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RESEARCH ARTICLE

Floristic, chorological and biological form of some plants in part of Lar National Park, Iran with emphasis on *Asteraceae, Poaceae,* and *Lamiaceae*

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Abstract

Lar National Park, one of the most beautiful plains, 70 km east of Tehran on Haraz Road, is one of the protected areas of Iran which is located on the border of Tehran and Mazandaran provinces. Since Lar National Park is protected by the Environment Organization and for this reason, any harvesting of plants or entry of some areas is prohibited, so this study was conducted to prepare a list and vegetative form of some of its plants for the knowledge of botanists which relates to a small part of Lar National Park. For the floristic study of this part of the region, samples were collected from June to September in 2017-2018, which 30 family were identified. The floristic study of plants in the Lar region shows that 3 families have the highest frequency. Also, our result is compared with the Poloor region in which two areas were close to each other in terms of the dry season. In terms of plant species identification, it shows that the Lar plain region as Poloor region is one of the largest families of the region *Astraceae*, *Poaceae* and *Lamiaceae*, study of biological form and chorology, and frequency of three families in Lar region and compares it with the adjacent area which is Poloor.

Keywords: Lar National Park, flora, chorology, biological form, compare

Introduction

The flora of each city depends on the culture, customs and traditions, and social and even economic issues of its people. Therefore, access to past documents, i.e. the effects and the consequences of these developments are essential. Since the 16th century, many researchers have considered collecting and describe the plants of Southwest Asia.

Iran is one of the most important countries in that it has a lot of plant diversity because of the vastness of climatic diversity and topography. This led many naturalists, especially botanists to travel to this region to collect and study plants (Rostami 2013). Iran rich flora is one of the most attractive vegetation among the countries of Southwest Asia and is because of its large vastness, climatic diversity, and special topography. Knowledge of habitats and plant communities in each region is of great importance in the forage, pharmaceutical, industrial fields, and ecological research and management of the region (Khosroshahi et al. 2009). In general, Iran, being in a special geographical position and having special topographic conditions, the existence of the Alborz and Zagros mountain ranges in two different directions, the existence of vast deserts and plains and its location in a relatively wide range of geographical latitudes, has special climatic conditions.

Lar National Park is one of the protected areas in Iran that has high mountain and aquatic ecosystems. This region is located in the central Alborz mountain range near the southwestern hillside of Damavand and on the border of Tehran and Mazandaran provinces, it is one of the regions where no arranged floristic and plant sociological work has been done in it so far. It has 73500 hectares and in this study, only a part of Lar National Park was studied. Therefore, to identify the region and prepare a list of its plants, we started to collect and identify the plants of the region based on available sources and by

the conventional taxonomic method (Esmailzadeh et al. 2005). Another of the aim of this study was to determine the biological form of plants which hemicryptophytes have the highest frequency. Also, it was done to compare the taxa of Lar National Park with the Poloor region in Iran (Moradi et al. 2011). It has an area close to Lar protected area. This region is also like the Lar region in Alborz mountain range and near Lar area is one of the high and mountainous regions.

Materials and Methods

The plant samples collection

National Park is one of the protected areas of Iran. It is located between Tehran and Mazandaran provinces, in the position of 54.35 north latitude and 33.51 east longitude and its area is about 73500 hectares. Considering that the mentioned region is in the list of protected and hunting prohibited areas of Iran Environment Organization, therefore, entry into the region is unrestricted only between June and September. Therefore, the collection of plants in the area lasted from June 2017 to the end of September 2017 and also from June 2018 to the end of September 2018. Plant samples were collected every 15 days in growing seasons and longitude, latitude and altitude, and date of the collection were recorded for each sample, and photographs were taken from different parts of the samples. All collected samples were transferred to each Herbarium of the National Botanical Garden of Iran and identification of plant species, and biological form of the species was determined by using existing valid botanical sources such as Raunkiaer system (Lehmann et al. 2014); Iranica flora (Rechinger 1973), and Turkish flora (Davis 1965). Then, the chorotype of the species was determined from the plant species distributions based on a combination of plant geographical division of the Iranian plateau by (Zohary 1973). Monotypic genera and rare species in the region were identified using the book of Iran's plant biodiversity (Ghahreman and Attar 1999), and Iran's exclusive Arrays and Arrays in the IVCN Red List were determined from Red data book of (Jalili 1999) and Iran's Plant Biodiversity book (Ghahermaninejad and Nafisi 2011). The names of the authors and arrays were matched to the International Plant Name Index. Table of arrays in the Red List and the International Union for the Conservation of Nature (IUCN). Also, our result is compared with the Poloor region. It has an area close to Lar protected area. The drawing ombrothermic diagrams were analysed with Excel software.

Results

Identification of plant species

In the present study, the flora of Lar National Park was studied for the first time which 30 family, were identified, thus, the families of *Asteraceae*, *Lamiaceae*, *Poaceae*, *Apiaceae* and *Liliaceae* with 34, 27, 16, 16 and 9 species, respectively are the largest genera in terms of species frequency in the region and the two family *Juncaceae* and *Malvaceae* have the lowest frequency. *Juncaceae* is a family of flowering plants, commonly known as the rush family and they often grow on infertile soils in a wide range of moisture conditions. Most of the *Juncus* species grow exclusively in wetland habitats (Xu and Le 2017). *Malvaceae* and the latitudinal gradient in species diversity temperate lineages of *Malvaceae* (or at least those groups that contain species with a temperate distribution) are nested within tropical ones, consistent with this pattern that was demonstrated by (Judd et al. 1994). The chorotype of the species was determined from the plant species distributions based on a combination of plant geographical division of the Iranian plateau by (Zohary 1973) (Tab. 1.). Seven of families with the highest number of species are among the richest families in this region, which are listed in the Tab. 2.

Hemicryptophyte is one of Raunkiaer's life-form categories, being a plant whose perennating buds are at ground level, the aerial shoots dying down at the onset of unfavorable conditions. Therophytes is a collection of annual plants whose growth period and completion of their life cycle in one year or Lower. The main difference between this group and other groups is that the next year's productive bud, from Shrubs, are cut and seeded and in the unfavourable season of the year only the rest of the year is before. The hydrophytes: plants whose organs and buds are constantly immersed in water, such as lotus. Geophytes: plants whose winter sprouts are in the soil, types of onions, and tubers. Its species can be used as medicinal and aromatic plants (Seyidoğlu and Yayım 2009).

Vegetative buds of hemicryptophytes are located between the leaves and the soil surface in winter, and as a result, show great resistance to cold weather (Omidipoor et al. 2018; Ganji 2016). Also, the presence of therophytes and the reason for their increases could be due to uncontrolled livestock grazing, road construction, and human intervention, etc., that sensitive species would be destroyed and the presence of invasive and annual plants would be increased in the area. The richest geographical locations in this region are Irano-Turani. According to De Martonne Aridity Index and data obtained from Damavand and Abali stations, this region has semi-humid and humid climates, respectively. From the ombrothermic diagram of Damavand and Abali stations, it is clear that Damavand station is dry for six months of the year and the relevant season starts from early December and lasts until mid-May, and Abali stations are dry for four months of the year and the humid season begins in mid-September and lasts until mid-May (Fig. 1. and 2.). Climate classification

De Martonne is based on the Aridity Index and in it from temperature and rainfall, used to determine the type of climate. De Martonne presented the experimental equation (I=P/t+10) to determine the type of climate of a region (I: drought index; P: average annual rainfall in millimetre and t: average annual temperature in degrees Celsius). In Climate classification De Martonne system, De Martonne identified six types of climates which they are: dry climate which in this climate, the drought index is less than 10; for semi-arid climate is between 10 and 20, for the Mediterranean climate is between 20 and 24, for semi-humid climate is in the range between 24 and 28, to humid climate is in the range between 28 and 35, and very humid climate is greater than or equal to 35 (Habibi et al. 2009).

Table 1. Introduction of biological forms and geographical distribution of plant species based on Raunkiaer classification.

Biological form	Geographical distribution
Ph: Phanrophytes	IT: Iran - Turani
Ch: Chamaephytes	SS: Sahara-Sandy
He: Hemicryptophytes	ES: Europe - Siberia
Ge: Geophytes	M: Mediterranean
Th: Therophytes	Cosm: Cosmopolitan

Table 2. List of rich family in the area of study.

Family	Number of genders	Number of species
Asteraceae	34	42
Lamiaceae	27	30
Poaceae	16	22

The ombrothermic curve was invented by Goosen. This curve is compared to show monthly temperature changes compared to monthly rainfall changes throughout the year. In this diagram, the selected scale is such that the number related to the rainfall divisions (in mm) is twice the number related to the temperature (in terms of Celsius), by selecting this scale, it is possible to determine the dry months when p is less than 2T. That is, it is possible when the temperature is above the rainfall curve (Babaei and Najafpour 2014). The importance of the method is unavoidable, because instead of two diagrams, one diagram is drawn, and it also enables a new awareness of drought. This chart is suitable for temperate areas where rainfall is average (Khaledi 1996). As a result, an ombrothermic diagram is prepared to identify the dry months in the studied climatic station (Farajzadeh 2012). Humidity Index (humidex for short) is an index used by Canadian meteorologists to describe how the average person feels about temperature. In this index, two factors of temperature and humidity are taken into account. This index is a unit less quantity and is equivalent to the dry temperature based on Celsius. For example, if the temperature is 30°C and the humidity index is 40, it can be concluded that the temperature felt by the person in this humidity is equal to 40°C in dry conditions (Ghaedi and Mossaedi 2013).

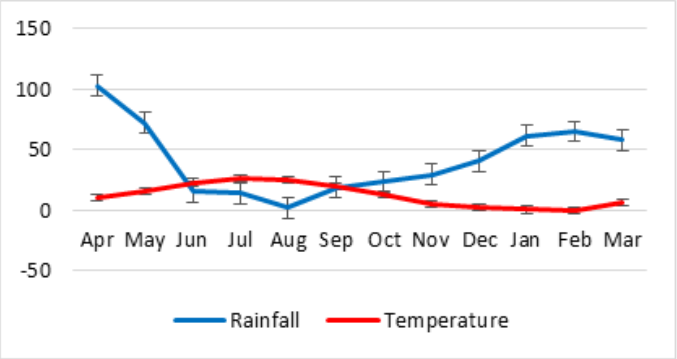

Figure 1. Ombrothermic diagram of Damavand synoptic station.

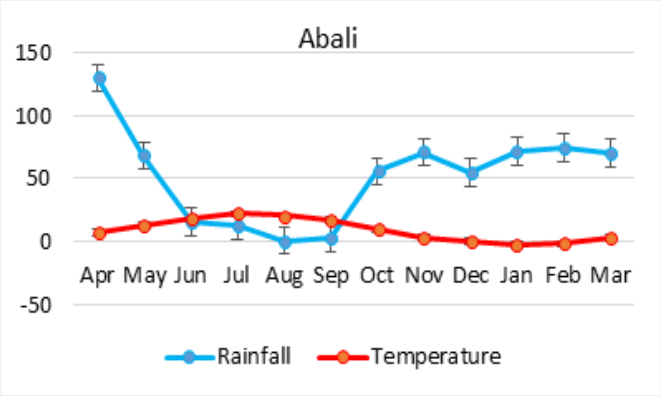

Figure 2. Ombrothermic diagram of Abali synoptic station.

Synoptic is a Greek word meaning synoptic, synonymous, and modern. In meteorology, the term refers to the use of meteorological information obtained simultaneously over a wide area to provide a comprehensive, almost instantaneous picture of the atmosphere. Thus, for a meteorologist, "synoptic" means considering complementary meteorological concepts and additional information at the same time (Safarzaii and Safarzaii 2013). From the study of Iranica flora, the flora of Iran and all floristic articles mentioned in this article, it is concluded that according to the ombrothermic curve in this region, dryness is between June and September, on the other hand, the region is a semi-mountainous and the presence of therophytes and hemicryptophytes plants in the biological spectrum of these drought conditions are compatible (Tavakoli et al. 2013). The study of the biological form of 3 families in the region shows that hemicryptophytes with 51/21% have the highest frequency, and then Therophytes with 29/26% and Chamaephytes with 15/85% are in the next ranks (Fig. 3.).

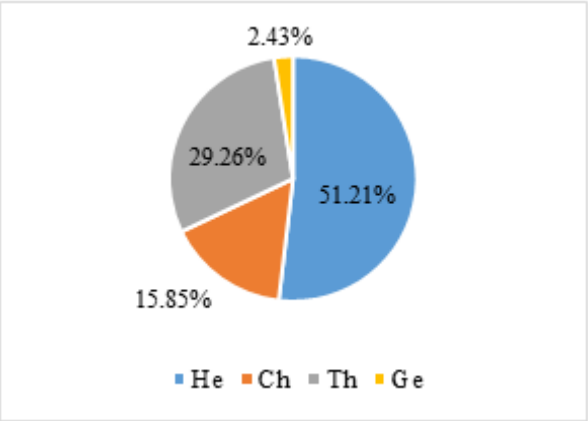

Figure 3. Frequency diagram of the plant's biological forms in Lar protected area. He: Hemicryptophytes (being a plant whose perennating buds are at ground level); Ch: Chamaephytes; Ge: Geophytes (plants whose winter sprouts are in the soil, types of onions and tubers); Th: Therophytes: (are annual plants that complete their life cycle in a short period when conditions are favourable and survive harsh conditions as seeds).

Elements of the Irano-Turanian Region, Irano-Turonian-Mediterranean region, Irano-Turonian-Siberian region, Irano-Turonian-Siberian-Mediterranean region, Irano-Turonian-Sahara-Sandy region, the Mediterranean region, Irano-Turanian and Sahara-Sandy region, several regions and homeland region are 66/66%, 7/14%, 4/76%, 2/38%, 1/19%, respectively (Fig. 4.). The pictures of some species are presented (Fig. 5.). Tab. 3. provides the introduction of biological form and chorology of plant species in 3 families collected from part of Lar protected area. The biological form shows the adaptation of plants to environmental factors as well as their systematic characteristics. According to the results, hemicryptophytes indicate a cold and mountainous climate. Plant chronological evaluation of Lar National Park shows that the area geographically belongs to one to several plant geographical areas.

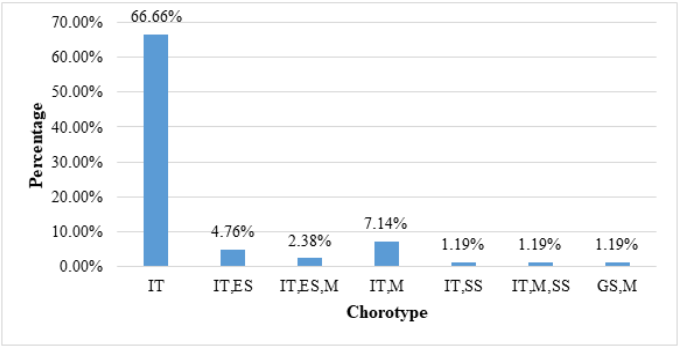

Figure 4. Diagram of the chorotype percentage species of *Asteraceae*, *Poaceae*, and *Lamiaceae*.

There are about 600 genera in the family of *Asteraceae* (formerly Compositae), including various types of asters (daisies), arnica, chamomile, goldeneye, marigold, snakeroot, tansy, thistle, and wormwood (Aronson 2016). The *Lamiaceae* or *Labiatae* are a family of flowering plants with a cosmopolitan distribution containing 236 genera and has been stated to contain 6900–7200 species, also belonging to *Lamiaceae*, is a famous culinary herb in Africa. It is medicinally used in case of diarrhoea as well as hypoglycaemic, anti-inflammatory, antibacterial, antioxidant, immune-stimulatory, and antiviral. The grass family (*Gramineae* or *Poaceae*) is economically and ecologically the most important of the families of flowering plants; members of the family such as maize, wheat, and rice provide about half of the caloric consumption of humanity. Many kinds of grass also use high-efficiency (C4) photosynthesis, a pathway that has originated many times independently within the family (Maloy and Hughes 2013).

In this study, some species *Asteraceae*, *Poaceae*, and *Lamiaceae* which have more taxa than other family are described: *Centaurea iberica* Trevir and Spreng, *Centaurea virgata* Lamarck, *Artemisia chamemillifolia* Vill, and *Taraxacum officinale* (L.) Weber ex F.H. Wigg, are belong to *Asteraceae* family which they have described the following: *Centaurea iberica* Trevir and Spreng has variable tall with 20 cm-200 cm, stems are one or several divaricately much-branched (bushy in some references), often forming a rounded mound, puberulent to loosely tomentose. Proximal leaves petiolate, blades 10 cm-20 cm, margins 1-2 times pinnately lobed or dissected, and rosette with central cluster of spines.

Centaurea virgata Lamarck is a perennial forb that can grow 12 inch-18 inch (30.5 cm-45.7 cm) tall. This species is sometimes confused with diffuse knapweed (*Centaurea diffusa*) but can be distinguished from *Centaurea diffusa* by the floral bracts. Bracts on *Centaurea virgata* are curved outward and are not laterally toothed. *Artemisia chamemillifolia* Vill, the species flowering stems are 30 cm–50 cm (12 inch–20 inch) in length and it's cylindrical, erect, and dark brown. Leaves are pinnatisect, green-colored, and either hairless or they have a minimum amount of it. Leaf-lobes are 2 mm–4 mm (0.079 inch–0.157 inch) by 0.5 mm (0.020 inch). *Taraxacum officinale* (L.) Weber ex F.H., wigg grows from generally unbranched taproots and produces one to more than ten stems that are typically 5 cm–40 cm (2.0 inch–15.7 inch) tall, but sometimes up to 70 cm (28 inch) tall. The stems can be tinted purplish; they are upright or lax and produce flower heads that are held tall or taller than the foliage. *Trisetum flavescens* (L.) *P. beauv* is a species that belong to *Poaceae* family. It is perennial bunchgrass growing in clumps up to 60 cm–80 cm (24 inch–31 inch) tall, and known to exceed 1 metre (3.3 ft.) at times. The inflorescence is a narrow panicle that is greenish-yellow to purple when new and ages to bright golden yellow. The grass is susceptible to Yellow Oat Grass Mosaic Virus (YOGMV), a virus of genus *Tritimovirus*. *Hordeum murinum* L., is a species belong to

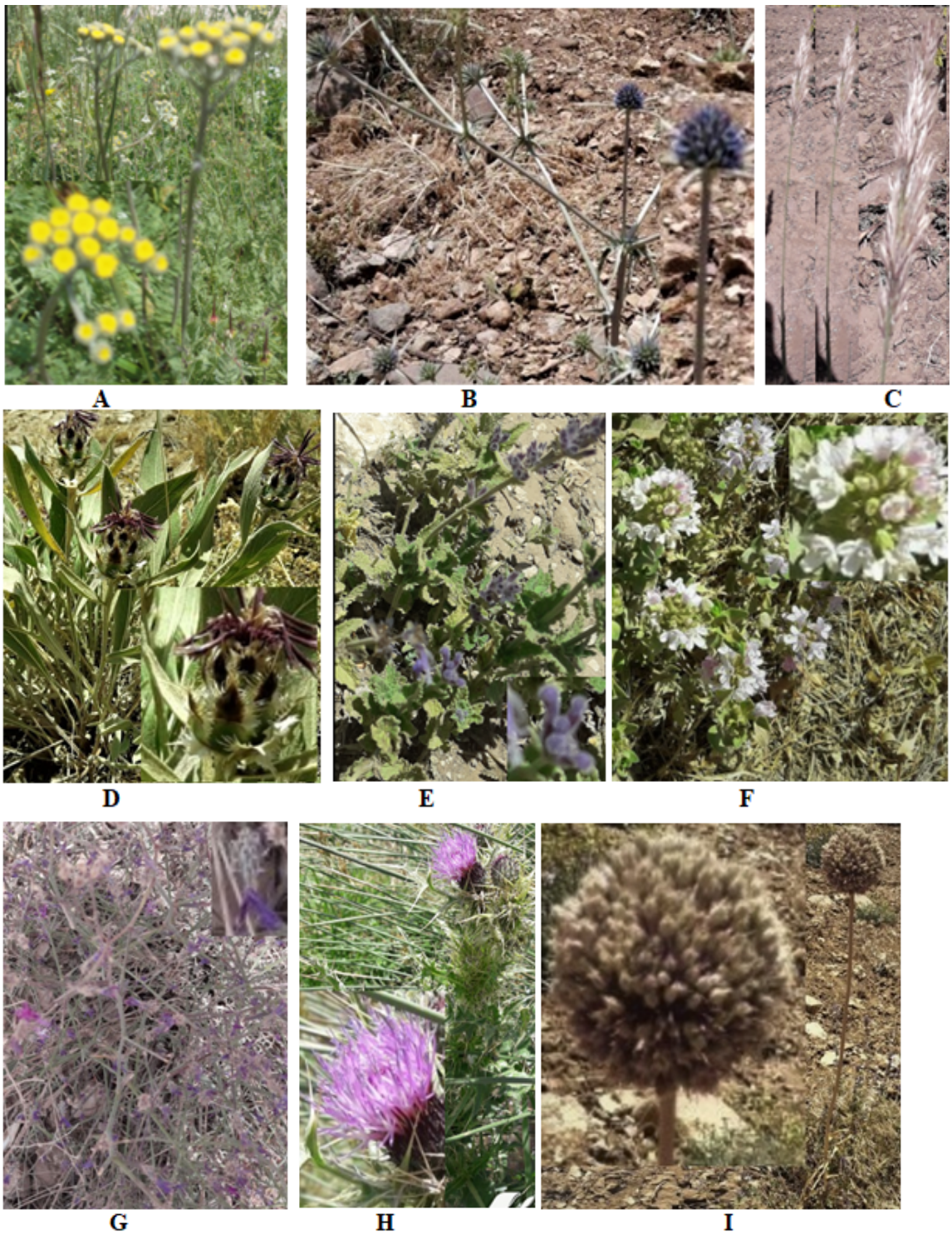

Figure 5. The pictures of some species are presented. A: *Tanacetum myrriophylum*; B: *Eryngium billardieri*; C: *Trisetum flavescens*; D: *Centaurea persica*; E: *Bromus tonentellus*; F: *Thymus pubescens*; G: *Provskia abrotanoides*; H: *Centaurea iberica*; I: *Echinops cephalotes*.

Poaceae family, and quite widespread and common. It flowers from May through July in mainly coastal areas. It can grow until 30 cm in height, and its unbranched spikes can reach 10 cm long. It is an annual winter species whose seeds germinate and develop in the spring. *Melica persica* Kunth., is perennial and caespitose with elongated rhizomes. Its culms are erect 15 cm–50 cm (5.9 inch–19.7 inch) long. Both leaf-sheaths and leaf-blades have a glabrous surface. The panicle is linear, spiciform, secund, and is 3.5 cm–12 cm, flowers are fleshy, oblong, and truncate, have two lodicules, and grow together. They have three anthers with fruits that they are caryopsis. It belongs to *Poaceae* family. *Nepeta betonicifolia* C.A. Mey., is a species of *Lamiaceae* family which most of the species are herbaceous perennial plants, but some are annuals. They have sturdy stems with opposite heart-shaped, green to grey-green leaves. Nepeta plants are usually aromatic in foliage and flowers.

Table 3. Introduction of biological form and chorology of plant species collected from study area. Note: b.f.: biological form; g.f.: geographical distribution; Ch: chamaeophyte; Ge: Geophytes; Th: therophytes; IT: Iran-Turani; SS: Sahara-Sandy; ES: Europe-Siberia; M: Mediterranean; and Cosm: cosmopolitan.

Family	Gender	Kind	b.f.	g.d.
Lamiaceae	*nepeta*	*kronenburgii*	He	IT
Lamiaceae	*thymus*	*pubescens*	He	IT
Lamiaceae	*thymus*	*vulgaris*	He	IT
Lamiaceae	*nepeta*	*bronenburgii*	He	IT
Lamiaceae	*thymus*	*migricus*	He	IT
Lamiaceae	*salivia*	*sclarea*	He	IT
Lamiaceae	*lycopus*	*europeus*	Ge	IT-ES
Lamiaceae	*stachys*	*lavandulifolia*	He	IT
Lamiaceae	*nepeta*	*persica*	He	IT
Lamiaceae	*thymus*	*transcaucasicus*	He	IT
Lamiaceae	*plomis*	*oliveri*	He	IT
Lamiaceae	*ziziphora*	*chinopodioides*	He	IT
Lamiaceae	*plomis*	*lychnitis*	He	IT
Lamiaceae	*nepeta*	*allotria*	He	IT
Lamiaceae	*nepeta*	*meyeri*	He	IT
Lamiaceae	*phlomis*	*ewiptica*	He	IT
Lamiaceae	*perovshia*	*abrotanoides*	Ge	IT
Lamiaceae	*menthe*	*pulegium*	He	IT-ES-M
Lamiaceae	*thymus*	*fedtschenkoai*	He	It
Lamiaceae	*nepeta*	*sp.l*	He	It
Lamiaceae	*phlomis*	*herbaenti*	He	It
Lamiaceae	*scutellaria*	*pekinensis*	He	It
Lamiaceae	*stachys*	*sylvatica*	He	It
Lamiaceae	*thymus*	*kotschyanus*	He	It
Lamiaceae	*vitex*	*pinnata*	He	It
Lamiaceae	*vitex*	*trifoliya*	He	It
Lamiaceae	*lavandula*	*angustifolia*	Th	IT-ES
Poaceae	*trisetum*	*flavescens*	Th	IT
Poaceae	*alopecurus*	*pratensis*	He	IT,M,SS
Poaceae	*hordeum*	*glaucum*	Ch	IT,M
Poaceae	*doctylis*	*glomerata*	Ch	COSM
Poaceae	*bromus*	*tomentellus*	Th	COSM
Poaceae	*melica*	*persica*	Ch	COSM
Poaceae	*panicum*	*agrostoidea*	Th	COSM
Poaceae	*bromus*	*pubescens*	Th	COSM
Poaceae	*bromus*	*danthoniae*	Th	COSM
Poaceae	*bromus*	*squarrosa*	Th	COSM
Poaceae	*bromus*	*graciuimus*	Th	COSM
Poaceae	*pactylis*	*marina*	Ch	IT
Poaceae	*melica*	*uniflora*	Ch	COSM
Poaceae	*melica*	*jacquemontii*	Ch	COSM
Poaceae	*violaceum*	*pennisetum*	Th	IT
Poaceae	*hordeum*	*violaceum*	Ch	IT,M
Asteraceae	*centaurea*	*iberia*	Th	IT
Asteraceae	*picris*	*strigosa*	Th	IT
Asteraceae	*centaurea*	*persica*	Th	IT
Asteraceae	*centaurea*	*virgata*	Ch	IT
Asteraceae	*helichrysum*	*plicatum*	He	IT
Asteraceae	*artemisia*	*chamemillifolia*	He	IT
Asteraceae	*chondrilla*	*jancea*	Th	IT,ES
Asteraceae	*tanacetum*	*polycephalum*	He	IT
Asteraceae	*centaurea*	*cyanus*	Th	IT
Asteraceae	*taraxacum*	*bessara bicum*	He	IT
Asteraceae	*inula*	*oculus-christii*	He	IT,M
Asteraceae	*cousinia*	*crispa*	Ch	IT
Asteraceae	*anthemis*	*arvensis*	Th	IT,SS
Asteraceae	*cousinia*	*microcarpa*	Th	IT
Asteraceae	*conyza*	*ramosisima*	Th	IT
Asteraceae	*trapagon*	*clubius*	He	IT
Asteraceae	*tanacetum*	*vulgare*	Th	IT
Asteraceae	*echinops*	*cephalotes*	Ch	IT,M
Asteraceae	*chondrilla*	*juncea*	Th	IT.ES
Asteraceae	*taraxacum*	*officinale*	He	IT
Asteraceae	*tanacetum*	*myrriophyllum*	He	IT
Asteraceae	*senecia*	*vernalis*	He	IT
Asteraceae	*tripleurospermum*	*disciforme*	He	IT
Asteraceae	*seecia*	*vulgaris*	He	IT
Asteraceae	*artermisia*	*chamemillitolia*	He	IT
Asteraceae	*cota*	*tinctoric*	Ch	IT
Asteraceae	*centaurea*	*centarium.l.*	Th	IT
Asteraceae	*centaurea*	*aucheri*	Th	IT
Asteraceae	*centaurea*	*depressa*	Th	IT,M,ES
Asteraceae	*centaurea*	*inula*	Th	IT
Asteraceae	*helichrysum*	*arenarium*	He	IT
Asteraceae	*helichrysum*	*globiterm*	He	IT
Asteraceae	*taraxacum*	*operozon*	Ch	IT
Asteraceae	*inula*	*helenium*	He	IT,M
Poaceae	*bromus*	*danthoniae*	Th	PL
Lamiaceae	*Salvia*	*staminea*	He	IT
Lamiaceae	*Perovskia*	*abrotanoides*	He	IT
Poaceae	*Alopecurus*	*alpinus*	Th	PI
Poaceae	*Agrostis*	*olympica*	Ch	ES,M

Thymus pubescens Boiss and Kotschy ex Celak is a species of aromatic perennial herbaceous plants and subshrubs which has to 40 cm tall in the family *Lamiaceae*, native to temperate regions in Europe, North Africa, and Asia. *Thymus vulgaris* L., is a species of flowering plant in the mint family *Lamiaceae*, native to southern Europe from the western Mediterranean to southern Italy, Growing to 15 cm–30 cm (6 in–12 in) tall by 40 cm (16 inch) wide.

A study conducted on a part of the Poloor region by Moradi et al. (2011), between April and June, which information was obtained. This region is also like Lar region in Alborz mountain range and near Lar and like Lar is one of the high and mountainous regions. According to the ombrothermic curve obtained from this region, the dry season is from the end of June to the end of September, and in terms of biological distribution, the highest distribution is related to the Iranian region of Turani, which is about 55%. In terms of biological forms, this region has 51% hemicryptophytes, 24.6% trophites, geophytes, and phenophytes with 8.7% and comfits with 7% of other biological forms in the region. In this region, as well as in Lar region, *Poaceae*, *Asteraceae*, and *Lamiaceae* are the most important plant family in the region, respectively. In the present study, it was only carried out on a part of Lar National Park. According to the ombrothermic curve obtained from Damavand station from June to September, which shows the two areas are close to each other in terms of the dry season. In terms of plant species identification, it shows that the Lar plain region is one of the greatest families of

the region *Astraceae, Poaceae,* and *Lamiaceae*. According to studies conducted in the Poloor region, 157 genera and 276 species were identified (Moradi et al. 2011), which *Poaceae, Asteraceae,* and *Lamiaceae* are the most important plant species, which our results are the same as the results of their study. Also, according to a study conducted in a part of Lar National Park as the Poloor region, hemicryptophytes have the highest frequency, and the highest geographical distribution is related to the Iranian region of Turani.

Conclusion

This region, due to being located on the border of several different plant geographical regions, has a high ratio of elements of two or more regions, more than half of the plants have the distribution of Irano-Turonian. The high frequency of taxa belonging to the *Asteraceae* family can be attributed to the degradation of the region and various environmental conditions so that when the degradation of vegetation is high (livestock grazing), the presence of some families including *Asteraceae* will be increased in the region. The flora of Lar National Park area was studied for the first time during which 30 families distinguished from the part of Lar Park that *Asteraceae* with 42 species, *Lamiaceae* with 30 species, and *Poaceae* with 22 species are the most of species abundance, respectively. It is important to compare the flora of different area of Iran which has a similar environmental condition. In the flora of the Poloor region, *Poaceae* with 45 species, *Asteraceae* 37 species, and *Lamiaceae* 22 species were the highest similar to our study. The collection of plant species was considered only as a small part of Lar Park plants and its completion and preparation of flora require further studies over a longer period. In this research, due to the time limit, only a doctoral dissertation was studied and the plants of the region were studied and it should not be generalized to the whole Lar National Park. In the present study, it was carried out on a part of Lar National Park according to the ombrothermic curve obtained from Damavand station from June to September, which shows that the two areas are close to each other in terms of the dry season. Also, according to a study conducted in a part of Lar National Park, hemicryptophytes have the highest frequency. And the highest geographical distribution is related to the Iranian region of Turani.

The results of this study can provide valuable information about the protection of vegetative elements in the region and also principled planning for the stability and sustainability of similar ecosystems can only be done through this basic information in which plants are the main elements.

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