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Vegetation structure and floristic composition (Case study: Mala Galeh Protected area, Fars Province, Iran)

Struktur vegetasi dan komposisi bunga (Studi kasus: Kawasan Lindung Mala Galeh, Provinsi Fars, Iran)

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Abstract. *Identifying flora of each region is fundamental for accomplishing other pure and applied researches in biology. Especially, in the ecological conditions of protected area of Male Gale. Data were collected in 96 sampling plots using systematic-random method. The size of sampling plot was (20× 50) m for the tree and shrub species, and (8×8) m for herbaceous species. In this study area, 162 species, 122 genera, and 43 families were identified. The largest families were Asteraceae (26 species) and Fabaceae (25 species). The frequency of Asteraceae may be due to grazing in some areas of the region. The life-form spectrum includes Hemichryptophytes (14/01%), Therophytes (65/4%), Cryptophytes (76/9%), Chamaephytes (7.1%), and Phanerophytes (5.8%). The abundance of Therophytes and Asteraceae family is referred to the destruction of forests in the study area. The highest value of the SIV tree and shrub species layer belong to Quercus brantii species and Ziziphus Mummularia. The highest value of the FIV herbaceous layer belongs to Asteraceae family. The Species Important Value (SIV) of vegetation cover indicated that trees, shrubs species, and herbaceous species had geometric distribution, broken stick model, and lognormal distribution in this area.*

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INTRODUCTION

Iran with an area of 1648000 km^2 is located in the south west of the continent of Asia (Moradkhani and Milan, 2015). Mountainous status of Iran and environmental factors such as: (climate, topography, soil) caused many species diversities in different regions, so, it has been the attention of researchers. Zagros Mountains is stretched from south-west to northwest of Iran and the altitude is about 1000-4300 m (Moradipour *et al*., 2018; Noroozi *et al.*, 2008). This ecosystem has been divided into three parts: northern, central and southern Zagros (Valipour *et al*., 2009). The number of plant species known in Iran is about 7600. The definition of protected areas based on IUCN (1976): Lands which, owing to their strategic value to the conservation of the nation's natural resources, are to be managed in a manner what will prevent degradation or, if already degraded, can be rehabilitated primarily through natural processes. Protection, management and restoration of plant and animal life and the maintenance of the natural state will be afforded the highest priority in providing conditions conducive to the regeneration and amelioration of habitats and species.

Identifying flora of each region is fundamental for accomplishing other pure and applied researches in biology (Rios and Recio, 2005; Heinrich *et al.*, 2004). Identify plants contribute greatly to the conservation and protection of the environment (Vaseghi *et al.*, 2007). Furthermore, with respect to the environmental disturbances like global warming, climate changes and human impact which change the number of plant species, (Parmesan, 2007; Parmesan and Yohe, 2003; Perry *et al.*, 2005; Körner and Basler, 2010). In the protected area of Malé Galle protected unique ecological and climatic conditions make it a remarkable habitat for the floristic studies. So, winter and rural rangelands comprise a large fraction of Male Galeh area. People in this region are highly dependent on rangelands; they use plants as sources for food, medicine, livestock production and etc. (Negahdarsaber *et al.*, 2017). Based on Raunkiaer's life-forms, plant species can be grouped into different life-forms classes based on structural and functional similarities (Smith, 1913; Sarmiento and Monasterio, 1983). Phytochorya study in a region is the base of ecological studies for better management of area (Moradkhani and Milan, 2015). In addition, Floristic survey of an area is an essential tool for conservation of biodiversity (Noroozi *et al.*, 2008).

Nowadays, many studies have been doing about this subjects in Iran and the world, such as: floristic study of Firuzeh watershed in north of khorasan province (Asaadi, 2009), study of life form in Sepidan, Fars Province, Iran (Negahdarsaber *et al*., 2017). Study of life form and chorology of plants in Jozak – Chaminbid area, north Khorassan Province, Iran (Nadaf *et al*., 2017). Vegetation basically is described by density, DBH and frequency parameters (Razavi *et al*., 2012). SIV (Species importance value) as an index covers all of these parameters (frequency, abundance, basal area) together for the determination of distribution and frequency patterns of species as well as judgments about ecological conditions that have more significance and for families FIV (Family Importance Value) used. Researchers proposed some models for the determination of frequency patterns. These distributions included geometric series, normal logarithmic and broken stick methods (Magurran, 2003). The purpose of this research was Study on Floristic Composition, to use SIV and FIV for the assessment of distribution of abundance of species.

MATERIAL AND METHODS

Study Area

The present study was carried out in the protected area of Malé Galle forest in the end of Komaresorkhi, Fars Province. This area is located at South Zagros, Fars province. Which is about 300 ha. The study area is located between 29°15'57″-30°36'5″ N latitude and 51°33'37″-52°25'56″ E longitude, in the southwest part of Iran. This region has semiarid temperate climate with the average annual precipitation of 593.4 mm and the mean annual temperature of 15.6 °C. The dry season is started from beginning of May through October (seven months) (Moradipour *et al*., 2018).

Data Collection and Analysis

Sampling vegetation was conducted in spring 2016. For this purpose, a random-systematic with (150×150) m inventory grid was used to establish 96 plots. The size of sampling plots was 1000 m^2 for the tree and shrub species, and 64 m^2 for herbaceous species. Percent cover of herbaceous and the crown cover of tree species were recorded. Chorotypes and lifeforms of each species were determined (Negahdarsaber *et al*., 2017). Density, abundance, frequency, basal area and species importance value (SIV) for each species have been calculated. The equations used are given as below (Pourbabaei *et al*., 2013):

SIV for tree layers = relative frequency + relative density + relative dominance
Relative frequency = (number of plots containing a species × 100)/total plots
Relative density = (number of individuals of a species × 100)/total number of individuals of all species
Relative dominance = (basal area of a species × 100)/total basal area of all species
SIV for shrub layers = relative frequency + relative density

The Family Importance Value (FIV) was calculated as follows:
FIV = relative density + relative diversity + relative dominance
Relative densit = (number of individuals of the species × 100)/total number of individuals in the sample
Relative diversity = (number of species in the family × 100)/total number of species in the sample
Relative dominance = (basal area of the family × 100)/total basal area in the sample

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Results

In the study area, 162 species were recorded belonging to 122 genera, and 43 families. 74 species of 162 plant species were indicator species. The phytogeographical elements include Irano-Turanian (42/5%), Irano-Turanian-Mediterranean (17/9%), Irano-Turanian-Sahara Sindian (13/7%). So, Irano-Turanian was the most dominant Chorotypes (Table 1).

Table 1 List of, species, family, life form and chorotypes in the study area. chorotypes (IT: Irano-Turanian; ES: European-Siberian; M: Mediterranean; Cosm: Cosmopolite; SS: Sahara-Sindian), Life forms (Th: Therophyte; H: Hemicryptophyte; Ch: Chamaephyte; Cr: Cryptophyte; Ph: Phanerophyte)

Family and Scientific name	Life-form	Chorotype	Indicator species	Medicinal plant
Asteraceae				
Carduus arabicus Jacq ex. Murray	T	ES , M	*	
Gymnarrhena micrantha Desf**.**	He	IT,SS		
Reichardia orientalis (L.) Hochreutiner	T	IT		
Artemisia aucherii Boiss.	Ch	IT	*	*
Cymbolaena griffithii	T	IT		
Achillea wilhelmsii C. Koch	He	IT		*
Atractylis cancellata L**.**	T	IT,M	*	
Calendula Persica C. A. Mey.	T	IT,M		
Outreya carduiformis	T	IT,SS		
Crepis kotschyana (Boiss.) Boiss.	T	IT,M	*	
Crepis sancta (L.) Babcock	T	IT,SS	*	
Centaurea bruguieriana (DC.) Hand. Mzt	T	IT, SS		
Koelpinia tenuissima Pavl. &Lipsch.	T	IT	*	
Lactucaserriola L.	He	IT,ES,M	*	
Launea procumbens (Roxb.) Ramayya&Rajagopal**.**	He	IT		
Senecio glaucus L.	T	IT,M,SS		
Tragopon longirostris Bisch**.**	T	IT		
Gundelia tournefortii L.	He	IT		
Anthemis altissima L**.**	T	IT	*	*
Anthemis persica Boiss.	T	IT		*
*Anthemis austro – iranica*Rech. f**.**	T	IT	*	*

*Anthemis haussknechtii*Boiss. &Reut.	T	IT		*
Anthmis tinctoria	T	IT,M	*	*
Centaur eaintricata Boiss.	Ch	IT		
Filago desertorum Pomel	T	IT, ES, SS		
Picnomon acarna (L.) Cass.	He	IT,M		
Apiaceae				
Falcaria vulgaris Bernh.	He	IT, SS		
Pimpinella barbata (DC.) Boiss	T	IT,SS	*	
Scandixpecten - veneris L.	T	IT	*	
Torilis leptophylla (L.) Reichenb.	T	ES, IT, M		
Bupleurum croceum Fenzl	T	IT		
Lagoecia cuminoides L.	T	IT	*	
Oliveria decumbens Vent.	T	IT	*	*
Aniso sciadiumorientale DC.	T	IT		
*Eryngium billardieri*F.Delaroche	He	IT		
Araceae				
Biarum carduchorum	Cr	IT		
Anacaridaceae				
Pistacia khinjuk Stocks	P	IT	*	*
Pistacia atlantica Desf.	P	IT	*	*
Aizoaceae				
Aizoon canariense L.	T	IT,M		
Aceraceae				
Acer monspessulanum L. subsp. Cinerascens (Boiss.)Yaltri	P	IT	*	
Amaryllidaceae				
Ixiolirion tataricum (Pall.) Herb.	Cr	IT, SS, ES		
Brassicaceae				
Erucaria hispanica (L.) Druce	T	IT, M		
*Allysuminflatum*Nyarady.	T	IT, M	*	
Bisculella didyma L	T	IT, M	*	
Brassica deflexa Boiss.	T	IT	*	
Capsella bursa-pastoris (L.) Medicus	T	IT, M, SS		*
Matthiola longipetala (Vent.) DC.	T	IT, M		
Sinapis aucheri (Boiss.) O. E. Schulz	T	IT	*	
Cardaria draba (L.) Desv.	T	COSM	*	*
*Clypeola dicotoma*Boiss.	T	IT	*	
Euclidium syriacum (L.) R. Br.	T	IT		
Boraginaceae				
Arnebiadecumbens (Vent.) Coss. &Kral	T	IT,SS		
Cistaceae				
Helianthemum aegyptiacum (L.) Miller	T	IT,M,SS	*	
Helianthemum europaeum L.	T	IT,M,SS		
Crassulaceae				
*Umbilicus intermedicus*Boiss.	Ge	IT,M		
Sedum rubens L	T	IT, M	*	
Cryptogrammaceae				

Onychium melanolepis (Dcne) Kze.	Cr	IT		
Convolvulaceae *Convolvulus leiocalycinus* Boiss	Ch	IT,SS		
Convolvulus oxyphyllus Boiss	Ch	IT, SS		
Chenopodiaceae				
Noaea mucronata (Forssk.) Aschers. & Schweinf	Ch	IT		
Dipsacaceae *Scabiosa olivieri Coult*	T	IT		
Euphorbiaceae				
Euphorbia helioscopia L.	T	IT		
Chrozophora tinctoria (L.) Juss.	T	IT, M		
Fagaceae				
Quercus brantii Lindl**.**	P	IT	*	
Fumariaceae				
Fumaria bracteosa Pomel	T	IT		
Fumaria densiflora DC.	T	IT	*	
Gentianaceae *Gentianao livieri* Griseb.	He	IT		
Geraniaceae				
Erodium cicularium (L.) Lher.	T	IT,M,ES	*	
Erodium moschatumer (L.) Lher. Ex Aiton	T	IT,M	*	
Geranium rotundifolium L.	T	IT,M,ES	*	
Erodium gruinum (L.) L Her. Ex Aiton.	T	M	*	*
Lamiaceae *Ajuga astro-iranica* Reth. F**.**	Ch	IT	*	
Marrubium Cuneatum Russel	He	IT		
Phlomis olivieri Benth**.**	He	IT		
Phlomis bruguieri Desf.	Ch	IT	*	
Salvia compressa Vevt**.**	He	IT		*
Salvia macrosiphon Bioss.	T	IT	*	
Teucrium polium L.	He	IT,M		*
Ziziphora tenuir L**.**	T	IT	*	*
Lallemantia iberica (Stev.) Fisch. & C. A. Mey.	T	IT	*	
Lamium amplexicaule L**.**	Ch	IT, ES	*	
Teucrium orientale L.	He	IT,SS	*	*
Otostegia persica	Ch	SS	*	*
Liliaceae *Linum strictum* L.	T	IT		
Gagea tenuifolia (Boiss.) Fomin	Cr	IT	*	
Muscari tenuiflorum Tausch	Ge	IT	*	
Ornithogalum persicum Hausskn. Ex Bornm.	Cr	IT,M		
Muscari neglectum Guss	Cr	IT,ES	*	
Tulipa stylosa Stapf	Cr	IT.M	*	
Allium stamineum Boiss	Cr	M	*	
Malvaceae	T	IT, M, SS		*

Malva parviflora L.				
Moraceae				
Ficus johannis Boiss.	P	IT		
Plumbaginaceae				
Acantholimon asphodelinum Mobayen.	CH	IT		
Papaveraceae				
Roemeria hybrida (L.) DC.	T	IT, SS		
Fabaceae				
Astragalus glaucacanthus Fisch.	CH	IT	*	
Alcea aucheri (Boiss.) Alef**.**	He	IT		
Hymenocarpus circinnatus (L.) Savi	T	M		
Lathyrus inconspicuus L**.**	T	IT		
Ononis viscosa L.	T	IT		
Ebenus stellata Boiss	Ch	IT	*	
Hippocrepis unisiliquosa L.	T	M		
Lens cyanea (Boiss. and Hohen.) Alef**.**	T	IT		
Lens orientalis Boiss**.**	T	IT	*	
Medicago coronata (L.) Bartalini	T	IT		
Medicago minima (L.) Bartalini	T	IT,M,SS,ES	*	*
Medicago orbicularis (L.) Bartalini	T	IT	*	
Medicago polymorpha L.	T	IT.M	*	
Medicago rigidula (L.) All**.**	pl	IT		
Melilotus sulcatus	T	IT		
Onobrychis crista-galli (L.) Lam**.**	T	IT,SS		
Scorpiurus muricatus L**.**	T	M		
Trifolium campestre Schreb**.**	T	IT	*	*
Trifolium resupinatum L.	T	IT	*	
Trifolium tomentosum L**.**	T	IT		
Trifolium dasyurum C. Presl	T	ES, IT		
Trigonella monspeliaca L.	T	IT.M	*	
Trigonella elliptica Boiss**.**	T	H. IT,SS	*	
Vicia sativa L.	T	IT,ES,M		
Vicia peregrina L**.**	T	IT		
Plantaginaceae				
Plantago lagopus L.	He	IT, M, SS	*	
Plantago ovata Forssk.	T	IT,SS,M,ES	*	
Plantago psyllium L**.**	T	IT,SS,M,ES	*	
Plantago coronopus L.	He	IT, SS		
Plantago bellardi All.	T	IT, SS		
Poaceae				
Aegilops umbellulata Zhuk.	T	IT	*	
Avena fatua L.	T	IT	*	
Bromus danthoniae Trin.	T	COSM		
Bromus scoparius L.	T	IT,ES		
Bromus tectorum L.	T	IT,SS,M,ES	*	
Heteranthelium piliferum (Banks &Soland.) Hochst.	T	IT,M		

Phalaris minor Retz.	T	IT		
Cynodon dactylon (L.) Pers.	T	IT,M		
Poa bulbosum L.	Cr	COSM	*	*
Hordeum bulbosa L.	T	IT		
Lophochloa phleoides (Vill.) *Reichenb..*	T	ES, IT, M, SS		
Poa bulbosa L.	Cr	ES, IT, M, SS	*	*
Poa sinaica steud.	Cr	IT,M,ES	*	
Stipa capensis Thunb.	Cr	IT,M,SS		
Bromus squarrosa L.	T	IT,SS		
Hordeum glaucum Steud	T	ES, IT	*	
Taeniatherum crinitum (Schreb.) *Neveski*	T	IT,M,SS		
Polygonaceae				
Rumex cyprius L.	T	IT	*	
Rumex vesicarius L.	He	IT.SS		
Rumex arvensis L**.**	T	IT		
Podophyllaceae				
Bongardia chrysogonum (L.)Boiss.	T	IT,M	*	
Primulaceae				
Anagallis arvensis L.	T	COSM	*	
Ranunculaceae				
Anemone biflora DC.	T	IT,SS		
Ceratocephala testiculata (Crantz) Roth	T	IT		
Ranunculus arvensis L	T	IT		
Resedaceae				
Reseda lutea L**.**	T	IT,SS	*	*
Rhamnaceae				
Ziziphus spina-chirsti (L.) Willd	p	PL		
Ziziphus nummularia (Burm. f.) Wight &Arn**.**	p	SS	*	
Rosaceae				
Cerasus microcarpa subsp. Diffusa (Boiss. &Hausskn) Browicz	p	IT	*	
Amygdalus lycioides Spach	p	IT		
Amygdalus scoparia spach**.**	p	IT	*	*
Rubiaceae				
Callipeltis cucullaria (L.) Stev.	T	IT, SS		
Galium setaceum L	T	IT, SS		
Sinopteridaceae				
Cheilanthes catanensis (Cosent.) H.P. Fuchs.	Cr	IT, M	*	
Solanaceae				
Datura stramonium L.	T	IT		*
Thymeleaceae				
Daphne mucronata Royle**.**	p	IT	*	*
Valerianaceae				
Valerianella vesicaria (L.) Moench.	T	IT	*	
Zygophyllaceae				
Peganum harmala L	He	ES, IT, M, SS		*

The results showed that therophytes (65.4%), hemicryptophytes (14.01%), cryptophytes (7/69%), chamaephytes (7/1%) and phanerophytes (5/8%) were the dominant life forms of the area, respectively (Table 1). The families with the highest number of species were Asteraceae (26 species) followed by Fabaceae (25 species), Poaceae (17 species), Lamiaceae (12 species), Brassicacea (10 species) and Apiaceae (9 species). The dominant Trees based on basal area were *Quercus brantii* with 26.88 m^2 followed by *Amygdalus scoparia* with 7.2 m^2. Thus, dominant families based on basal area were Fagaceae followed by Rosaceae. The dominant Trees based on relative density were *Quercus brantii* (48.34) followed by *Amygdalus scoparia* (33.1). The dominant Trees based on relative frequency were *Quercus brantii* (7.29) followed by *Acer monspessulanum* (26). The dominant Trees based on relative dominance were by *Acer monspessulanum* (43) followed *Quercus brantii* (36.45). But, the highest Trees SIV were *Quercus brantii* (92.08) followed by *Amygdalus scoparia* (47.6) (Table 2).

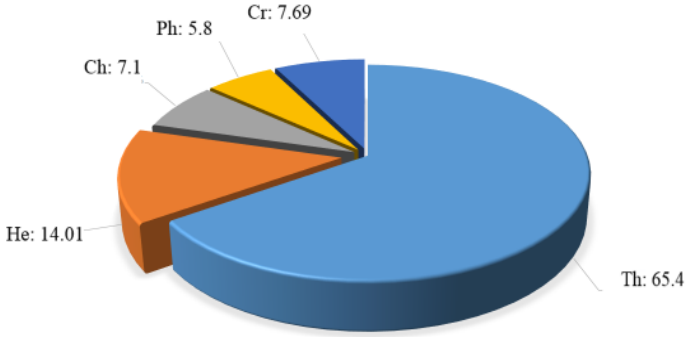

Figure 1 Life forms in the studied area**,** Ph: phanerophyte, Ch: chamaephytes, He: hemicryptophytes, Th:Therophytes, Gr: Cryptophytes

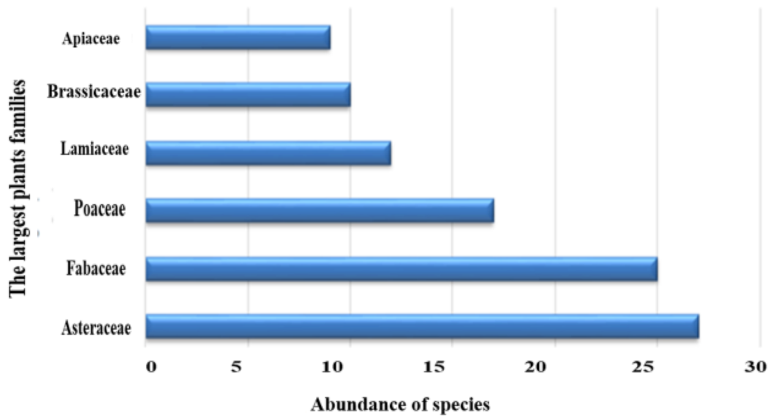

Figure 2 Abundance of plants families in the study area

Table 2 Abundance, density, frequency, basal area and Species Importance Values (SIV) of the tree layers

Tree Species	Basal area (m2)	Relative density	Relative frequency	Relative dominance	SIV
Quercus brantii	26/88	48/34	7/29	36/45	92/08
Pistacia atlantica	1/92	7/8	1/13	2/6	11/53
Pistacia khinjuk	0/39	2/6	0/37	0/52	3/49
Amygdalus scoparia	7/2	33/1	4/79	9/76	47/65
Acer monspessulanum	0/32	1/8	26/0	43/0	2/49

The dominant shrub layers based on relative density were *Ziziphus nummularia* with 95.89 followed by *Daphne mucronata* with 6.1. The dominant shrub layers based on relative frequency were *Ziziphus nummularia* with 0.81 followed by *Daphne mucronata* with 0.05. Therefore, the highest shrub layers based SIV was *Ziziphus nummularia* with 96.7 (Table 3).

Table 3 Abundance, density, frequency, basal area and Species Importance Values (SIV) of the shrub layers

Shrub species	Relative density	Relative frequency	SIV
Daphne mucronata	6/1	0/05	6/15
Cerasus microcarpa	2/46	0/02	2/48
Ziziphus nummularia	95/89	0/81	96/7

The dominant herbaceous layers based on relative density were Asteraceae family (26.6) followed by Fabaceae with (24.76). The dominant herbaceous layers based on relative diversity were Asteraceae family (16.6) followed by Fabaceae (15.43). The dominant herbaceous layers based on relative dominance were Asteraceae family (40.02) followed by Lamiaceae (21.66). So, the highest herbaceous layers based on FIV were Asteraceae family (83.22) followed by Fabaceae (65.22) (Table 4).

Table 4 Abundance, density, frequency, basal area and Family Importance Values (FIV) of the herbaceous species

Families	Relative density	Relative diversity	Relative dominance	FIV
Asteraceae	26/6	16/66	40/02	83/22
Fabaceae	24/76	15/43	25/03	65/22
Lamiaceae	11/42	8/02	21/66	40/03
Poaceae	20/95	10/49	16/61	48/15
Brassicaceae	9/52	6/17	8/33	24/02
Apiaceae	7/14	4/32	10/01	21/47

The results indicated that there was the geometric distribution model in the tree layers (Figure 3). The most and the least SIV *Quercus brantii* and *Pistacia khinjuk*. Broken stick model was found in the shrub layer (Figure 4). The most and the least SIV were *Ziziphus nummularia* and *Cerasus microcarpa*. The normal logarithmic model was model was detected in the herbaceous layers (Figure 5). The most and the least fIV were Asteraceae and Apiaceae.

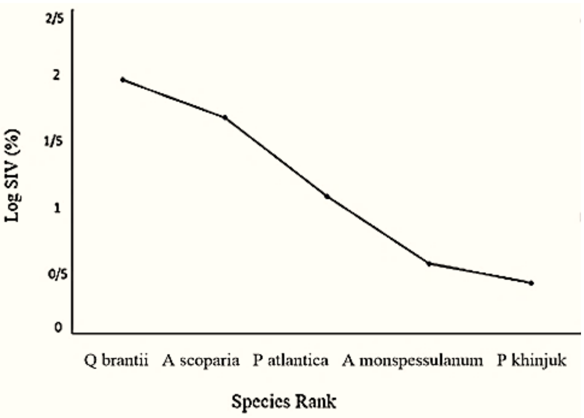

Figure 3 Distribution curve of species the in tree species

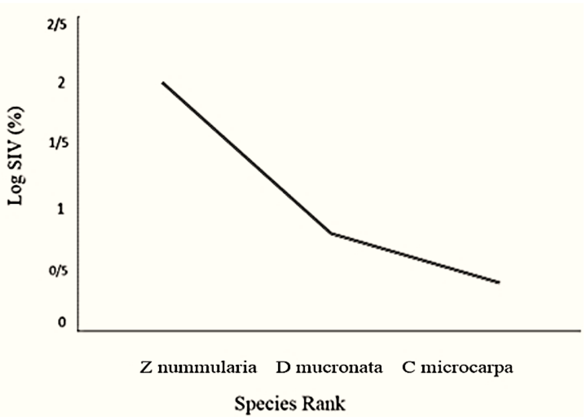

Figure 4 Distribution curve of species abundance in the shrub species

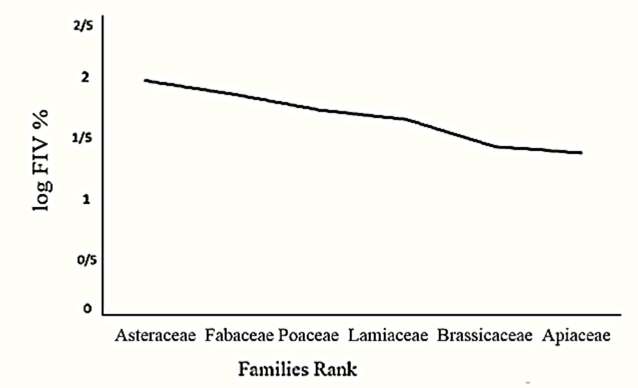

Figure 5 Distribution curve of species abundance in the families

Discussion

Land use changes act as a significant factor in the environmental changes in today's world. Unfortunately, for the last decades there has everywhere occurred a planned intrusion ofman into the deserts ecosystems. Floristic studies represent the past and present status in a region, and also play an important role in future predictions. This forest comprised of three storey (over storey: tree layers, middle storey: shrub layers, under storey: herbaceous layers). The results showed that Asteraceae and Fabaceae were the richest families in the present study. Fabaceae plays a role in soil fertility (Taber, 1973). Land use changes act as a significant factor in the environmental changes in today's world. Unfortunately, for the last decades there has everywhere occurred a planned intrusion of man into the deserts ecosystems. Floristic studies represent the past and present status in a region, and also play an important role in future predictions. The results showed that Asteraceae and Fabaceae were the richest families in the present study. Fabaceae plays a role in soil fertility (Taber, 1973) Land use changes act as a significant factor in the environmental changes in today's world. Unfortunately, for the last decades there has everywhere occurred a planned intrusion ofman into the deserts ecosystems. Floristic studies represent the past and present status in a region, and also play an important role in future predictions.

The results showed that Asteraceae and Fabaceae were the richest families in the present study. Fabaceae plays a role in soil fertility (Taber, 1973). The frequency of Asteraceae may be due to damage caused by grazing in some areas of the region which should be considered warning for the area (Negahdarsaber *et al*., 2017). Among identified species, 28 species have medicinal properties (Niknejad *et al*., 2014). The dominance of Therophytes and Hemicryptophytes can be referred to the simultaneous effects of climate fluctuations and livestock grazing on the flora of winter and rural rangelands in this area. This plants are the characteristics of the cold climate and mountainous region. High percentage of Trophytes in the region indicates two factors of degradation and drought in the region (Veiskarami *et al.*, 2012). Therefore, this point explains the value of flora of the region. 42.5% of the species belongs to the Irano-Turanian region. High percentage of Irano-Touranian elementes indicated that the area belonged to this phytochorion (Yavari and Shahgolzari, 2010).

The results showed the geometric distribution model in the tree layers. It shows that the plant communities characterized by many low species numbers can be predict an immature plant community with low biodiversity (Magurran, 2003; Pourbabaei, 2010). The presence of 5 trees species with low frequency are confirmed. The highest value for a certain species suggests that the species is dominant in the layers. *Quercus brantii* community with *Amygdalus Scoparia* and *Pistacia atlantica* is a one of the important communities in the Oak forest. *Quercus brantii* Lindl is the only present species in the *Quercus* genus, fagaceae family. *Quercus* genus has significant ecological importance in of tree communities, especially in South Zagros mountainous with one *Quercus brantii* species. Bischetti *et al*. (2007) reported that the roots of plants plays an important role in effecting soil stability and slope protection in forests, especially in mountainous areas. The broken stick model indicative a plant community with relatively uniform frequency for all the species, the number of shrubs confirmed that this issue (Magurran, 2003). *Acer monspessulanum, Pistacia khinjuk* and *Pistacia atlantica* in tree layers and *Cerasus microcarpa, Daphne mucronata* and *Ziziphus nummularia* in shrub layers were introduced as the rare species and sites have remarkable diversity measures thus it is necessary to be considered as protected sites. In particular, shrubs play the role of a nursing tree, In particular, shrubs have the role of protecting seedlings. The normal logarithmic model indicating a plant community with rich diversity where most of the species have intermediate frequency with only a few species having very high or low frequency (Hamilton, 2005; Pourbabaei, 2010). The presence of 154 herbaceous species confirms this issue. In the current research, assessment of the frequency curves in the herbaceous layers showed a normal logarithmic distribution. Destruction has been reducing the diversity of shrub and tree species and increases grass species. It is affected by different factors such as human impact, fire, climate, topography and soil on the establishment of vegetation (herbaceous layers, shrub layers) especially shrub and tree layers (Mohtashamnia *et al*., 2007). Studies have shown that the development of the tree layer greatly depends on the methods and intensity of forest management and and use changes act (Verburg *et al*., 2004).

CONCLUSION

According to results of this study, this region is being destroyed as part of Malé Galle protected area. Therefore, plant studies will be high value, and changes are considered as a serious warning. Study on flora and geographical origin of vegetation are one of the most effective methods for conservation and management of biodiversity and sustainable forest management. For example: supporting livelihood in local communities, training programs and raising awareness of local people. In its broadest sense, sustainable forest management encompasses the administrative, legal, technical, economic, social and environmental aspects of preservation. Thus, SIV and FIV are introduced as a one of the most important indexes in forest management and the index can be useful in biodiversity conservation.

REFERENCES

[IUCN] International Union for Conservation of Nature and Natural Resources. 1976. *Proceedings of an International Meeting on Ecological Guidelines for the Use of Natural Resources in the Middle East and South West Asia*; 1975 May 24-30; Persepolis, Iran.

Asaadi AM. 2009. Floristic study of Firozeh watershed-north Khorasan Province. *Research Journal of Biological Sciences*. 4(10): 1092-1103.

Bischetti GB, Chiaradia EA, Simonato T, Speziali B, Vitali B, Vullo P, Zocco A. 2007. Root strength and root area ratio of forest species in Lombardy (Northern Italy). *Plant and Soil*. 278: 11-22.

Farzam M, Melati F, Atashgahi. 2011. Flora, life form and chorology of winter and rural range plants in the Northern Khorasan Province, Iran. *Journal of Rangeland Science*. 1(4): 269-282.

Hamilton AJ. 2005. Species diversity or biodiversity?. *Journal of Environmental Management*. 75: 89-92.

Heinrich M, Barnes J, Gibbons S, Williamson EM. 2004. Fundamentals of Pharmacognosy and Phytotherapy. London (GB): Churchill Livingstone.

Körner C, Basler D. 2010. Phenology under global warming. *Science*. 327(5972): 1461-1462.

Nadaf M, Ejtehadi H, Mesdaghi M, Farzam M. 2017. Flora, life form and chorology of plants in Jozak–Chaminbid area, North Khorassan Province, Iran. *Iranian Journal of Plant Biology*. 4(32): 69-88.

Negahdarsaber MR, Abkenar KT, Pourbabaei H, Sagheb-Talebi K. 2017. Flora, life forms and chorology of plant species in the Deh-Kohneh Forest in Sepidan, Fars Province, Iran. *Caspian Journal of Environmental Sciences*. 15(1): 67-74.

Noroozi J, Akhani H, Breckle SW. 2008. Biodiversity and phytogeography of the alpine flora of Iran. *Biodiversity and Conservation*. 17(3): 493-521.

Niknejad Y, Rezaee MB, Zakerimehr MR. 2014. Florestic investigation, life form, and distribution of medicinal plants species in Rineh area Amol. *Eco-Phytochemical Journal of Medical Plants*. 1(4): 32-43.

Magurran AE, Henderson PA. 2003. Explaining the excess of rare species in natural species abundance distributions. *Nature*. 422(6933): 714.

Moradipour L, Babaei H, Hatami A. 2018. Vegetation classification in relation to environmental factors, in Fars Province, Iran. *Journal of Biological Studies*. 1(2): 49-58.

Mohtashamnia S, Zahedi G, Arzani H. 2007. Vegetation ordination of step pic rangelands in relation to edaphical and physiographical factors (case study: Abadeh rangelands, Fars). *Rangeland*. 1(2): 142-158.

Moradkhani S, Milan BS. 2015. Floristic study of the rangeland Gugerd region in Khoy city (West Azarbaijan Province, NW Iran). *Journal of Biodiversity and Environmental Sciences*. 6(6): 48-59.

Pourbabaei H, Abedi R. 2013. Plant species groups in chestnut (*Castanea sativa* Mill) sites, Hyrcanian Forests of Iran. *Ecologia Balkanica*. 5(1): 37-47.

Parmesan C. 2007. Influences of species, latitudes and methodologies on estimates of phenological response to global warming. *Global Change Biology*. 13(9): 1860-1872.

Parmesan C, Yohe G. 2003. A globally coherent fingerprint of climate change impacts across natural systems. *Nature*. 421(6918): 37.

Pourbabaei H. 2010. *Application of Statistics in Ecology (Methods and basic calculations)*. Rasht (IR): University of Gilan.

Perry AL, Low PJ, Ellis JR, Reynolds JD. 2005. Climate change and distribution shifts in marine fishes. *Science*. 308(5730): 1912-1915.

Razavi SM, Mattaji A, Rahmani R, Naghavi F. 2012. The assessment of plant species importance value (SIV) in Beech (*Fagus orientalis*) forests of Iran (A case study: Nav district 2 of asalem, Guilan Province). *Int Res J App Basic Sci*. 3(2): 433-439.

Rios JL, Recio MC. 2005. Medicinal plants and antimicrobial activity. *Journal of Ethnopharmacology*. 100(1-2): 80-84.

Sarmiento G, Monasterio M. 1983. Life forms and phenology. *Ecosystems of the World*. 13: 79-108.

Sharma N, Kant S. 2014. Vegetation structure, floristic composition and species diversity of woody plant communities in sub-tropical Kandi Siwaliks of Jammu, J & K, India. *International Journal of Basic and Applied Sciences*. 3(4): 382.

Smith WG. 1913. Raunkiaer's "life-forms" and statistical methods. *Journal of Ecology*. 1(1):16-26.

Taber S. 1973. Influence of pollen location in the hive on its utilization by the honeybee colony. *Journal of Apicultural Research*. 12(1): 17-20.

Verburg PH, Schot PP, Dijst MJ, Veldkamp A. 2004. Land use change modelling: current practice and research priorities. *GeoJournal*. 61(4): 309-324

Valipour A, Namiraninan M, Etemad V, Ghazanfari H. 2009. Relationships between diameter, height and geographical aspects with bark thickness of Lebanon oak tree (Quercus libani Oliv.) in Armardeh, Baneh (Northern Zagros of Iran). Research Journal of Forestry. 3(1): 1-7.

Vaseghi P, Ejtehadi H, Zokaii M, Joharchi MR. 2007. Study of floristics, vegetation structure and chorology of plants in Kalat highlands of Gonabad, Khorasan Province, east of Iran. *Journal of Science of Tarbiat Moalem University*. 8: 75-88.

Veiskarami Z, Pilehvar B, Soosani, J, Veiskarami GH, Zeinivand H. 2012. Study of flora, life form and chorology of perk forest in Lorestan province, Iran. *Natural Ecosystems of Iran*. 3(1): 27-28.

Yavari A, Shahgolzari SM. 2010. Floristic study of Khan-Gormaz protected area in Hamadan Province, Iran. *Int J Agric Biol*. 12: 271-275.