



Study of the Flora, Life forms and endemic species chorology of Zaygan reserve in Shemiran, Tehran

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Abstract

Reserves have a basic role in the protection of flora .The Zaygan reserve (40 hectares) located in Qsran roudbar Shemiranat in Tehran province was selected in order to this study. This study has been done in order to introduce flora, identify life-form and geographic distribution of the species in this area. The methods were done by going to nature, identifying and sampling of existing plants. Site characteristics including altitude, address of collecting species, life-form, floristic list, geographical distribution of plants were recorded for each sample. Raunkiar system was used for this study. The results showed that 66 plant species were found and collected in Zaygan reserve that belong to 24 families. Most species belong to Asteraceae, Fabaceae, Rosaceae, Lamiaceae, Brassicaceae, Boraginaceae and Apiaceae with 10, 7, 7, 6, 6, 3, 3 species, respectively. The results showed that life-form of the phanerophytes, Geophytes, Hemicryptophytes, Therophytes, Chamephytes and climbing species were 25%, 24%, 20%, 19%, 10%, and 2% respectively. The geographic distribution of plants in Zaygan indicated 41% of species belong to Irano-Turanian area and the minimum of them (5%) belong to Mediterranean area and the high percentage of Irano-Turanian area indicates that this reserve has a good value of mentioned features.

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Introduction

Iran is the most attractive and versatile country among all countries in south –west Asia relating to vegetation. Diversity of flora and vegetation of Iran due to wide variety of climate, vegetation history and its potential of development. Specific soils and rocky substrates are often due to the differentiation of endemic species. In addition Iran's vegetation diversity flora is richer via sheltering those that have the wide distribution (Takhtajan, 1986). The balance between elements of plants and their life causes adapting to environmental conditions. Therefore, specific life-forms are created that harmonise with the environment (Mobaien, 1981). Since much areas of Iran are mountainous and these regions create various habitats where due to variations in climate, edaphic, topography and ecological conditions and each one is known as an ecological niche for attracting plant species. This condition is caused by a high diversity of flora in the mountainous areas of this country. There are various methods in the biological classification and also Raunkiar system is one of the most common and complete system for analyzing biological forms. This system is based on the position of limb and buds that branches and leaves appear after their poor season. Each species has a uniquely ecological area and endure a certain rate of ecological changes (Asri and Hamzeh, 1999). Alborz mountainous ecosystem is one of the most important ecosystems in our country and covers numerous plant species. Scope of its southern and northern slopes overlooks to the central Iranian plateau and the Caspian Sea, respectively, affected by humid climate, and has created a unique ecosystem. About 65 million years ago, the late Cretaceous to early Tertiary, geological period, vascular plants especially angiosperms have arisen in this area. Many researchers have studied the flora of Iran. The first floristic investigation in South west Asia was *Orientalis Boissier* (Boissier) flora that was published between 1867-1888. The first flora of Alborz was written by Buhse in 1899. Gilli (1939) studied the vegetation sociological and also floristic studies were done by Zohary (1973), Asri and Eftekhari (2002), Assadi (1988-2003) and Kelin (1991). The Ulmus

forest reserve with an area of about 40 hectares located in northeast of Zaygan village of Roudbar Qsran in Tehran province and geographically located in the Alborz range. As this reserve is very important so that the study of floristic, life-form and geographic distribution of plant is necessary. Therefore, the goal of this research is the study of floristic, life-form and geographic distribution of plants in Zayegan reserve in Shemiranat of Tehran (Alborz region).

Materials and methods

Site description

The Ulmus Zaygan forest reserve covers an area of about 40 hectares located in the northeast of Zaygan village in roudbar Qsran shemiranat of Tehran (Figure 1). Thus the coordinates of the case study are including: Northwest region with 35 ° 58 ' 37 " N latitude and 51 ° 37' 07 " E longitude, Northeast region with 35 ° 58' 47 " N latitude and 51 ° 35' 19 " E longitude, Southwest region with 35 ° 58' 29 " N latitude and 51 ° 35' 07 " E longitude and also coordinates of Southeast Region is 35 ° 58 ' 38 " N latitude and 51 ° 35 ' 28 " E longitude (Fig 1).

The meteorological data taken from the nearest meteorological station to the case study indicates that the mean annual precipitation is 300-400 mm. The meteorological data shows that the wettest and driest months are March and August, respectively. Soil studies show that pH ranges from 6 to 8. The Zaygan altitude ranges from 2200 to 2600 m a. s. l. and the average slope has been reported of 65%.

Study methods

The sampling method was done by going to nature and collecting plant species in April, May and September of 2011. After the plant species had been collected, they dried and pressed and then all samples were sent to herbarium of Azad university of North Tehran. Before maintaining samples in the herbarium, some information including the collection address, altitude, scientific name and herbarium number were recorded. The plant species were identified with using *Flora of Iranica* (Rechinger, 1963-1998), *Flora of Turkey* (Davis, 1965-1985) and

Flora of Iran (Assadi1988-2003). The plant species was determined with using Rankiar system (Raunkiaer, 1934). This system is based on revivals buds. Naming plants was done using botanical glossary (Mozafariyan, 1996) and the endangered species were identified using Red Data book (Jalili and Jamzad, 1999). The lists of present species were indicated in the study area.

Results

The results showed that 66 plant species were found and collected in Zaygan reserve that belongs to 24 families. Most species belong to Asteraceae, Fabaceae, Rosaceae, Lamiaceae, Brassicaceae, Boraginaceae and Apiaceae with 10, 7, 7, 6, 6, 3, 3 species, respectively.

Table 1. The name of species collected in Zaygan reserve.

Herbarium number	Medical plants	Chorotype**	Lifeforme	Endemic	endangered speices	Speices name	Family names
16201	-	M	Ph	-	✓	<i>Pistacia atlantica</i> Desf.	Anacardiaceae
16202	-	IT	Hem	-	-	<i>Eryngium billardieri</i> F.Delaroche	Apiaceae
16203	-	Pl	Ch	-	-	<i>Ferula alliacea</i> Boiss.	Apiaceae
16204	✓	IT	Hem	-	-	<i>Pimpinella aurea</i> Dc.	Apiaceae
16205	✓	IT	Hem	✓	-	<i>Achillea wilhelmsii</i> C. Koch.	Astraceae
16206	-	Cos	Th	-	-	<i>Cardus onopordioides</i> Fisch.	Astraceae
16207	-	Cos	Th	-	-	<i>Centaurea virgata</i> Lam.	Astraceae
16208	✓	IT	Ge	-	-	<i>Cirsium arvensis</i> L.	Astraceae
16209	-	IT	Ge	✓	-	<i>Echinops cephalotes</i> Dc.	Astraceae
16210	-	Cos	Ge	-	-	<i>Lactuca aculeota</i> Boiss.	Astraceae
16211	-	IT,Es,M	Th	-	-	<i>Senecio vulgaris</i> L.	Astraceae
16212	-	Cos	Th	-	-	<i>Sonchus oleraceus</i> L.	Astraceae
16213	-	Pl	Ge	✓	-	<i>Tragopogon sosnovsky</i> L.	Astraceae
16214	-	Cos	Th	-	-	<i>Xeranthemum squarrosum</i> Boiss.	Astraceae
16215	-	IT	Ph	-	-	<i>Berberis integerrima</i> Bunge.	Berberidaceae
16216	-	IT	Hem	-	-	<i>Alkana bruceosa</i> Boiss.	Boraginaceae
16217	✓	Pl	Th	✓	-	<i>Myosotis pseudopropinqua</i> M.Pop.	Boraginaceae
16218	-	Es,IT	Hem	-	-	<i>Solananthus circinnatus</i> Ledeb.	Boraginaceae
16219	✓	Cos	Th	-	-	<i>Alyssum hirsutum</i> M.B.	Brassicaceae
16220	✓	Cos	Hem	-	-	<i>Cardaria draba</i> Desv.	Brassicaceae
16221	-	Pl	Th	-	-	<i>Clypeola janthlaspix</i> L.	Brassicaceae
16222	-	Cos	Th	-	-	<i>Camellina ramelica</i> Velen.	Brassicaceae
16223	✓	Pl	Hem	-	-	<i>Capsella bursa-pastoris</i> L.	Brassicaceae
16224	✓	Cos	Th	-	-	<i>Sisymbrium loeseli</i> L.	Brassicaceae
16225	-	M	Clm	✓	-	<i>Lonicera nummularifolia</i> Jaub.	Caprifoliaceae
16226	✓	IT	Ch	✓	-	<i>Dianthus orientalis</i> Adams.	Caryophyllaceae
16227	-	Pl	Hem	-	-	<i>Convolvulus arvensis</i> L.	Convolvulaceae
16228	✓	M	Ph	-	✓	<i>Juniperus polycarpus</i> C.Koch.	Cupressaceae
16229	✓	Cos	Ch	-	-	<i>Euphorbia heteradena</i> Jaub.	Euphorbiaceae
16230	-	IT	Ch	✓	-	<i>Astragalus gossypinus</i> Fisch.	Fabaceae
16231	✓	IT	Hem	✓	-	<i>Astragalus microcephalus</i> Willd.	Fabaceae
16232	-	Pl	Ge	-	-	<i>Chesneya astragalina</i> Jaub.	Fabaceae
16233	-	M	Ph	✓	-	<i>Colutea persica</i> Boiss.	Fabaceae
16234	-	IT	Hem	-	-	<i>Sophora alopecuroides</i> L.	Fabaceae
16235	✓	Pl	Th	-	-	<i>Trgoriella capitata</i> Boiss.	Fabaceae
16236	-	IT	Th	-	-	<i>Acinus graveolens</i> (M.B).Link.Enum.	Lamiaceae
16237	✓	Cos	Th	-	-	<i>Lamium amplexicaule</i> L.	Lamiaceae
16238	-	IT	Hem	-	-	<i>Phlomis oliveiri</i> L.	Lamiaceae
16239	✓	IT,M	Hem	✓	-	<i>Teucrium pollium</i> L.	Lamiaceae
16240	✓	IT	Hem	-	-	<i>Stachys lavandulifolia</i> Vahl.	Lamiaceae
16241	✓	IT	Ch	✓	-	<i>Thymus kotschyanus</i> Boiss & Hohen	Lamiaceae
16242	-	Pl	Ge	✓	✓	<i>Gagea confusa</i> A.Terr.	Liliaceae
16243	-	Pl	Ge	-	-	<i>Muscaria neglectum</i> Guss.	Liliaceae
16244	-	Pl	Ge	-	✓	<i>Allium altissimum</i> Regel.	Liliaceae
16245	✓	IT	Ge	-	-	<i>Althea cannabina</i> L.	Malvaceae
16246	-	Pl	Ge	-	-	<i>Eragrostis pilosa</i> (L.).P.Beanv.	Poaceae

16247 -	Cos	Ge	-	-	<i>Erodium oxyrachnchum</i> M.	Poaceae
16248 -	Cos	Ge	-	-	<i>Hordeum spontaneum</i> C.Koch.	Poaceae
16249 -	IT	Ge	-	-	<i>Psathyrostachys fragilis</i> Boiss.	Poaceae
16250 -	IT	Ch	-	-	<i>Acantholimon ophiocladum</i> Rech.	Plumbaginaceae
16251 -	IT	Ph	-	-	<i>Atraphaxis spinosa</i> L.	Polygonaceae
16252 -	Es,IT,M	Ge	-	-	<i>Rumex sutatus</i> L.	Polygonaceae
16253 -	IT	Ph	✓	✓	<i>Amygdalus lycioides</i> Spach.	Rosaceae
16254 -	M	Ph	-	-	<i>Cerasus microcarpa</i> (C.A.Mey).Boiss.	Rosaceae
16255 -	IT	Ph	-	-	<i>Cerasus pseudoprostrata</i> Pojark.	Rosaceae
16256 -	IT	Ph	✓	-	<i>Cotonaster nummularioides</i> Pojark.	Rosaceae
16257 ✓	M	Ph	✓	-	<i>Crataegus meyeri</i> A. Pojark.	Rosaceae
16258 -	M	Ph	✓	-	<i>Malus orientalis</i> Ugl.	Rosaceae
16259 -	M	Ph	-	-	<i>Prunus divaricata</i> Ledeb.	Rosaceae
16260 ✓	IT,PON	Ph	-	-	<i>Rosa iberica</i> L.	Rosaceae
16261 -	Pl	Ph	-	-	<i>Rhamnus palasii</i> L.	Rhamnaceae
16262 -	Cos	Ge	-	-	<i>Callipeltis cucullaria</i> L.	Rubiaceae
16263 -	IT	Ph	-	-	<i>Salix alba</i> L.	Salicaceae
16264 -	IT	Hem	✓	-	<i>Verbascum cheiranthirifolium</i> Boiss.	Scrophulariaceae
16265 -	IT	Ph	-	-	<i>Celtis caucasica</i> Willd.	Ulmaceae
16266 -	M	Ph	-	✓	<i>Ulmus glabra</i> Hodson.	Ulmaceae

Life forme*: Ch =Chamephytes· Ge=Geophytes· Hem= Hemicryptophytes· Ph= Phanerophytes· Clm= Climbing · Therophyte=Th. Chorotypes** Es= Euro-sibrian· M= Mediterranean· pl= Pluiregional· Cosmopulit= Cos IT= Irano-Turanian

Discussion

The results show that 66 plant species have been identified in the Zaygan reserve that belongs to the 24 families. Most genres belong to Astraceae, Fabaceae, Rosaceae, Lamiaceae, Brassicaceae, Boraginaceae and Apiaceae. This value shows that most species are in popular families and this reserve is very important to study about vegetation characteristics such as classification. The Life-form percentages of phanerophytes, Geophytes, Hemicryptophytes, Therophytes, Chamephytes and climbing species were 25%, 24%, 20%, 19%, 10%, and 2% respectively. The life-form of plant shows morphological adaptation relative to climate, edaphic and ecological condition in the site area. The high percentage of phanerophytes indicates adaptation of these plants with cold climate and mountainous conditions (Archibold, 1995). Regarding to chorology, Irano-Turanian, Cosmopotic, Pluiregional, Mediterranean region cover geographical distribution of 41%, 21%, 18%, 20%, respectively. According to the number and type of these species, it can be concluded that Zaygn reserve has mixed species. Geographical distribution cannot indicate origins of plants exactly. The species that only are distributed in an area certainly can be named as a source, but determining

Pluiregional source is very difficult. On the other hand, current sites and flora are not completely adapted by present climatic conditions, because they are severely influenced by geological changes (Asri and Eftekhari, 2002). Zaygan reserve severely has been damaged because of improper operation and grazing. The decrease in diversity of plant species has led to presence of invasive species and soil erosion. Mountainous ecosystems have been become as genetic pools for keeping plant diversity that due to their especial plant species. Conserving and maintaining plants in their natural habitants generally are used as conservation of the main part of plant species. Organized programs are needed for conserving habitants and diversity in places where face to human activities and grazing.

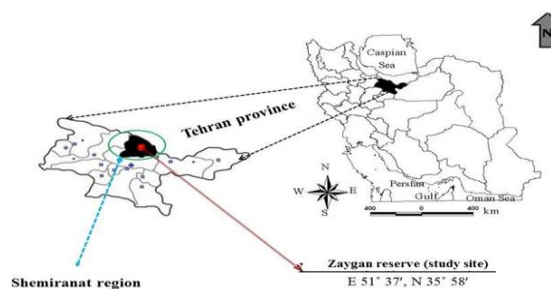


Fig. 1. location of study area in Tehran province, Iran.

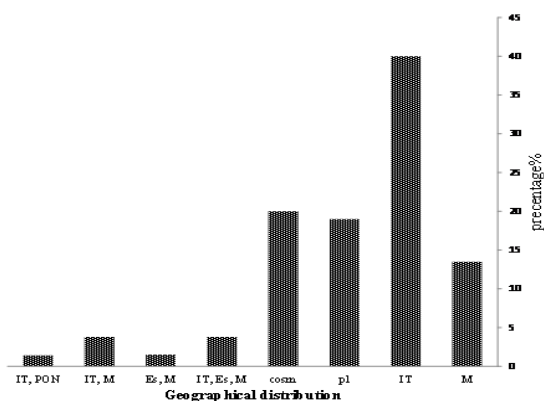


Fig. 2. The diagram of the geographical distribution of Zaygan reserve. The results of figure 2 showed that Irano-Turanian, Cosmopotic, Pluriregional, Mediterranean region covered geographical distribution of 41%, 21%, 18%, 20%, respectively.

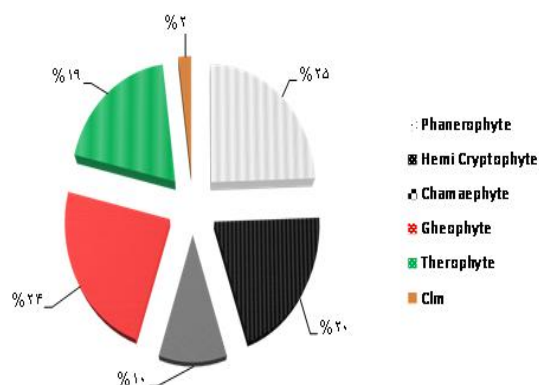


Fig. 3. The life-form percentages in Zaygan reserve. The results of figure 3 showed that Life-form percentages of phanerophytes, Geophytes, Hemicryptophytes, Therophytes, Chamephytes and climbing species were 25%, 24%, 20%, 19%, 10%, and 2% respectively.

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