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Investigation Flora and Life Form of Plants in Protected Region Sarigol (North Khorasan Province, Iran)

¹M. Nadaf and ²S.M. Mortazavi

¹Department of Biology, Payame Noor University, Bojnourd, Iran

²Islamic Azad University, Bojnourd Branch, Bojnourd, Iran

Abstract: Apart Flora, life form and chorotype of plants in protected region Sarigol was investigated in this study. It's located at the 57° 47' to 57° 76' Eastern latitude and 37° 55' to 37° 80' Northern longitude. A part plant of this area was collected in this region by classical method of regional floristic studies. The results of field investigation were identification of 78 plant species belong to 66 genera and 25 families. Lamiaceae, Poaceae, Fabaceae, Brassicaceae and Asteraceae were the most dominant families analysis of life form has shown proportion hemicryptophytes 39.74, followed by therophytes 21.79%, chamaephytes 19.23%, cryptophytes 11.53% and phanerophytes 7.69%. phytogeographical data has indicated that the most plants belong to the Irano-Turanian floral elements 75.64%.

Key words: Floristic, plant chorology, species, genera, Esfarayn

INTRODUCTION

The local plants identification and introduction of an area is very important because it can show: specific species of the local area and their occurrence, growing season, species hardness, distinct species, finding new species and the effect of climatic conditions like drought and over-grazing on vegetation (Ahmad *et al.*, 2008; Ali, 2008). Humans and most other animals are almost totally dependent on plants, directly or indirectly. Floristic studies of every region is necessary for conservation international storage every country and managing ecosystems for long term viability and sustainability other aims of identification of flora are: prevention from destruction of habitats, determining the native and resistance species and endangered species and supporting them, recognition of medicine plants.

Iran with a total surface area of 1.6×106 km² is a large country and after Turkey whit 7300 plant species (Akhami, 2006) is the richest country of a plant diversity in the SW Asia.

The rich flora of this land attracted many botanist. Rechinger (1963-2005) has studied the flora of Iran. He collected plants of different regions. The his results have been published under the title of flora Iranian.

Flora is published by other botanists are: Flora orient ales (Boissier, 1810-1885), flora of Iran (Parsa, 1950), Flora of Iran (Mobayen, 1996), flora of Iran (Assadi *et al.*, 2008), Colorful flora of Iran (Ghahraman, 1979-1998), Khorasan

vegetation (Mohassel, 1992) and Medicinal plants of Southern Khorasan (Pooyan, 1989).

Flora of many regions of Iran are not studied. Such as the protected region Sarigol in north khorasan (Iran).

Plant species can be grouped based on life-form. That have close relationships with environmental factors (Muller-Dombois and Ellenberg, 1974). Raunkier (1934) classified plants based on in which plants protect buds during unfavorable seasons. These main classes: phanerophytes, hemicryptophytes, chamaephytes, cryptophytes and therophytes.

The aim of this research is start for identification plants of the protected Sarigol region, life-form and chorological are determined.

MATERIALS AND METHODS

Sarigol with an area are 280 km² is located at Esfarayn (North khorasan province, Iran) at the 57° 47' to 57° 76' Eastern latitude and 37° 55' to 37° 80' Northern longitude. The altitude average is 1997 M. This study was conducted from 2007 to 2009.

The climate is arid and semiarid. According to available data from the nearest climatic station in Asadly (Anonymous 1983-2009), the average rain full is 332.5 mm. The mean maximum temperature of the warmest month (August) is 20.33°C and the mean minimum temperature of the coldest month (February) is -1.46. a part Plants of this area were collected in growing season from May to November, respectively. Plants are collected using normal

random collecting method indifferent habitat types. Then they are transferred to herbarium of department of the environment of north Khorasan province. After providing herbarium labels were identified using available literature. Endemic species of Sarigol area was determined according to Red data book of Iran (Jalili and Jamzad, 1999). Life form of the determined by Raunkier (1934) system.

The chorology of collected plants are determined according their regions distribution.

RESULTS AND DISCUSSION

We recorded 78 species belong to 66 genera and 25 families. In appendix of the paper checklist of all species collected in Sarigol protected area is shown with information about their life forms and chorological types. (Table 1). The families with the greatest number of species were Lamiaceae 10 species, Poaceae and Fabaceae

Table 1: List of species, life form and phytocorya from Sarigol protected area

Family/species	Life form	Phytocorya
Capparidaceae		
<i>Cleome coluteoides</i> Boiss.	He	IT
Caryophyllaceae		
<i>Acanthophyllum sordidum</i> Bunge ex Boiss.	Ch	IT
<i>Acanthophyllum squarrosum</i> Boiss.	Ch	IT
<i>Cerastium inflatum</i> Link ex Desf.	Th	IT
<i>Dianthus crinitus</i> subsp. <i>turcomanicus</i> (Schischk.) Rech.f.	Ch	IT
<i>Minuartia lineate</i> Bomm.	He	ES
Compositae/Asteraceae		
<i>Acroptilon repens</i> (L.) DC.	He	IT
<i>Carthamus oxyacantha</i> M.B.	Th	IT
<i>Centaurea virgata</i> Lam.	He	IT
<i>Cousinia eryngioides</i> Boiss	He	IT
<i>Cousinia lasiantra</i>	Ch	IT
<i>Cousinia verbascifolia</i>	He	IT
<i>Koelipinia tenuissima</i> Pavl.	Th	IT
Cruciferae /Brassicaceae		
<i>Aethionema carneum</i> (Bonks and soland.) B.Fedtsch.	Th	IT
<i>Alyssum inflatum</i> Nyarady	He	IT
<i>Clypeola jonthlaspi</i> L.	Th	M-IT
<i>Crambe kotschyana</i> Boiss.	He	IT
<i>Malcolmia africana</i> (L.)R. Br.	Th	IT
<i>Matthiola alyssifolia</i> (DC.) Bomm.	He	IT
<i>Matthiola farinosa</i> Bge.ex Boiss.	He	IT
<i>Stroganovia litwinowii</i> Lipsky	He	IT
Dipsacaceae		
<i>Scabiosa rotata</i> M.B.	Th	IT-ES
Ephedraceae		
<i>Ephedra intermedia</i> Schrank et C.A.Mey.	Ch	IT
Euphorbiaceae		
<i>Chorozophora tinctoria</i> (L.) Juss.	Ph	IT
Fabaceae		
<i>Athagi camelorum</i> Fisch.	Ch	IT
<i>Astragalus brevideus</i> L.	He	IT
<i>Astragalus obtusifolius</i> DC.	He	IT
<i>Astragalus odoreatus</i> Lam.	Ch	IT
<i>Astragalus subuklieusis</i>	He	IT
<i>Colutea buhsei</i> (Boiss.) Shap.	Ph	IT
<i>Hedysarum callitrix</i> Bunge ex Boiss.	He	IT

Table 1: Continued

Family/species	Life form	Phytocorya
<i>Medicago sativa</i> L.	He	IT
<i>Sophora pachycarpa</i> C.A.Mey.	He	IT
Graminae/poaceae		
<i>Aegilops columnaris</i> Zhuk.	Th	IT
<i>Agropyron intermedium</i> (Host) P.Beauv.	Cr	M-IT
<i>Boissiera squarrosa</i> Hochst.ex. Steud	Th	M-IT
<i>Bromus danthoniae</i> Trin.	Th	Cosm
<i>Bromus kopetdagheusis</i> Drobov.	He	IT
<i>Bromus tectorum</i> L.	Th	Cosm
<i>Hordeum bulbosum</i> L.	Cr	M-IT
<i>Melica persica</i> Kunth.	He	IT
<i>Taeniatherum crinitum</i> (Schreb.)Nevski.	Th	M-IT
Hyacinthaceae		
<i>Hyacinthus litwinowii</i> E.czern.		
Iridaceae		
<i>Iris kopetdagheusis</i> Mathew and Wendelbo.	Cr	IT
Juncaceae		
<i>Juncus bufonius</i> L.	Th	Cosm
Labiatae/Lamiaceae		
<i>Hymenocrater bituminosus</i> Fisch. and .C.A. Mey.	Ph	IT
<i>Hymenocrater elegans</i> Bunge.	Ch	IT
<i>Lagochilus cabulicus</i> Benth	Ch	IT
<i>Marrubium vulgare</i> L.	Cr	ES
<i>Perovskia abrotanoides</i> Karel.	Ch	IT
<i>Phlomis pungens</i> Willd.	He	IT
<i>Stachys lavandulifolia</i> Vahl.	He	IT
<i>Stachys trinervis</i> Aitch. and Hernsl.	He	IT
<i>Teucrium polium</i> L.	Ch	M-IT
<i>Ziziphora tenuior</i> L.	He	IT-ES
Liliaceae		
<i>Bellevardia saviczii</i> Woron.	Cr	M-IT
<i>Tulipa micheliana</i> Hoog.	Cr	IT
<i>Tulipa montana</i> lindl.	Cr	IT
Malvaceae		
<i>Alcea sulphurea</i> (Boiss. and Hohen) Alef	He	IT
<i>Hibiscus trionum</i> L.	Th	M-IT
Podophyllaceae		
<i>Bongardia chrysogonum</i> (L.) Boiss.	Cr	M-IT
Primulaceae		
<i>Androsace maxima</i> L.	He	IT-ES
Ranunculaceae		
<i>Coushida regalis</i> S.F.Gray	Th	IT-ES
Rosaceae		
<i>Amygdalus communis</i> L.	Ph	IT
<i>Cerasus microcarpa</i> (C.A. Mey)Boiss. subsp. microcarpa	Ph	IT
<i>Rosa persica</i> Michx.ex Juss.	Ch	IT
Rubiaceae		
<i>Gaillonia olivieri</i> A.Rich.	Ch	IT
<i>Rubia florida</i> Boiss.	Ch	IT
Tamaricaceae		
<i>Tamarix ramosissima</i> Ledeb.	Ph	IT
Thymelaeaceae		
<i>Stellropsis antoninae</i> Pobedimova	He	IT
Umbelliferae/Apiaceae		
<i>Falcaria vulgaris</i> Bernh.	He	E-M-IT
<i>Galagania platypoda</i>	Cr	IT
<i>Malabaila isfahanica</i> Alava.	He	IT
<i>Prangos latiloba</i> Korov.	He	IT
<i>Scandix aucheri</i> Boiss.	Th	IT
Valerianaceae		
<i>Valeriana ficariifolia</i> Boiss.	He	IT
<i>Valeriana plagiostephana</i> Fisch	Th	IT
Zygophyllaceae		
<i>Peganum harmala</i> L.	Ch	IT

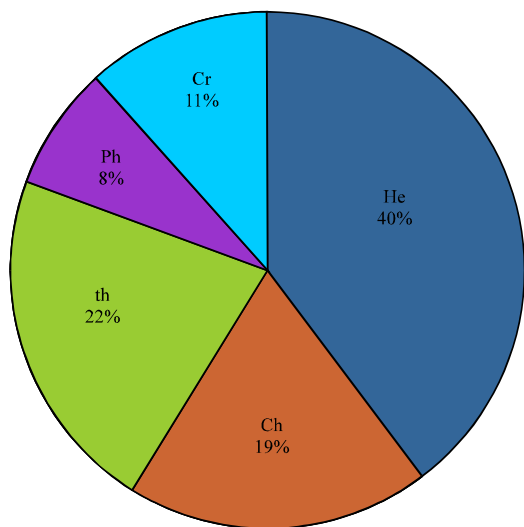


Fig. 1: The pie chart of life form of species Sarigol

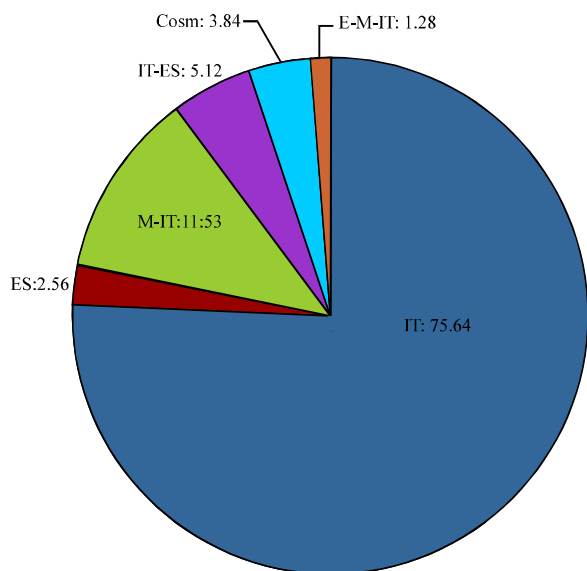


Fig. 2: The pie chart of percentage of phytocorya of species Sarigol

9 species, Brassicaceae and Asteraceae 8 species, Caryophyllaceae 5 species. The life-form spectrum was shown that a high proportion hemicryptophytes 39.74 followed by therophytes 21.79%, chanaeophytes 19.23% and cryptophytes 11.53% and phanerophytes 7.69% (Fig. 1).

In this region therophytes and hemicryptophytes are dominant. According to Mobayen (1996) the frequency of Therophyte plants is due to Mediterranean climate and the frequency of Hemicryptophyte is due to

cold and temperate climate. On the whole, the frequency of the Hemicryptophyte and Therophyte among the plants of the area shows that the effect from two types of climate-Mediterranean and cold temperate affected them.

Therophyte adapted to the dryness of the region and shortage rainfall, because these plants spend vegetative period in the form of seed (Asri, 2003). 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 losing their leaves and reduction of vegetative growth. Dominance of Hemicryptophyte and Therophyte clearly indicate the adaptation of these plants to aridity of area.

The chorology spectrum was shown: Irano-Turanian 75.64% Euro-Siberian 2.56% Mediterranean-Irano-Turanian 11.53% Irano-Turanian Euro-Siberian 5.12% Euro-Siberian Mediterranean-Irano-Turanian 1.28% cosmopolitan 3.84%. The most of plants chorotype with 75.64% is related to Irano-Toranean (Fig. 2). Similar results have also been reported that Iran is situated among three main phytochoria including Euro-Siberian (boreal), Irano-Turanian and Saharo-Sindian (White and Leonard, 1991) or Saharo-Arabian (Zohary, 1973; Akhani, 2007) and influenced by the introgression of Somalia-Masaei and Mediterranean species (Zohary, 1973; Takhtajan, 1986).

Among this 78 species in Sarigol region Malabia Isfahanica and *Rubia florida* are endemic of Iran.

This study was the first research in protected Sarigol region therefore we cannot able to compare with the pervious study.

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