of soils, moderation of climate and the provision of a habitat for much of our wild fauna.

While it is generally accepted today that the conservation of all biodiversity should be our goal, understanding the natural distribution of plants (Floristic studies) is central to conserving biodiversity and managing ecosystems for long-term viability and sustainability. Iran is a country with high divers climate and topography, which leads to diversity in natural and biological resources. Therefore, for management in order to conservation of this diversity, prevention from destruction of habitats, determining the native, resistant and endangered species and supporting them, recognition of medicinal plants for proper use of them, Floristic studies is necessary. Nowadays, many studies in this field have been doing by researchers, such as: plant species of Vanak-Semirom-Isfahan (Parishani, 2003); Floristic study of Palangdarreh-Qom (Mirzaei, 2001); Floristic study of Dalamper-West Azerbaijan (Shaikhi, 2005); Floristic study of National park of Urmia Lake (Biabani, 2000); Floristic study of Ghasemeloo (Shohada) Valley, forest reservoir (Malekmohammady, 2006). While this sort of studies is very useful for planning with refer to protection, reclamation and management of valuable species, present study was done in Mirabad region in 2005-2006.

MATERIALS AND METHODS

The study was conducted at Mirabad region during the growing season of 2005 and 2006. This region is located between 36°, 55' to 37° north latitude and 45°, 05' to 55°, 44' east longitude in northwest of Iran in west Azerbaijan province. Minimum altitude of region is 1600 m in Chamdrud and black river and maximum altitude is 2800 m in Shatar Mountain.

In this investigation, plant specimens were collected in different seasons. The samples were transferred to the herbarium and were pressed and recognized according to the Flora of Iran; Assadi (1988-2002), Flora of Iran; Rechinger (1963-2000), Flora of Iran; Parsa (1943-1950), Flora of Turkey; Davis (1965-1988), Colored Flora; Ghahreman (1975-2000), *Astragalus* communities of Iran; Masoumiramak (1986-2000) and Flora of Iran; Mobayen (1980-1996). In this manner geographical plant distribution also determined according these Flora. Determining the life form was done by Raunckier's classification (Raunchier, 1934), Iran's endemic species determined according to Red data book of Iran (Jalili and Jamzad, 1999) and then floristic list of this region provided in this study.

RESULTS

The results of study show that about 192 species belong to 126 genera and 41 families have been

Corresponding Author: A. Hasanzadeh Gorttapeh, Agricultural and Natural Sources Research Center of West Azerbaijan, Urmia, Iran

Table 1: Frequency of species in family

No. of species	1	2	3	4	5	6	13	23	24	27	31
No. of family	19	6	4	5	1	1	1	1	1	1	1

Table 2: Frequency of species in genus

No. of species	1	2	3	4	7
No. of genus	79	35	8	3	1

Table 3: Life form spectrum of species in Mirabad

Life form	He	Th	Ph	Ch	Cr
Percentage	30.2	28.1	17.7	12.5	11.5

Th: Therophyte, He: Hemicryptophyte, Ch: Chamaephyte, Ph: Phanerophyte, Cr: Cryptophyte

Table 4: The phytocorya distribution of species in Miarabad

Phytocorya	IT	IT,ES	ES	Endm	IT, Med	ES, Med	Med
Percentage	62.5	21.35	6.78	4.68	2.6	1.57	0.52

IT: Irano-Turanian, ES: Euro-Siberian, Med: Mediterranean, Endm: Endemic

Table 5: Floristic list of Mirabad region

Scientific name	Life form	Chorotype
Amaranthaceae		
Amaranthus retroflexes L.	Th	IT
Amaryllidaceae		
Ixilirion tataricum (Pall.) Herb.	Cr	IT
Apiaceae		
Echinophora orientalis Hedge and Lamond	He	IT
Eryngium billardierii Delar	He	IT
Ferula communis	He	IT
Ferula orientalis L.	He	IT
Ferula ovina Boiss.	He	IT
Prangos ferulaceae (L.) Lindl.	He	IT
Asphodelaceae		
Eremurus stenophyllus (Boiss.) Baker	He	IT
Asteraceae		
Achillea millefolium L.	Cr	IT,ES
Achillea vermicularis Trin.	He	IT
Acroptilon repeus L.	He	IT
Anthemis tinctoria L.	He	IT
Anthemis triumfetiii (L.) All.	He	IT
Artemisia incana (L.) Druce	Ch	IT
Artemisia vulgaris L.	Ch	IT,ES
Carthamus lanatus L.	Th	IT
Charthamus oxycantha M.B.	Th	IT
Centanrea aucheri (D.C.) Wagenitz	Th	IT
Centhurea depressa M.B.	Th	IT
Centhurea virgata Lam.	He	IT
Chardinia orientalis (L.) D.C.	Th	IT
Cichorium intybus L.	He	ES
Cirsium arveuse (L.) Scap.	He	ES
Cirsium echinus (M.B.) Hand-Mzt	Th	IT
Chrysanthemum kotschyi Boiss.	Th	IT
Cousinia macroptera C.A.Mey.	He	IT
Cousinia purpurea C.A.Mey	He	IT
Crepis sancta (L.) Babcock	Th	IT
Echinops orientalis Trautv.	He	IT
Echinops pungeus Trautv.	He	IT,ES
Gundelia tournefortii L.	He	IT
Lactnca scarioloides Boiss.	Th	IT,ES
Senecio molis Willd.	He	IT
Senecio vernalis Woldst. and Kit.	Th	IT
Tanacetum abrotanifolium (L.) Druce.	He	IT
Taraxacum montanum (C.A.Mey) D.C.	He	IT
Tragopogon graminifolius D.C.	Th	IT
Xanthium strumarium L.	Th	IT,Med
Xeranthemum squarrosum Boiss.	Th	IT

Table 5: Continued

Scientific name	Life form	Chorotype
Berberidaceae		
Berberis vulgaris L.	Ph	IT,ES
Borraginacea		
Anchusa italica Retz.	Th	IT,ES
Onosma sericeum Willd.	He	IT
Brassicacea		
Alyssum bracteatum Boiss. and Buhse	He	Endm
Cardaria draba (L.) Desv.	He	Med
Descurainia sophia (L.) Schur.	Th	IT
Sisymberium loeselii L.	Th	IT
Campanulaceae		
Campanula glomerata L.	He	IT,ES
Caryophyllaceae		
Acanthophyllum acerosum Sosn.	Ch	IT
Acanthophyllum squarrosum Boiss.	Ch	IT
Dianthus orientalis Adams.	He	Endm
Silene dichotoma Ehrh.	Th	IT
Chenopodiaceae		
Ceratocarpus arenarius L.	Th	IT
Chenopodium album L.	He	IT,ES
Noaea mucronata (Forssl.) Aschers. Et Schweinf	Ch	IT,ES
Salsola kali L.	Th	IT
Convolvulaceae		
Convolvulus lineatus L.	Cr	IT
Cyperaceae		
Carex divisa	Cr	IT
Cyperus fuscus	He	IT,ES
Elaegnaceae		
Eleagnus angustifolia L.	Ph	ES
Equisetaceae		
Equisetum arveuse L.	He	ES
Euphorbiaceae		
Chrozophora tinctoria (L.) Juss.	Ph	IT
Euphorbia falcate L.	Th	IT,Med
Euphorbia stricta L.	Th	ES
Fabaceae		
Alhagi camelorum Fisch.	Ch	IT
Astragalus chartaceus	He	IT
Astragalus chrysostachys	Ch	IT
Astragalus comosus	Ch	IT
Astragalus effuses Bge.	Ch	IT
Astragalus ovinus Boiss.	He	IT
Astragalus oxyglittis	Th	IT
Astragalus tribuloides	Th	IT
Coronilla varia L.	He	Endm
Colntea arboresceus L.	Th	IT,ES
Glycyrrhiza glabra L.	Ch	Endm
Lotus gebelia vent.	Ch	IT
Medicago rigidula (L.) All.	Th	IT
Medicago sativa L.	Th	IT
Melilotus officinalis (L.) Desr.	Th	IT
Onobrychis cornuta (L.) Desr.	Ch	IT,ES
Onobrychis sativa L.	Ch	IT,ES
Sophora alopecuroides L.	He	IT,ES
Trifolium fragiferum L.	Th	IT,ES
Trifolium hybridum L.	He	IT,ES
Trifolium preteuse L.	He	IT,ES
Trifolium repeus L.	He	IT,ES
Trigonella monantha C.A.Mey.	Th	IT
Trigonella spruneriana Boiss.	Th	IT
Vicia ervilia (L.) Willd.	Th	IT
Vicia pannonica Crantz.	Th	IT

Table 5: Continued

Scientific name	Life form	Chorotype
Vicia truncatula Fischer ex M.B.	He	IT,ES
Fumariaceae		
Fumaria aspala Boiss.	Th	IT
Hypericaceae		
Hypericum scabrum L.	He	IT
Iridaceae		
Gladiolus segetum Ker.-Gawl.	Cr	IT,Med
Iris ibrica Hafftn	Cr	IT
Iris spuria L.	Cr	IT
Juglandaceae		
Juglans regia L.	Ph	IT,ES
Lamiaceae		
Mentha longifolia (L.) Hadson	Cr	ES
Mentha spicata L.	He	ES
Nepeta bracteata Benth.	Th	IT
Salvia nemorosa L.	He	ES
Salvia suffrotecosa Montbr. and Auch. Ex Benth	He	IT
Satureja laxiflora C. Koch.	Th	IT
Stachys inflate Benth.	Ch	IT
Stachys lavandulifolia Vahl.	Ch	IT
Teucrium orientale L.	Ch	IT
Teurium polium L.	Ch	IT,Med
Thymus kotschyanus Boiss.	He	IT
Thymus pubesceus Boiss. and Kotschy ex Celak	Ch	IT
Ziziphora clinopodioides Lam.	Ch	IT
Liliaceae		
Allium ampeloprasum L.	Cr	IT
Allium rubellum M.B.	Cr	IT
Allium stamineum Boiss.	Cr	Med,ES
Colchicum soboliferum (Fisch.&C.A.Mey) Stefanov	Cr	IT
Colchicum steveni Kunth	Cr	ES
Malvaceae		
Alcea ficifolia L.	He	Endm
Alcea koelzii L. Reidl	He	Endm
Malva neglecta Wallr.	Th	IT,ES
Oleaceae		
Fraxinus excelsior L.	Ph	IT,ES
Papaveraceae		
Papaver bracteatum Lindl.	He	IT
Papaver orientale L.	He	IT
Plantaginaceae		
Plantago lanceolata L.	He	ES
Plumbaginaceae		
Acantholimon olivieri (Jaub&Spach.) Boiss.	Ph	IT
Achantholimon venustum Boiss.	Ph	IT
Poaceae (Graminea)		
Agropyron intermedium (Host.) P.Beauv.	Cr	IT,ES
Agropyron trichophorum (Link) Richter	Cr	Med,ES
Bromus danthonii Trin.	Th	IT
Bromus tectorum L.	Th	ES
Bromus tomentellus Boiss.	He	IT
Cynodon dactylon (L.) Pers.	Cr	IT
Dactylis glomerata L.	He	IT,ES
Eremopyrom distans (C.Koch.)Nevski	Th	IT
Festuca arundinacea Schreb	Cr	ES
Festuca ovina L.	He	IT
Hordeum bulbosum L.	He	ES,Med
Hordeum marinum Hudson	Th	IT
Hordeum spontaneum C.A.Mey.	Th	IT,Med
Hordeum violaceum Boiss. Et Huet	He	IT
Melisa persica Kunth.	Cr	IT
Phragmites australis (Cav.) Trin.ex	Cr	IT
Poa bulbosa L.	Cr	ES
Poa prateusis L.	Th	IT,ES
Poa trivialis L.	Ch	IT,Es
Secale cereale L.	Th	IT
Secale montaneum Gass.	Th	IT

Table 5: Continued

Scientific name	Life form	Chorotype
Setaria glanca (L.) P. Beauv.	Th	It
Stipa barbata Desf.	He	IT
Polygonaceae		
Polygonum aviculare L.	Th	IT
Polygonum thymifolium Janb and Spach.	Ch	IT
Rheum ribes L.	Ch	IT
Rumex scatatus L.	Ch	IT
Resedaceae		
Reseda lnte L.	Th	IT
Rosaceae		
Amygdalus communis L.	Ph	IT
Amygdalus eleagnifolia Spach.	Ph	Endm
Amygdalus urmieusis (Bornm.) Browicz.	Ph	Endm
Cerasus iucana (pall.) Spach.	Ph	IT
Cerasus mahleb (L.) Miller. Gard.	Ph	IT
Cerasus microcarpa (C.A.Mey) Boiss.	Ph	IT
Cerasus pseudoprostrata Pojark.	Ph	IT
Cotoneaster numularioides Pojark.	Ph	IT
Cotoneaster ovata Pojark.	Ph	IT
Crataegus meyeri A. Pojark.	Ph	IT,ES
Crataegus pontica C. Koch.	Ph	IT,ES
Cydonia oblonga Mill.	Ph	IT
Malus communis	Ph	IT
Malus orientalis Ugl.	Ph	IT,ES
Poterium sanguisorba L.	Th	IT,Es
Potentilla canesceus Besser	Th	IT,ES
Potentilla recta L.	He	IT,ES
Prunus domestica L.	Ph	IT,ES
Prunus spinosa L.	Ph	IT,ES
Pyrus communis L.	Ph	IT,ES
Pyrus glabra Boiss.	Ph	IT
Rosa canina L.	Ph	IT
Rosa foetida Herrm.	Ph	IT
Rubus caesius L.	Ph	IT,ES
Rubiaceae		
Galium verum L.	He	IT
Rununculaceae		
Adonis aestivalis L.	Th	IT
Delphinium albiflorum	Th	Endm
Rununculus ancheri Boiss.	Cr	IT
Salicaceae		
Populus alba L.	Ph	IT,ES
Populus nigra L.	Ph	IT,Es
Salix alba L.	Ph	IT,ES
Salix wilhlmsiana M.B.	Ph	IT
Scrophulariaceae		
Scrophularia striata Boiss.	He	IT,Es
Verbascum spesciosum Schrad.	He	IT
Solanaceae		
Hyoscyamus pusilus L.	Th	IT
Solanum nigrum L.	Th	IT
Tymelaceae		
Daphne mucronata Royle.	Ph	IT
Ulmaceae		
Celtis australis L.	Ph	IT
Urticaceae		
Urtica dioica L.	Cr	IT,ES
Zygophyllaceae		
Zygophyllum fabago L.	Ch	IT

recognized. The biggest family of the region is Asteraceae with 31 sp. Fabaceae with 27 sp., Rosaceae with 24 sp. and Poaceae with 23 sp. are in the next order (Table 1).

Among the existing genera there are 79 genera with one sp., 35 genera with 2 sp., 8 genera with 3 sp. and

3 genera with 4 sp. and 1 genus with 7 sp. *Astragalus* with 7 species is biggest genera (Table 2).

The life form spectrum of plant species are as fallow: He: 30.2%, Th: 28.1%, Ph: 17.7%, Ch: 12.5%, Cr: 22% (Table 3).

The phytocorya distribution of species is as follow: IT: 62.5%; IT, ES: 21.35%; ES: 6.78%; Endm: 4.68%; IT, Med: 2.6%; ES, Med: 1.57%; Med: 0.52% (Table 4). Floristic list of Mirabad region is provided in Table 5.

DISCUSSION

It is concluded from the results of the study that the study area is very rich with refer to plant diversity. The existence 41 families, 126 genera and 192 species support this conclusion.

Among all plants He with 30.2% is dominant and Th with 28.1% is in the next order. In fact life forms of the plants indicate the possibility of adaptation of plants to environmental factors especially climatic condition. According to Dr. Mobayen (1980-1996), the frequency of He is due to cold and temperate climate and the frequency of Th plants is due to Mediterranean climate. On the whole the frequency of He and Th among the plants of the region shows that the effect from two types of climate-Mediterranean and cold temperate- affected them.

Hemicryptophyte adapted to condition of area. They adapted and developed themselves to area by using different ways such as: reserving water, using ground water, reducing their water need by loosing their leaves and reduction of vegetative growth.

Therophyte adapted to the dryness of the region and shortage rainfall. Because these plants spend vegetative period in the form of seed (Asri, 2003).

Dominance of Hemicryptophyte and Therophyte clearly indicate the adaptation of these plants to aridity of area.

The low percentage of Cryptophyte, Champhyte, Phanerophyte shows that they are not adapted to existence climate and edaphical situations. Each plant species has it's special ecological area with a known tolerance to life conditions of area. There fore, the geographical distribution of plant species depending on life conditions of area and adaptation of plants to area (Asri, 2003).

Astragalus diversity with its 7 species in this area, which is mountainous, shows that *Astragalus* has adapted to the mountainous conditions.

The photocopy distribution of plants reflects the climate conditions. Considering to this fact that 65.25% plant species in a region are IT elements, so we can conclude that this region belong to IT. IT (the Irano-Touranian region) is characterized by low rainfall and a long dry season.

The existence endemic species indicate diversity in Iran climate. The study area is under different conserving strategies including: protected area and non-protected area, additionally, with refer to conserving policies the protected area has the better situation.

The existence of Asteraceae family with large diversity is the result of destruction in some portions of this region. It is experiencly understood that the increasing of the number of some plant families including compositae accompanied with destruction in area; (Vakili *et al*., 2001; Archibold, 1995). Significantly the presence of these species: *Stachys inflate*, *Teucrium polium*, *Teucrium orientale* and *Euphorbia* spp. Is indication of destruction in no protected portions of this region. (Moaffarian, 2000). According to rich biodiversity of study area, which resulted from floristic study, it is quite possible to concentrate the improving practices and reclamate to area again.

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