



<https://tbj.ui.ac.ir>

Taxonomy and Biosystematics

E-ISSN: 2322-2190

Document Type: Research Paper

Vol. 15, Issue 4, No. 57, (2024), P:91-106

Received: 14/04/2024

Accepted: 28/04/2024

Research Paper

Floristic Study and Conservation Status of Takhte-Sartashtak Tourist Area in Kerman, Iran

Leila Malekpourzadeh

Ph.D. Student, Department of Plant Sciences, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
malekpour.leila@yahoo.com

Farrokh Ghahremaninejad* 

Professor, Department of Plant Sciences, Faculty of Biological Sciences, Kharazmi University, Tehran, Iran
fgh@khu.ac.ir

Mansour Mirtadzadini

Associate Professor, Department of Biology, Faculty of Science, Shahid Bahonar University of Kerman, Kerman, Iran
mirtadzadini@yahoo.com

Abstract

Due to the high climatic diversity, Iran has a very rich flora, 20 to 25% of which is endemic to Iran. Of the 34 centers of endemism in the world, five centers are located in Iran; most of them belong to high and mountainous areas. Flora, plant diversity and conservation status of the tourism area of Takhte-Sartashtak in the southeast of Iran have been studied. The area is located in the southwest of Kerman province. Its average altitude is 3600 m above sea level, the range of the longitude is 57° 6' to 57° 14' and latitude is 29° 16' to 29° 23'. This area is mountainous and a part of the Irano-Turanian region. Nearly, all wild vascular plants species of the area were collected and identified. Life form, chorotype, phenology, and medicinal use were determined. A total of 306 plant species of 49 families with 195 genera were determined. Asteraceae with 51 species and *Astragalus* with 13 species were the largest family and genus respectively. There are 60 (19.6%) endemic and 46 (15.03%) rare identified plant taxa in this area. Because of various climatic conditions, different altitudes, and the creation of micro and macro-climates in the region, some species with various natures were seen. The conservation status of all plant species of the area in the world was determined using GeoCat online software; 191 (62.42%) plant species were identified as threatened, of which, 24 (7.85%) species are classified as Critically Endangered (CR), 114 (37.25%) Endangered (EN), and 53 (17.32%) Vulnerable (VU).

Key Words: Flora, Diversity, Protected area, Tourist Attraction, Iran.

Introduction

Iran encompasses a vast and diverse area of South West Asia, this area has a rich flora and characteristic elements related to its major phytochoria, *i.e.*, Irano-Turanian, Euxine-Hyrcanian, and Saharo-Sindian (Mousavi et al., 2020). The high diversity of vegetation in Iran is primarily due to its climatic diversity. Investigation and determination of the vegetation and flora of Iran are one of the goals of plant scientists and botanists. However, some parts of the country have not been studied in detail.

The results obtained from around the world have shown that the rate of extinction and extinction of plant species is much faster than expected (Pimm, et al., 1995). According to the IUCN (International Union for Conservation of Nature), many plant species in the world have medicinal uses (Bentley, 2010), of which 20% are endangered (Ross, 2005). Fortunately, various ways to conserve and use plants properly have been studied (Larsen & Olsen, 2007; Uprety et al., 2012). One of the most important ways to protect plants is to first list the plant species and then check the status of their protection, which is certainly the best way to list floristic research. Therefore, conducting floristic research and using identification keys can be very useful and valuable (Majnounian, 1998; Ghahreman

*Corresponding author

Malekpourzadeh, L., Ghahremaninejad, F., & Mirtadzadini, S. M. (2024). Floristic Study and Conservation Status of Takhte-Sartashtak Tourist Area in Kerman, Iran. *Taxonomy and Biosystematics*, 57(4), 91-106.



2322-2190 © The Author(s). Published by University of Isfahn

This is an open access article under the CC BY-NC 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0>).



<http://dx.doi.org/10.22108/TBJ.2024.141181.1256>

& Attar, 1999; Campbell, et al., 2003).

Many floristic works have been done in various parts of Iran; as examples, some floristic study in Lissar and Sorkhabad protected areas (Moghanloo et al., 2023; Ghahremaninejad et al., 2012), in Damilrli Mountains (Mahmoodi et al., 2022), in Bazarjan Region (Mohammadi et al., 2021), in Khabr National Park & Rouchoun Wildlife Refuge (Edmondson et al., 1980; Irannejad Parizi, et al., 2002), in Hezar Mountain (Rajaei, et al., 2011), in Sabalan altitudes (Alizadeh et al., 2024), in Riseh and Paghaleh areas (Saberi, et al., 2013), in Hanza Kooh (Payandeh, et al., 2015), in Raas Kooh area (Malekpourzadeh, et al., 2015), etc. The high number of plant species and the percentage of endemic and rare species indicate high species diversity in the region. However, there are many other areas where there is less or no work. It is worth mentioning that, by doing botanical studies in each region and comparing with past studies, the process of natural changes in the ecosystem can be studied and if there were any possible destruction by humans, suggested ways to control the ecosystem and finally, by defining the vegetation of each region, one can take a step toward determining the flora of Iran and the world, which has long been a concern for botanists and other scientists.

Kerman is the largest province of Iran. In of phytogeography, it is located in the Irano-Turanian region, which has two main parts, plain and mountainous (Zohari, 1973). Kerman province is geologically located in the central zone of Iran and in its eastern part it is connected with Lut Block which is a part of the eastern and southeastern zones of Iran. Kerman region is structurally divided into several structural units (Dimitrijevic, 1973). There are diverse types of cold, hot and temperate climates in different parts of this province. Given that the overall feature of Kerman province is desert, the rich flora of its mountainous regions holds significant ecological and ecosystem service importance. One of the high and mountainous areas of the province named "Takhte-Sartashtak". This area, in addition to hosting nomadic tribes, attract a considerable number of tourists. The area of Takhte-Sartashtak has the basic capacity to set up a ski rink on grass and snow. The duration of snow for the ski resort depends on the amount of snowfall in the year, which has been different with some droughts in recent years. However, it can be said on average that the area is suitable for skiing for at least one month in terms of snow cover. This area is one of the most important tourist areas of the country with a natural tourism approach. Human interventions along with climate change threaten the species diversity of these regions. To preserve the diversity of plant species, efforts have been focused on conducting floristic studies in the Takhte-Sartashtak Mountainous area. Therefore, the main objective of this study is to compile a list of all plant species, including those that are threatened.

Materials and Methods

Study area

Takhte-Sartashtak region is one of the summer regions and one of the tourist attractions in the heights of Hezar and Lalehzar Mountains, which attracts many tourists every year (Figure 1). The region in question is located in the southeast of Iran, near the cities of Rabar, Baft, and Jiroft; and in the southwest of Kerman province. The altitude range in the region is from 2300 to 3800 and the average is 3600 meters above sea level. The average rainfall is 360 mm and the temperature fluctuates between -15 and +26 degrees Celsius. Lalehzar and Hezar Mountains, surrounding areas of this region, are considered as a part of the Yazd-Kerman endemism center. It is noteworthy that out of nearly 34 endemism centers around the world, the study area is part of one endemism center and therefore is very significant (Iran Meteorological Organization, 2000-2016). The ombrothermic curve of Baft city during the statistical period of 2000-2016 shown in Figure 2 (Iran Meteorological Organization, 2017). The longitude range is from 57° 6' to 57° 14' and latitude range is from 29° 16' to 29° 23' and included almost 40,000 hectares.

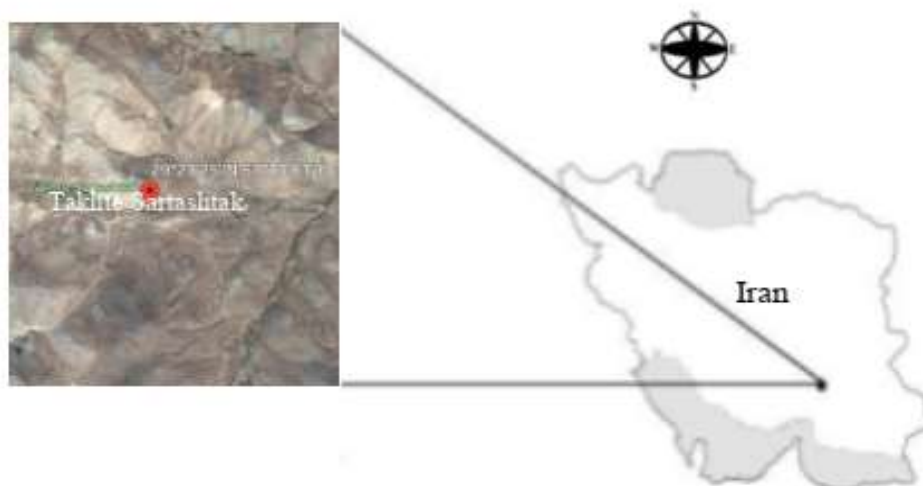


Figure 1: The geographical location of the studied area along with the aerial photograph (scale: 1cm=400km), (Google Earth, 2019).



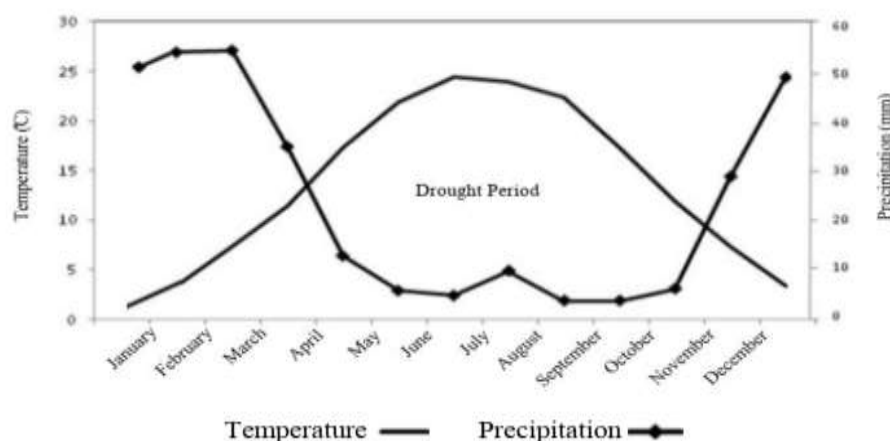


Figure 2: Ombrothermic curve of Baft city during the statistical period of 2000-2016 (Iran Meteorological Organization, 2017).

Data collection

The study area was identified using a topographic map (scale 1: 250,000) and GPS (Global Positioning System), then its boundaries were determined (Geographical Organization of the Armed Forces, 2010). During three consecutive years growing seasons, 2017 to 2019, nearly all wild plants taxa in the mountainous and highlands of Takhte-Sartashtak and the surrounding areas, including Hanza, Bandar Hanza, Sarmashk, Roghan House, Glouchar, and Baghoyeh, were collected. After the fieldwork, all steps related to the preparation of herbarium specimens carried out at the botanical laboratory for the determination. A herbarium number was assigned to each sheet and all archived in Tehran Herbarium (T) at the Kharazmi University (Tehran) (herbarium acronyms follow Thiers 2024+). The scientific names of the plants were verified using "POWO" website. Collected plants were identified by using Flora Iranica (Rechinger, 1963-2015), Flora of Turkey (Davis, 1965-1988), Flora of Iraq (Townsend, 1966-1985), Flora of Iran (Assadi, 1989-2023; Ghahreman, 1984-2008), Iranian *Astragalus* literatures (Ghahremaninejad, 2004; Maassoumi, 1987-2006; Podlech & Zarre, 2013), Vegetatives of Iran (Mobayen, 1976-1996), Checklist of Iranian grasses (Bidarlord & Ghahremaninejad, 2022). The growth forms and chorotype (Raunkiaer, 1934; Majnounian, 1998) were identified for each plant taxa. The medicinal properties of the plants were determined based on local knowledge. Finally, a comprehensive list of wild plants in the area with related data provided. The conservation status of all plants in the area assessed using GeoCAT online software and data points from GBIF. GeoCAT is an open source, browser-based tool that performs rapid spatial analysis for Red List assessment. This analysis, especially referenced to use primary occurrence data, focuses on two aspects of a taxon's geographic range: extent of occurrence (EOO) and area of occupation (AOO). These criteria form part of the IUCN Red List categories and criteria, and achieving them in a precise, consistent and reproducible manner has often been challenging. In a familiar Google Maps environment, GeoCAT users can combine data from multiple sources such as GBIF as well as user-generated event data quickly and easily. The output of GeoCAT for EOO and AOO is in square kilometers, with the occupied area calculated using a default cell width of 2 km, equivalent to a 4 km square grid cell. The IUCN Red List guidelines recommend a cell width of 2 km. This tool enables users to conduct geographic analysis of species distribution (GeoCat, 2024).

Results

306 species of vascular plants belonging to 195 genera and 49 families have been identified, which belong to two species of Equisetophyta, one species of Coniferophyta, and 303 species of Magnoliophyta (49 species of monocots angiosperms, and 254 species of dicots angiosperms). Asteraceae, Poaceae, Fabaceae, Lamiaceae & Apiaceae, Brassicaceae, Caryophyllaceae, and Boraginaceae are the eight largest families with subsequently 51 (16.66%), 26 (8.5%), 25 (8.17%), 19 and 19 (6.2%), 18 (5.9%), 15 (4.8%), and 14 (4.6%) species respectively. *Astragalus* (13 species), *Euphorbia* (seven species), *Polygonum* (six species), and *Salvia* (six species) were the first four major genera respectively. It is necessary to mention that the most abundant genus in this region, i.e. *Astragalus*, is the largest genus in Iran and the world (Ghahremaninejad et al., 2022). Most species belong to the region of Irano-Turanians (66.7%), but due to the presence of a variety of climates, plants with other chorotypes such as Euro-Siberian, the Sindian Desert, the Mediterranean, etc. are also present in the region. Life forms of the determined species were detected therophytes 108 species (35.3%), hemicryptophytes 76 (24.83%), chamaephytes 52 (17%), geophytes 44 (14.38%), phanerophytes 19 (6.2%), hydrophytes with 5 (1.63%), and parasites with 2 species (0.65%). Due to different climatic conditions and different altitudes and the creation of micro and macro climates in the region, some species are seen with diverse nature. There are 60 endemic species (19.6%), 46 rare species (15.03%), and 116 species (37.9%) with medicinal values in the study area.

The results obtained using GeoCat online software for the conservation status of studied area's plants, showed that 191 (62.42%) species are threatened, that 24 (7.85%) plant species are classified as Critically Endangered (CR), 114 (37.25%) Endangered (EN), and 53 (17.32%) Vulnerable (VU). The number of plant species in other IUCN categories are 85 (27.78%) Near Threatened (NT), and 30 (9.8%) Data Deficient (DD). Botanical species names and their families, their voucher numbers, life forms, chorotypes, phenology status, IUCN status, endemic, rare, and mono-species taxa, medicinal uses, the altitude of vegetation place of each species, were determined and are shown in Table 1.

Table 1: Botanical names and their families, voucher numbers, life forms, chorotypes, phenology, IUCN status, medicinal uses, endemic, rare and monospecies plants, and the altitude of vegetation places of each plant species in the studied area.

Botanical Name and Family, (Voucher Number)	Life Form	Chorotype	Phenology	EOO/AOO	MU(+)/En, R, Mo ¹	Altitude
(Equisetophyta)						
Equisetaceae						
<i>Equisetum fluviatile</i> L. (T18527)	G	IT-ES	k	LC/NT		D-J
<i>Equisetum ramosissimum</i> Desf. (T18528)	G	IT-ES	k	LC/NT	+	E
(Coniferophyta)						
Cupressaceae						
<i>Juniperus excelsa</i> M.Bieb. (T18507)	Ph	IT	k	LC/VU	+	C-G
(Magnoliophyta)						
Amaranthaceae						
<i>Amaranthus chlorostachys</i> Willd. (T18530)	T	IT	k	DD/DD	+	E
<i>Amaranthus retroflexus</i> L. (T18531)	T	Co	k	LC/NT		H-J
<i>Chenopodium botrys</i> L. (T18532)	T	IT-ES	e	LC/VU	+	H-J
<i>Chenopodium foliosum</i> Asch. (T18533)	T	IT-ES	a	LC/NT		D-M
<i>Krascheninnikovia ceratoides</i> (L.) Gueldenst. (T18534)	C	IT-ES	e	DD/DD		M
<i>Noaea mucronata</i> (Forssk.) Asch. & Schweinf. (T18535)	C	IT	f	LC/NT		M
Amarylidaeae						
<i>Allium atroviolaceum</i> Boiss. (T18728)	G	IT	n	LC/EN	+	D-I
<i>Allium cathodicarpum</i> Wendelbo (T18730)	G	IT	n	CR/CR	En	E-K
<i>Allium lalesaricum</i> Freyn. (T18729)	G	IT	n	DD/DD	En-R	H-O
Anacardiaceae						
<i>Pistacia atlantica</i> Desf. (T18536)	Ph	IT	k	LC/VU	+	H-J
Apiaceae						
<i>Astrodaucus orientalis</i> (L.) Drude (T18537)	Hc	IT-ES	d	LC/VU		E
<i>Bunium cylindricum</i> (Boiss. & Hohen.) Drude (T18538)	G	IT	b	LC/EN	+En	A-B
<i>Bunium persicum</i> (Boiss.) B.Fedtsch. (T18541)	G	IT	j	LC/EN	+En	I
<i>Bupleurum exaltatum</i> M.Bieb. (T18539)	G	IT	k	DD/DD		K-M
<i>Carum carvi</i> L. (T18540)	Hc	IT	k	LC/NT	En	L
<i>Dorema aucheri</i> Boiss. (T18542)	Hc	IT	b	VU/EN	+En-R	J
<i>Ducrosia assadii</i> Alava (T18545)	Hc	IT-ES	k	DD/DD	En	C-E
<i>Eryngium billardieri</i> Delile. (T18543)	Hc	IT	k	CR/CR	+	H
<i>Eryngium bungei</i> Boiss. (T18544)	Hc	IT	k	LC/EN	+	G-J
<i>Ferulago angulata</i> (Schltdl.) Boiss. (T18500)	Hc	IT	k	LC/EN	+En	H-J
<i>Ferulago carduchorum</i> Boiss. & Hausskn. (T18602)	Hc	IT	j	DD/DD	+	I
<i>Levisticum officinale</i> W.D.J.Koch (T18501)	G	IT-ES	o	LC/NT	+Mo-En	J
<i>Physospermum cornubiense</i> (L.) DC. (T18502)	G	IT	k	LC/VU	+	E
<i>Prangos cheilanthisfolia</i> Boiss. (T18546)	Hc	IT	b	LC/EN	+En-R	B
<i>Rhabdosciadium petiolare</i> Boiss. & Hausskn. (T18547)	T	IT	d	CR/CR	En	F-J
<i>Scandix pecten-veneris</i> L. (T18548)	T	IT	b	LC/NT		D
<i>Semenovia suffruticosa</i> (Freyn & Bornm.) Manden. (T18551)	C	IT	n	LC/EN	En	M
<i>Semenovia tragioides</i> (Boiss.) Pimenov & V.N.Tikhom. (T18549)	T	IT	m	LC/EN		E
<i>Torilis leptophylla</i> (L.) Rchb.f. (T18550)	T	IT	b	LC/VU		C-E
Asteraceae						
<i>Achillea willhelmsii</i> K.Koch (T18552)	C	IT-ES	j	DD/DD	+	A-J
<i>Acroptilon repens</i> (L.) DC. (T18553)	G	IT-ES	e	LC/VU	Mo	A-J
<i>Aegopordon berardioides</i> Boiss. (T18554)	Hc	IT	m	LC/EN	Mo-En	A-J
<i>Anthemis odontostephana</i> Boiss. (T18555)	T	IT	b	LC/EN		D
<i>Arctium lappa</i> L. (T18556)	Hc	IT	d	LC/NT	+	E
<i>Artemisia aucheri</i> Boiss. (T18525)	C	IT	f	LC/EN	+En	M
<i>Artemisia persica</i> Boiss. (T18526)	C	IT	f	LC/VU	+	H-M
<i>Artemisia sieberi</i> Besser (T18557)	C	IT	f	LC/VU	+	A-B
<i>Carduus pycnocephalus</i> L. (T18558)	T	IT-ES	c	LC/NT		A
<i>Carthamus oxyacantha</i> M.Bieb. (T18559)	T	IT	n	DD/DD	+	A
<i>Centaurea iberica</i> Trevir. ex Spreng. (T18560)	Hc	IT-ES	g	LC/NT	+	A-B
<i>Centaurea virgata</i> Lam. (T18562)	Hc	IT	k	LC/VU		F-L
<i>Cichorium intybus</i> L. (T18564)	T	IT	e	LC/NT	+	C-G
<i>Cirsium congestum</i> Fisch. & C.A.Mey. ex DC. (T18567)	T	IT	n	NT/EN		H-O
<i>Cirsium rhizocephalum</i> C.A.Mey. (T18579)	Hc	IT	f	LC/EN		N
<i>Cirsium vulgare</i> (Savi) Ten. (T18601)	Hc	IT	o	LC/NT		B-C
<i>Conyza canadensis</i> (L.) Cronquist (T18566)	T	Co	n	LC/NT		H-L



<i>Cousinia calcitrapa</i> Boiss. (T18582)	Hc	IT	k	LC/EN	En	D-J
<i>Cousinia multiloba</i> DC. (T18568)	Hc	IT	n	LC/EN		O
<i>Cousinia quisarensis</i> Rech.f. (T18590)	Hc	IT	b	DD/DD		H-L
<i>Crepis pulchra</i> L. (T18569)	T	IT	n	LC/NT		D-O
<i>Crepis sancta</i> (L.) Bornm. (T18570)	T	IT	n	LC/NT	+	A-B
<i>Echinops ceratophorus</i> Boiss. (T18571)	Hc	IT	m	LC/EN	En-R	K
<i>Echinops lalesarensis</i> Bornm. (T18572)	Hc	IT-ES	m	VU/EN	En-R	K
<i>Erigeron acer</i> f. <i>acer</i> (T18573)	C	IT	f	LC/NT	En	H-N
<i>Filago hurdwarica</i> (Wall. ex DC.) Wagenitz (T18574)	T	IT	n	LC/EN		H-J
<i>Gnaphalium luteoalbum</i> L. (T18576)	T	IT	b	LC/VU		A-J
<i>Gundelia tournefortii</i> L. (T18577)	G	IT	j	LC/NT	+	A-D
<i>Hertia intermedia</i> (Boiss.) Kuntze (T18503)	C	IT	k	LC/EN	+	A-D
<i>Lactuca serriola</i> L. (T18563)	Hc	IT-ES	k	LC/NT		E
<i>Onopordum leptolepis</i> DC. (T18580)	T	IT	m	LC/EN	+	H-I
<i>Outreya carduiiformis</i> Jaub. & Spach (T18581)	T	IT	m	CR/CR	En-Mo	H-O
<i>Picris strigosa</i> M.Bieb. (T18583)	Hc	IT	f	LC/EN		H-N
<i>Pseudognaphalium luteoalbum</i> (L.) Hilliard & B.L.Burt (T18584)	T	IT	j	LC/NT		K
<i>Psychrogeton nigromontanus</i> (Boiss. & Buhse) Grierson (T18565)	T	IT	n	LC/EN		H-J
<i>Pulicaria gnaphalodes</i> (Vent.) Boiss. (T18585)	T	IT	j	LC/EN	+	K
<i>Scariola orientalis</i> (Boiss.) Sojak (T18586)	C	IT	n	LC/EN	+	H-K
<i>Scorzonera intricata</i> Boiss. (T18587)	Hc	IT	m	VU/EN	+/En	C-D
<i>Scorzonera raddeana</i> C.Winkl. (T18591)	G	IT	b	LC/EN		A-B
<i>Senecio glaucus</i> L. (T18592)	T	IT-ES-SS-M	a	LC/VU	+/En	H-N
<i>Sonchus asper</i> (L.) Hill (T18593)	T	IT-ES-SS	e	LC/NT	+	E
<i>Sonchus maritimus</i> L. (T18594)	T	IT-ES	k	LC/VU		F
<i>Sonchus tenerrimus</i> L. (T18595)	T	IT-ES	d	LC/NT		E
<i>Tanacetum parthenium</i> (L.) Sch.Bip. (T18504)	C	Co	e	LC/NT	+	H-J
<i>Taraxacum montanum</i> (C.A.Mey.) DC. (T18596)	G	IT	d	CR/CR		E-J
<i>Taraxacum pseudocalocephalum</i> Soest (T18597)	G	IT	a	LC/EN		E-J
<i>Taraxacum syriacum</i> Boiss. (T18598)	G	IT	a	LC/EN	+	C-E
<i>Tragopogon caricifolius</i> Boiss. (T18599)	Hc	IT	b	LC/EN	En-R	A-D
<i>Tragopogon graminifolius</i> DC. (T18600)	Hc	IT-ES	n	LC/EN		A-E
<i>Tripleurospermum disciforme</i> (C.A.Mey.) Sch.Bip. (T18806)	C	IT	n	LC/EN		M
<i>Varthemia persica</i> DC. (T18505)	C	IT	n	LC/EN	+/En	H-K
Berberidaceae						
<i>Berberis integerrima</i> Bunge (T18506)	Ph	IT	b	LC/VU	+	A-K
Boraginaceae						
<i>Anchusa ovata</i> Lehm. (T18603)	T	IT	n	LC/VU		H-M
<i>Arnebia euchroma</i> (Royle) I.M.Johnst. (T18604)	Hc	IT	n	LC/VU		G-J
<i>Asperugo procumbens</i> L. (T18605)	T	IT-ES	b	LC/NT	Mo	H-K
<i>Lappula microcarpa</i> (Ledeb.) Gurke (T18606)	Hc	IT-SS	k	LC/EN		D-K
<i>Lithospermum officinale</i> L. (T18607)	G	IT-ES	c	LC/NT	+	C
<i>Myosotis refracta</i> Boiss. (T18608)	T	IT	m	LC/EN		L
<i>Nonnea caspica</i> G.Don (T18609)	T	IT-ES	j	CR/CR	+	M
<i>Nonnea persica</i> Boiss. (T18610)	Hc	IT	j	DD/DD	+	A-M
<i>Onosma stenosphon</i> Boiss. (T18611)	Hc	IT	j	VU/EN	+/En-R	D-K
<i>Paracaryum persicum</i> Boiss. (T18612)	Hc	IT	b	NT/EN	En	D-K
<i>Paracaryum rugulosum</i> (DC.) Boiss. (T18613)	Hc	IT	b	LC/EN		C-K
<i>Rochelia disperma</i> (L.f.) K.Koch (T18614)	T	IT	k	LC/VU		N
<i>Rochelia peduncularis</i> Boiss. (T18615)	T	IT	b	LC/EN		D-E
<i>Rochelia persica</i> Bunge ex Boiss. (T18616)	T	IT	b	LC/EN		D-E
Brassicaceae						
<i>Alyssum iranicum</i> Haussk. ex Baumg. (T18618)	Hc	IT	b	LC/EN	En	C
<i>Alyssum linifolium</i> Stephan ex Willd. (T18619)	T	IT-ES	b	LC/VU		D-E
<i>Alyssum marginatum</i> Steud. ex Boiss. (T18620)	T	IT	b	DD/DD		D-F
<i>Alyssum scovitsianum</i> Fisch. & C.A.Mey. (T18621)	T	IT-ES	b	DD/DD	+	B-C
<i>Barbarea plantaginea</i> DC. (T18622)	T	IT-ES	b	LC/EN		D-E
<i>Camelina rumelica</i> Velen. (T18624)	T	IT	b	LC/VU		C-F
<i>Capsella bursa-pastoris</i> (L.) Medk. (T18625)	T	IT	j	LC/NT	+	D-E
<i>Cardaria draba</i> (L.) Desv. (T18626)	T	IT-ES	j	LC/VU	Mo	D-E
<i>Choriospora persica</i> Boiss. (T18627)	T	IT	b	DD/DD	En	D-E
<i>Choriospora tenella</i> (Pall.) DC. (T18628)	T	IT-ES	b	DD/DD		D-E
<i>Cithareloma lehmanii</i> Bunge (T18629)	T	IT	b	DD/DD		C-F
<i>Conringia orientalis</i> (L.) C.Presl (T18630)	T	IT-ES	b	LC/VU		C-F
<i>Descurainia sophia</i> (L.) Webb ex Parntl (T18631)	T	IT-ES	b	LC/NT	+	A-F

<i>Erysimum repandum</i> L. (T18634)	T	IT-ES	b	LC/NT		D-E
<i>Euclidium syriacum</i> (L.) R.Br. (T18635)	T	IT	b	LC/NT		D-E
<i>Graellsia saxifragifolia</i> (DC.) Boiss. (T18636)	C	IT	k	LC/EN		E-F
<i>Hirschfeldia incana</i> (L.) Lagr.-Foss (T18623)	T	IT	b	LC/NT		L
<i>Neslia apiculata</i> Fisch., C.A.Mey. & Ave-Lall. (T18617)	C	IT	g	LC/VU		B-E
Campanulaceae						
<i>Campanula kermanica</i> (Rech.f., Aellen & Esfand.) Rech.f. (T18638)	C	IT	j	VU/EN	+/En-R	D-K
Caprifoliaceae						
<i>Lonicera nummulariifolia</i> Jaub. & Spach (T18639)	Ph	IT	e	LC/EN		E-F
<i>Pterocephalus afghanicus</i> Boiss. (T18640)	C	IT	b	CR/CR		D-E
<i>Valerianella pumila</i> (L.) DC. (T18641)	T	IT	b	LC/VU		C-E
Caryophyllaceae						
<i>Acanthophyllum glandulosum</i> Bunge ex Boiss. (T18642)	C	IT	e	LC/EN		E-N
<i>Acanthophyllum sordidum</i> Bunge ex Boiss. (T18643)	C	IT	e	LC/EN	En-R	D-N
<i>Buffonia mauritanica</i> Murbeck (T18644)	T	IT	e	DD/DD		H-K
<i>Cerastium inflatum</i> Link ex Desf. (T18645)	T	IT	b	LC/EN		C-E
<i>Dianthus crinitus</i> Sm. (T18646)	C	IT	k	LC/VU	+/En	E-F
<i>Holosteum glutinosum</i> (M.Bieb.) Fisch. & C.A.Mey. (T18648)	T	IT	b	LC/VU		M-N
<i>Lepyrodiclis holosteoides</i> (C.A.Mey.) Fenzl ex Fisch. & C.A.Mey. (T18649)	T	IT	k	LC/VU		C-K
<i>Minuartia meyeri</i> (Boiss.) Bornm. (T18650)	T	IT	k	LC/EN		M-N
<i>Silene conoidea</i> L. (T18651)	T	Co	b	LC/NT	+	A-I
<i>Silene dschuparensis</i> Bornm. (T18652)	C	IT	j	EN/EN	En	E-N
<i>Silene spergulifolia</i> (Willd.) M.Bieb. (T18653)	C	IT-ES	j	LC/EN	+	C-G
<i>Silene stapfii</i> Melzh. (T18654)	C	IT	k	CR/CR	En-R	E-O
<i>Silene viscosa</i> (L.) Pers. (T18647)	C	IT	k	LC/NT		F-I
<i>Spergularia diandra</i> (Guss.) Heldr. (T18655)	T	IT-ES	j	LC/NT		M-N
<i>Vaccaria oxyodonta</i> Boiss. (T18656)	T	IT	b	LC/EN		K
Colchicaceae						
<i>Colchicum kotschyi</i> Boiss. (T18731)	G	IT	b	LC/EN		A-C
<i>Colchicum schimperi</i> Janka ex Stef. (T18732)	G	IT-M	f	LC/EN		A-K
Convolvulaceae						
<i>Convolvulus leiocalycinus</i> Boiss. (T18659)	C	IT	k	LC/EN	+	D-L
<i>Cuscuta monogyna</i> Vahl (T18661)	Pa	IT	o	LC/VU		A-K
Cucurbitaceae						
<i>Bryonia aspera</i> Steven ex Ledeb. (T18660)	G	IT	o	LC/EN		H-M
Cyperaceae						
<i>Carex divisa</i> Huds. (T18662)	Hc	IT-ES	k	LC/VU		H-K
<i>Carex hirta</i> L. (T18663)	G	IT	k	LC/NT		E-N
<i>Carx secalina</i> Willd. ex Wahlenb. (T18664)	Hc	IT-ES	k	DD/DD		C-N
<i>Carex stenophylla</i> Wahlenb. (T18665)	G	IT-ES	b	LC/NT		B
<i>Isolepis setacea</i> (L.) R.Br. (T18666)	Hc	Co	k	LC/VU		E-F
<i>Schoenus nigricans</i> L. (T18667)	Hc	IT-ES	b	LC/VU		F
Datisaceae						
<i>Datisca cannabina</i> L. (T18508)	Hc	IT	e	LC/VU	+	E
Euphorbiaceae						
<i>Euphorbia gedrosiaca</i> Rech.f., Aellen & Esfand (T18509)	Hc	IT	k	LC/EN	+/En-R	D-J
<i>Euphorbia hebecarpa</i> Boiss. (T18670)	Hc	IT	n	LC/EN	+/En	D-M
<i>Euphorbia helioscopia</i> L. (T18671)	T	IT-ES-M	b	LC/NT	+	C-F
<i>Euphorbia heteradena</i> Jaub. & Spach (T18672)	Hc	IT	j	LC/EN	+	A-I
<i>Euphorbia microsciadia</i> Boiss. (T18673)	Hc	IT	g	LC/EN		B-C
<i>Euphorbia szovitsii</i> Fisch. & C.A.Mey. (T18674)	T	IT	j	LC/EN		K
<i>Euphorbia turcomanica</i> Boiss. (T18675)	T	IT	g	LC/EN		A-C
Fabaceae						
<i>Astragalus baftensis</i> Ranjbar & Maassoumi (T18676)	C	IT	m	DD/DD	+/En-R	D-E
<i>Astragalus campylorrhynchus</i> Fisch. & C.A.Mey. (T18677)	T	IT	m	LC/EN		K
<i>Astragalus carmanicus</i> Bornm. (T18520)	C	IT	m	CR/CR	+/En	C-F
<i>Astragalus cephalanthus</i> DC. (T18679)	C	IT	m	LC/EN	+/En-R	H-K
<i>Astragalus commixtus</i> Bunge (T18681)	T	IT	j	LC/EN		G-H
<i>Astragalus dactylocarpus</i> Boiss. (T18521)	C	IT-ES	m	LC/EN	+	D-E
<i>Astragalus hezarensis</i> Zarre & Podlech (T18680)	C	IT	m	CR/CR	En-R	H-O
<i>Astragalus lalesarensis</i> Bornm. (T18682)	C	IT	m	LC/EN	En-R	H-O
<i>Astragalus microcephalus</i> Willd. (T18683)	C	IT	j	LC/EN	R	D-E
<i>Astragalus myriacanthus</i> Boiss. (T18684)	C	IT	m	LC/EN	+/En-R	D-O
<i>Astragalus rhodosemius</i> Boiss. & Hausskn. (T18523)	C	IT	m	NT/EN	+/En	M-N



<i>Astragalus siliquosus</i> Boiss. (T18524)	C	IT	j	LC/EN	+	D-E
<i>Astragalus spachianus</i> Boiss. (T18686)	C	IT	j	DD/DD	En	D-E
<i>Colutea gracilis</i> Freyn & Sint. (T18685)	Ph	IT	b	VU/EN	+R	D-K
<i>Glycyrrhiza glabra</i> L. (T18687)	Hc	IT-ES	n	LC/NT	+R	A-K
<i>Medicago lupulina</i> L. (T18688)	T	IT	k	LC/NT		A-K
<i>Medicago sativa</i> L. (T18689)	Hc	IT-ES	k	LC/NT	+	A-K
<i>Melilotus officinalis</i> (L.) Pall. (T18690)	Hc	IT-ES	k	LC/NT	+	A-K
<i>Onobrychis altissima</i> Grossh. (T18691)	Hc	IT	j	LC/EN		C-F
<i>Onobrychis cornuta</i> (L.) Desv. (T18692)	C	IT	k	LC/VU	R	M-N
<i>Onobrychis kermanensis</i> (Sirj. & Rech.f.) Rech.f. (T18693)	Hc	IT	k	CR/CR	En-R	H-K
<i>Oxytropis hirsutiuscula</i> Freyn (T18694)	Hc	IT	e	LC/EN		M-N
<i>Trifolium pratense</i> L. (T18696)	G	IT-ES	m	LC/NT		A-K
<i>Trifolium repens</i> L. (T18697)	G	IT-ES-SS	m	LC/NT		A-E
<i>Vicia monthana</i> Retz. (T18699)	T	IT-ES	b	DD/DD		A-G
Geraniaceae						
<i>Erodium cicutarium</i> (L.) L'Hér. (T18701)	G	IT-ES	a	LC/NT	+	C-F
<i>Geranium collinum</i> Stephan ex Wild (T18668)	G	IT	a	LC/NT		C-F
<i>Geranium stepporum</i> L. (T18702)	G	IT	b	CR/CR		C-F
IXIOLIRIACEAE						
<i>Ixiolirion tataricum</i> (Pall.) Schult. & Schult.f. (T18705)	G	IT	a	LC/NT		A-E
Juncaceae						
<i>Juncus gerardii</i> Loisel. (T18706)	Hc	IT	g	DD/DD		C-D
<i>Juncus heldreichianus</i> T.Marsson ex Parl. (T18707)	Hc	IT	e	LC/VU		D-M
<i>Juncus inflexus</i> L. (T18708)	Hc	IT-ES	e	LC/NT		E-F
<i>Juncus interior</i> Wiegand (T18709)	Hc	IT	e	LC/NT		M-N
Lamiaceae						
<i>Ajuga chamaecistus</i> Ging. ex Benth. (T18710)	C	IT	b	LC/EN	+En-R	A-C
<i>Lamium amplexicaule</i> L. (T18712)	T	IT-ES-SS	k	LC/NT	+	C-K
<i>Marrubium crassidens</i> Boiss. (T18713)	Hc	IT	k	LC/EN	+	D-E
<i>Marrubium vulgare</i> L. (T18714)	Hc	IT-ES	k	LC/NT	+	A-M
<i>Mentha longifolia</i> (L.) L. (T18510)	G	IT-ES-SS	o	LC/NT	+En	A-L
<i>Nepeta assurgens</i> Hausskn. & Bornm. (T18715)	Hc	IT	o	CR/EN	En	D-M
<i>Nepeta bornmuelleri</i> Hausskn. ex Bornm. (T18720)	Hc	IT	j	CR/CR	+En	E-F
<i>Nepeta rivularis</i> Bornm. (T18511)	Hc	IT	k	CR/CR	+En	D-N
<i>Salvia macrosiphon</i> Boiss. (T18721)	Hc	IT-SS	j	LC/EN	+En	D-K
<i>Salvia nemorosa</i> L. (T18722)	Hc	IT-ES	m	LC/NT	+	H-M
<i>Salvia rhytidea</i> Benth. (T18512)	Hc	IT	n	LC/EN	+En	E-N
<i>Salvia sclarea</i> L. (T18723)	Hc	IT	n	LC/NT	+	H-K
<i>Salvia virgata</i> Jacq. (T18717)	Hc	IT	e	LC/VU		H-K
<i>Scutellaria multicaulis</i> Boiss. (T18513)	C	IT	n	LC/EN	+En	D-O
<i>Sideritis comosa</i> (Rochel ex Benth.) Stankov (T18724)	T	IT	j	LC/EN		E
<i>Sideritis montana</i> L. (T18725)	T	IT-ES	j	LC/NT		C-F
<i>Stachys acerosa</i> Boiss. (T18514)	C	IT	n	LC/EN	+En-R	C-O
<i>Stachys setifera</i> C.A.Mey. (T18726)	G	IT	n	LC/EN	+En	B-D
<i>Thymus carmanicus</i> Jalas (T18515)	Hc	IT	e	CR/CR	+En-R	H-O
Liliaceae						
<i>Eremurus persicus</i> (Jaub. & Spach) Boiss. (T18733)	G	IT	g	LC/EN	+	C-E
<i>Gagea capillifolia</i> Vved. (T18734)	G	IT	b	LC/EN	R	B-C
<i>Gagea gageoides</i> (Zucc.) Vved. (T18735)	G	IT	b	LC/VU		B-M
<i>Gagea stipitata</i> Merckl. ex Bunge (T18736)	G	IT	b	LC/EN		B-C
<i>Tulipa biflora</i> Pall. (T18738)	G	IT-M	b	LC/VU		A-D
Linaceae						
<i>Linum album</i> Kotschy ex Boiss. (T18739)	G	IT	j	LC/EN	+En-R	C-E
Malvaceae						
<i>Malva neglecta</i> Wallr. (T18741)	Hc	IT-ES-SS	l	LC/NT	+	A-M
<i>Malva sylvestris</i> L. (T18742)	Hc	IT-ES	l	LC/NT	+	A-C
Moraceae						
<i>Ficus johannis</i> Boiss. (T18743)	Ph	IT	b	LC/EN	R	L
Nitrariaceae						
<i>Peganum harmala</i> L. (T18657)	Hc	IT-ES-SS	o	LC/NT	+En	A-I
Onagraceae						
<i>Epilobium hirsutum</i> L. (T18744)	G	IT-ES	k	LC/NT	+	H-M

<i>Epilobium minutiflorum</i> Hausskn. (T18745)	G	IT-ES	o	LC/VU		H-K
Orchidaceae						
<i>Dactylorhiza umbrosa</i> (Kar. & Kir) Nevski (T18746)	G	IT	m	LC/EN	R	K
Orobanchaceae						
<i>Orobancha cernua</i> Loebl. (T18747)	Pa	IT	n	LC/NT		E-F
<i>Pedicularis lalesarensis</i> Bornm. (T18748)	Hc	IT	e	CR/CR	R	N
Papaveraceae						
<i>Fumaria parviflora</i> Lam. (T18700)	T	IT-ES-SS	c	LC/NT	+	C-E
<i>Glaucium vitellinum</i> Boiss. & Buhse (T18749)	T	IT-ES	c	CR/CR	+	H-K
<i>Glaucium grandiflorum</i> Boiss. & A.Huet (T18516)	T	IT-ES	j	LC/EN	+	C-E
<i>Hypecium pendulum</i> L. (T18750)	T	IT-ES-SS	b	LC/VU		D-E
<i>Papaver decaisnei</i> Hochst & Steud. ex Elkan (T18751)	T	IT	j	LC/EN	+	D-E
<i>Papaver dubium</i> L. (T18752)	T	IT	j	LC/NT		D-K
Plantaginaceae						
<i>Linaria remotifolia</i> Patzak (T18561)	T	IT	k	DD/DD		D-O
<i>Plantago gentianoides</i> Sm. (T18753)	T	IT	n	LC/EN		C-M
<i>Plantago lanceolata</i> L. (T18754)	T	IT-ES	n	LC/NT	+	A-G
<i>Veronica anagalis-aquatica</i> L. (T18756)	Hyd	IT-ES	k	DD/DD	+	D-N
<i>Veronica beccabunga</i> L. (T18757)	Hyd	IT-ES	k	LC/NT		D-E
Plumbaginaceae						
<i>Acantholimon cupreo-olivascens</i> Rech.f. & Schiman-Czeika (T18760)	C	IT	k	CR/CR		H-O
<i>Acantholimon haesarensis</i> Bornm. ex Rech.f. & Schiman-Czeika (T18758)	C	IT	k	CR/CR	En	J-O
<i>Acantholimon kermanense</i> Assadi & Mirtadz. (T18761)	C	IT	k	DD/DD		N
<i>Acantholimon modestum</i> Bornm. ex Rech.f. & Schiman-Czeika (T18759)	C	IT	k	CR/CR	En	K-N
Poaceae						
<i>Agrostis stolonifera</i> L. (T18762)	T	IT	k	LC/NT	R	C-F
<i>Apera intermedia</i> (Hack.) Hack. (T18763)	T	IT	m	LC/EN		H-M
<i>Asthenatherum forskalii</i> (Vahl) Nevski (T18764)	T	IT-SS	m	DD/DD	R-Mo	K
<i>Avena fatua</i> L. (T18765)	T	Co	c	LC/NT		A-G
<i>Boissiera squarrosa</i> (Sol.) Nevski (T18766)	T	IT-M	c	LC/EN	+/Mo	D-E
<i>Bromus danthoniae</i> Trin. (T18767)	T	Co	c	LC/VU		H-I
<i>Bromus rubens</i> L. (T18768)	T	IT	m	LC/NT	R	K
<i>Bromus tectorum</i> L. (T18769)	T	Co	c	LC/NT		C-F
<i>Calamagrostis pseudophragmites</i> (Haller f.) Koeler (T18771)	Hc	IT-ES-M	n	LC/VU	+	E-K
<i>Chloris barbata</i> Sw. (T18772)	T	IT	n	LC/NT		D-M
<i>Cutandia maritima</i> (L.) Benth. (T18773)	T	IT-M	m	LC/VU		E-F
<i>Cutandia memphitica</i> (Spreng.) Benth. (T18774)	T	IT	m	LC/VU		H-M
<i>Cutandia stenostachya</i> Boiss. (T18775)	T	IT	j	LC/EN		D-E
<i>Heteranthelium piliferum</i> (Sol.) Hochst. ex Jaub. & Spach (T18776)	Hc	IT	j	LC/EN	Mo	H-K
<i>Hordeum glaucum</i> Steud. (T18777)	T	IT	m	LC/NT		H-K
<i>Lolium perenne</i> L. (T18778)	T	Co	j	LC/NT		A-H
<i>Melica jacquemontii</i> Decne. (T18779)	G	IT	m	LC/EN		H-K
<i>Melica persica</i> Kunth (T18780)	G	IT	m	LC/VU		H-K
<i>Nardurus maritimus</i> (L.) Murb. (T18781)	T	IT	n	LC/VU		H-N
<i>Oryzopsis barbellata</i> (Mez) Bor (T18782)	G	IT	b	CR/CR	En-R	B-C
<i>Poa sinaica</i> Steud. (T18783)	G	IT-SS	n	LC/EN		H-K
<i>Polypogon fugax</i> Nees ex Steud. (T18784)	T	IT-SS	j	LC/NT		D-N
<i>Polypogon maritimus</i> Willd. (T18785)	T	IT-M	j	LC/VU		H-J
<i>Schimus barbatus</i> (L.) Thell. (T18786)	T	IT	j	DD/DD		H-M
<i>Stipa arabica</i> Trin. & Rupr. (T18787)	Hc	IT-ES	j	LC/VU		E-F
<i>Stipa parviflora</i> Desf. (T18788)	Hc	IT-ES-SS	j	LC/VU		H-J
Polygonaceae						
<i>Polygonum aviculare</i> L. (T18789)	T	Co	n	LC/NT	+	A-G
<i>Polygonum convolvulus</i> L. (T18790)	T	IT-ES-SS	n	LC/VU		E
<i>Polygonum molliiforme</i> Boiss. (T18791)	T	IT	n	LC/EN		H-K
<i>Polygonum paronychioides</i> C.A.Mey. (T18792)	C	IT	j	LC/VU	+	D-N
<i>Polygonum salicornioides</i> Jaub. & Spach ex Boiss. (T18793)	C	IT	b	CR/CR	En	H-I
<i>Polygonum spinosum</i> H.Gross (T18794)	C	IT	j	VU/EN	En-R	C-O
<i>Rumex chalepensis</i> Mill. (T18796)	Hc	IT	j	LC/EN	+	M-N



<i>Rumex crispus</i> L. (T18797)	Hc	IT	e	LC/NT	+	C-G
Potamogetonaceae						
<i>Zannichellia palustris</i> L. (T18637)	Hyd	IT	e	LC/NT		N
Primulaceae						
<i>Primula capitellata</i> Boiss. (T18798)	Hc	IT	n	LC/EN	+/R	H-K
Ranunculaceae						
<i>Adonis aestivalis</i> L. (T18770)	T	IT-ES	b	LC/NT	+	C-F
<i>Batrachium spherospermum</i> (Boiss. & C.I.Blanche) Iranshahr (T18795)	Hyd	IT-ES	e	DD/DD		N
<i>Batrachium trichophyllum</i> (Chaix) Bosch (T18755)	Hyd	IT-ES	e	LC/NT		E
<i>Clematis ispanica</i> Boiss. (T18704)	Ph	IT	o	LC/EN	+	H-K
<i>Ranunculus arvensis</i> L. (T18703)	T	IT-ES-SS	b	LC/NT	+	C-F
<i>Ranunculus eriorrhizus</i> Boiss. & Buhse (T18740)	G	IT	n	NT/EN	En	H-N
<i>Ranunculus papyrocarpus</i> Rech.f., Aellen & Esfand. (T18737)	T	IT	n	EN/EN		H-N
<i>Thalictrum minus</i> L. (T18669)	Hc	IT-ES	j	LC/NT	+/R	H-L
Rhamnaceae						
<i>Rhamnus persica</i> P.Lawson (T18518)	Ph	IT	b	LC/EN	+/En	D-K
<i>Sageretia thea</i> (Osbeck.) M.C.Johnst. (T18658)	Ph	IT	b	LC/VU	+	C
Rosaceae						
<i>Cotoneaster kotschy</i> (C.K.Schneid.) G.Klotz (T18799)	Ph	IT	b	CR/CR	+/En	C-K
<i>Cotoneaster nummularius</i> Fisch. & C.A.Mey. (T18800)	Ph	IT	b	LC/VU	+	D-K
<i>Prunus eburnea</i> Aitch. (T18801)	Ph	IT	b	DD/DD	+/En-R	D-K
<i>Prunus elaeagnifolia</i> (Spach) A.E.Murray (T18802)	Ph	IT	b	LC/EN	+/En-R	K
<i>Prunus scoparia</i> Spach (T18803)	Ph	IT-SS	b	LC/EN	+/En	D-K
<i>Rosa beggeriana</i> Schrenk ex Fisch. & C.A.Mey. (T18804)	Ph	IT	n	LC/VU	+/En	K-N
<i>Rubus sanctus</i> Schreb. (T18805)	C	IT-ES	k	LC/NT		F-G
<i>Sanguisorba minor</i> Scop. (T18517)	Hc	IT-ES-M	k	LC/NT	+	A-M
Rubiaceae						
<i>Asperula glomerata</i> (M.Bieb.) Grisb. (T18727)	C	IT	n	LC/EN		D-N
<i>Callipeltis cucullaria</i> (L.) DC. (T18719)	T	IT-ES	b	LC/EN		D-K
<i>Galium aparine</i> L. (T18718)	T	IT	b	LC/NT		A-C
<i>Galium humifusum</i> M.Bieb. (T18716)	T	IT	b	LC/NT		C-F
<i>Galium spurium</i> L. (T18711)	T	IT	b	LC/NT		D-M
Salicaceae						
<i>Salix pycnostachya</i> Andersson (T18578)	Ph	IT	n	LC/EN	+	A-K
Sapindaceae						
<i>Acer monspessulanum</i> L. (T18529)	Ph	IT	b	LC/NT	En-R	B-D
Scrophulariaceae						
<i>Scrophularia kermanica</i> Ghahr. & Mirtadz. (T18588)	C	IT	k	DD/DD	R	D-O
<i>Scrophularia striata</i> Boiss. (T18589)	C	IT	k	LC/EN	+	F-M
<i>Verbascum songaricum</i> Schrenk (T18695)	Hc	IT-ES	k	LC/EN	+	A-L
Solanaceae						
<i>Hyoscyamus reticulatus</i> L. (T18698)	Hc	IT-ES	k	LC/EN		M-N
<i>Hyoscyamus senecionis</i> Willd. (T18678)	G	IT	k	LC/EN	+	A-L
Thymelaeaceae						
<i>Daphne mucronata</i> Royle (T18522)	Ph	IT	n	DD/DD	+	C-G
<i>Daphne oleoides</i> Schreb. (T18519)	Ph	IT	n	LC/VU	+/En	A-F
Urticaceae						
<i>Parietaria judaica</i> L. (T18632)	C	IT-ES-SS	n	LC/NT		K
<i>Urtica urens</i> L. (T18633)	T	IT	n	LC/NT	+/En	K

Life Form (C: Chamaephyte, G: Geophyte, Hc: Hemicryptophyte, Hyd: Hydrophyte, Pa: Parasite, Ph: Phanerophyte, T: Therophyte), Chorotype (Co: Cosmopolitan, ES: European-Siberian Region, IT: Irano-Turanian Region, M: Mediterranean Region, SS: Saharo-Sindian Region), Phenology (a: Early to mid-spring, b: Early to late spring, c: Mid to late spring, d: Early to mid-summer, e: Early to late summer, f: Mid to late summer, g: Early spring to early summer, h: Early spring to mid-summer, i: Early spring to late summer, j: Mid spring to early summer, k: Mid spring to mid-summer, l: Mid spring to late summer, m: Late spring to early summer, n: Late spring to mid-summer, o: Late spring to late summer), IUCN Status (CR: Critically Endangered, DD: Data Deficient, EN: Endangered, LC: Least Concern, NT: Near Threatened, VU: Vulnerable), 1-MU: Medicinal Use (+) / Endemic (En), Rare (R) and Monospecies (Mo) plants, Altitude (m asl) (A: 2300-2400, B: 2400-2500, C: 2500-2600, D: 2600-2700, E: 2700-2800, F: 2800-2900, G: 2900-3000, H: 3000-3100, I: 3100-3200, J: 3200-3300, K: 3300-3400, L: 3400-3500, M: 3500-3600, N: 3600-3700, O: 3700-3800).

Some of the region's edible plants include walnut, almond, peach, apricot, plum, cherry, apple, pear, wheat, barley, lentil, pea, bean, mung, garlic, onion, tomato, potato, squash, eggplant, cucumber, etc. The phenology of most of the plant species was in early to late spring (b), mid-spring to mid-summer (k) and late spring to mid-summer (n). The number of each life form, chorotypes, the first eight phenology times, and the first ten plant families with most species is shown in Figures 3, 4, 5, and 6 respectively. Some photos of the

studied area and some of the plants in them are shown in Figure 7.

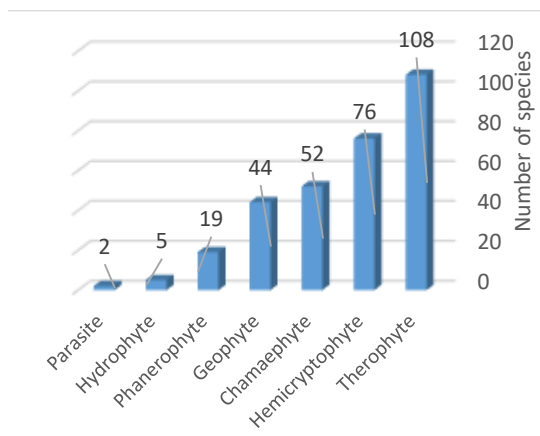


Figure 3: Number of life form in the Takhte-Sartashtak, Kerman province

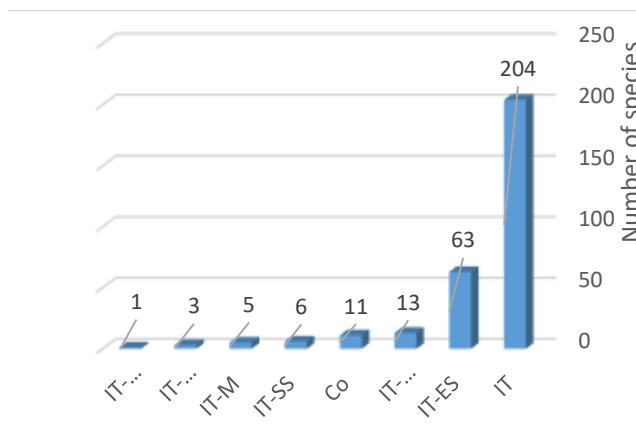


Figure 4: Number of chorotypes in the study area, Takhte-Sartashtak, Kerman province

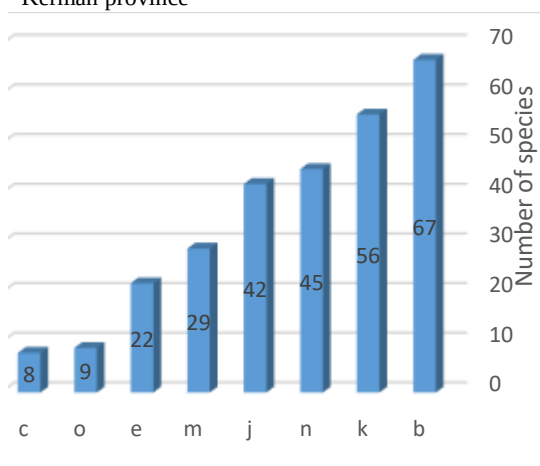


Figure 5: Phenology of plant in the Takhte-Sartashtak

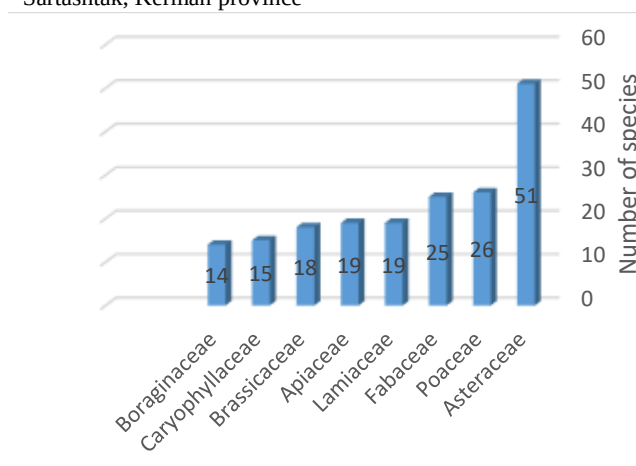


Figure 6: List of rich families in the Takhte-Sartashtak, Kerman province



a

b

c



d

e

f



<http://dx.doi.org/10.22108/TBJ.2024.141181.1256>



g



h



i



j



k



l



m



n



o



p



q



r

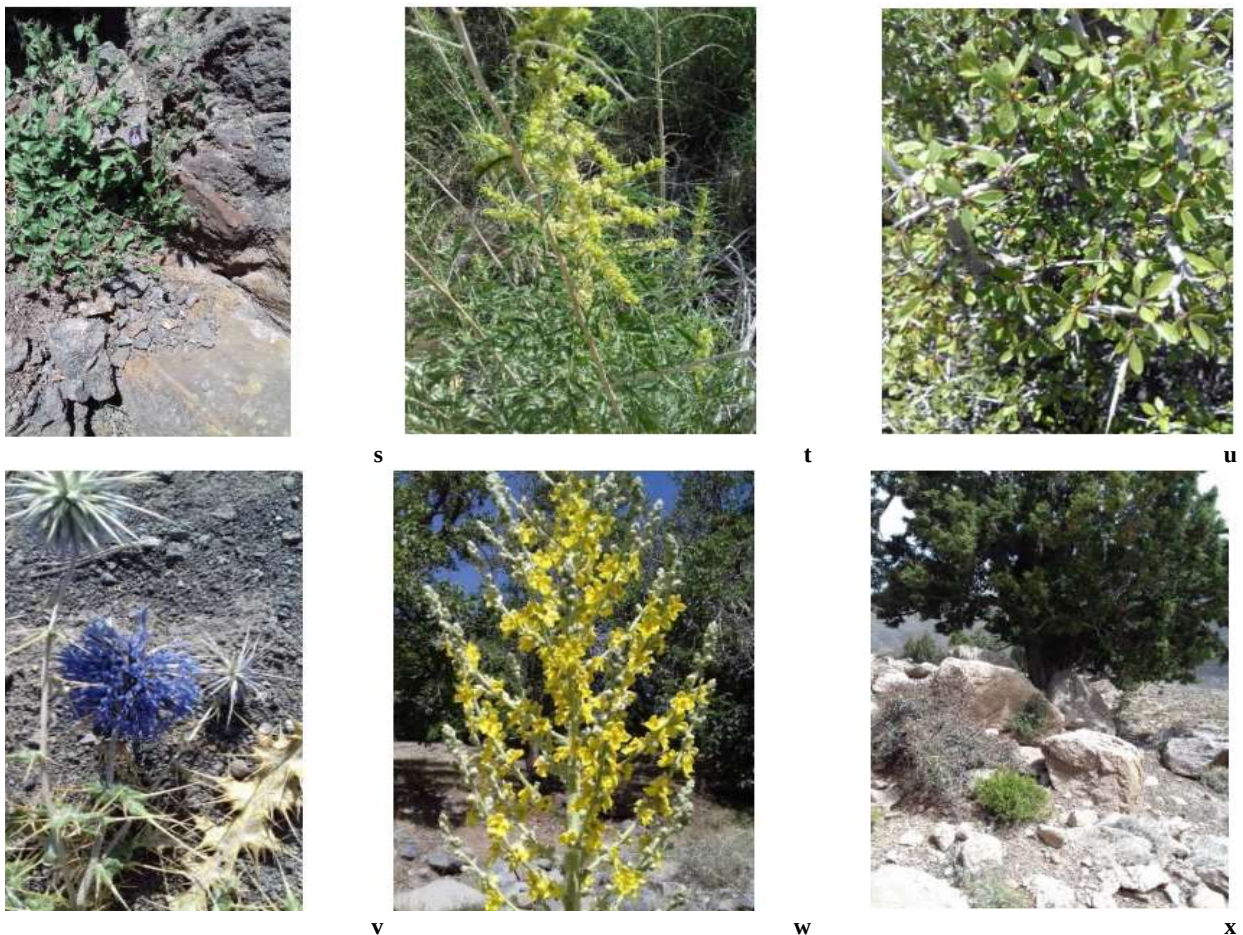


Figure 7 : Photos of the studied area (a-i), photos of some mosses in the area (j-l), photos of some lichens in the area (m-o), *Thymus carmanicus* (p), *Epilobium hirsutum* (q), *Glaucium grandiflorum* (r), *Campanula kermanica* (s), *Datisca cannabina* (t), *Rhamnus persica* (u), *Echinops lalesarensis* (v), *Verbascum songaricum* (w), and *Juniperus excelsa* (x).

Discussion

There are several ways to protect biodiversity as well as balance natural ecosystems. One of the most important and main methods is to prepare a list of plant species and determine their conservation status (Hamilton, 2004). It has been found that more than 10% of all plant species are somehow used in medicines and natural products (Huang, 2011; Rafieian Koopai, 2013). In addition to the above, some plant species due to their native or rarity are at risk (Figueriedo & Grelle, 2009).

The region covers about 0.024% of Iran's area. About 29.4% of families, 17.4% of genera, and 3.8% of Iranian plant species are found in the study area. The dominant families and genera of the Takhte-Sartashtak region are similar to the flora of the Iranian plateau (based on Rechinger, 1963-2015; Assadi, 1989-2023).

The findings have shown that some plant species are endangered and threatened, including the reasons for the threat of plants can be named as follows, overgrazing of livestock, over-harvesting for medicinal uses of plants, their use as a form of fuel, destruction of various habitats for the development of agricultural lands (Ghahremaninejad et al., 2021a), and the creation of tourist attractions, destruction of ecosystems for extraction of minerals and so on. Some of these taxa are more important for conservation because of overharvesting including *Achillea willhelmsii*, *Artemisia persica*, *Berberis integerrima*, *Bunium persicum*, *Cichorium intybus*, *Dianthus crinitus*, *Glycyrrhiza glabra*, *Gundelia tournefortii*, *Levisticum officinale*, *Pistacia atlantica*, *Prunus scoparia*, *Rosa begeriana*, *Sanguisorba minor*, and *Thymus carmanicus*.

Due to the importance of floristic work and to achieve this goal, a lot of research has been done in the field of vegetation in different regions of Iran and Kerman province. The high life forms of therophyte and hemicyptophyte were indicated severe environmental conditions, especially drought so that the living part of the plants in the unfavorable season is either under the soil or in the form of seeds and a state of sleep. The lack of phanerophytes is indicative of harsh conditions, in addition to drought, heavy snowfall in winter, as well as severe and dry winds, make it difficult to grow trees. Most species are from the Irano-Turanian region this ratio indicates the dominance of the conditions of this region. Other species, often of European-Siberian chorotype, show scattered wet microclimates.

Takhte-Sartashtak area and neighboring areas have rural tourist attractions. Attracting tourists to the villages helps to develop them and can provide good opportunities for the villagers to create jobs and income. Obviously, tourism, in addition to all the positive aspects that it can have, also has many negative aspects (Mohamadnia, et al., 2014). For example, over-harvesting of some plant species such



as *Levisticum officinale* W.D.J.Koch (Apiaceae) and *Thymus carmanicus* Jalas (Lamiaceae) have reduced their populations in the study area and put them at risk of extinction. It is very imperative that in tourism areas, with proper management, harmful effects can be prevented as much as possible.

There are several approaches to protect plant species that can be divided into two groups: in-situ and ex-situ conservation (Huang, 2011; Liu et al., 2011). The two types of protection in-situ and ex-situ conservation are often not separate and in fact, complement each other (Hamilton, 2004; Havens et al., 2006; Yu et al., 2010). Ex-situ conservation aims to cultivate and naturalize endangered plant species and ensure their survival (Swarts & Dixon, 2009). One example of this is educating the native people about the proper use of wild plants in their area. However, the creation of protected areas today is one of the most important strategies for the conservation of biodiversity, which in many cases leads to the preservation, recovery, and increase of biodiversity (Chiarucci et al., 2001; Rodriguez et al., 2007; Ghahremaninejad et al., 2021b). The Galuchar Protected Area is one example of this in the study area to preserve and preserve a rare species *Juniperus excelsa*, which has largely been conserved. In general, in-situ conservation strategies can be very effective in preserving and balancing ecosystems by protecting plant and animal species diversity and are therefore definitely the best way to protect species in nature (Coley et al., 2003; Figueriedo & Grelle, 2009; Malekpourzadeh, et al., 2024). Creating natural gardens near the main site of plant growth in nature to cultivate and isolate endangered native plants in an area is another way to protect plant species (Hamilton, 2004; Schipmann et al., 2005; Strandby & Olsen, 2008). Especially for native, rare plant species, those with low growth and abundance, species that are very susceptible to disease, those that are widely exploited, and species that are generally endangered. These include the cultivation of large quantities of plants, the establishment of botanical gardens, and the establishment of a seed bank. In the case of plant cultivation, they can be produced in large quantities, in which case natural plants are protected and cultivated plants are used. On the other hand, access to these plants is easier and the costs of using them are reduced (Hamilton, 2004; Schipmann et al., 2005; Larsen & Olsen, 2007). Another advantage of plant cultivation is the controllability of various factors such as light, temperature, water, and humidity and such things as the level of toxins and pollutants in plant growth, so it is possible to increase productivity (Liu et al., 2011; Raina et al., 2011; Wong et al., 2014). In botanical gardens, a wide range of economically and ecologically diverse plant species are grown (Primack et al., 2009).

Even though there is a high level of biodiversity in the study area and on the other hand, there are various factors threatening this diversity, the implementation of strategies for the protection of natural ecosystems in the region is necessary.

The results obtained from a research in the region showed that the soils of the studied region have the soil texture of Sand, Loam Sandy, Loam Silt (according to the USDA soil texture classification). Some of the physical and chemical characteristics of soils depend on the elevation of the area. The results of saturation percentage and clay percentage decrease with increasing height, on the other hand with increasing. The percentage of lime, organic matter, organic carbon and gravel have increased. The results of the data obtained from the soil science studies and the analysis of the relevant samples showed that the average soil depth in the area where forest encroachment is mostly of juniper type is 20-50 cm, in the areas where the cover is dominated by log type, it is 10-40 cm in the areas where its vegetation is of almond type, it is 20-75 cm. The results of soil particle size distribution in relation to the type of forest vegetation also showed that the abundance of sand percentage in the texture of the soils under the dominant forest cover of juniper, bane, and almond, respectively, is 50-60, 80-90, 60-70%; and the abundance percentage of the above soils, respectively, 20-30, 5-20, and 50-22 (Esfandiarpour, 2005).

Acknowledgments

We thank Dr. John Edmondson and anonymous reviewers for their support and constructive suggestions on the manuscript. This study is part of LM's Ph.D. thesis at Kharazmi University (Tehran, Iran).

References

- Alizadeh, M., Ghorbani, A., Moameri, M., Badrzadeh Orang, M., Bidar Lord, M. & Sharifi, J. (2024). *Investigating the composition and diversity of plants and effective factors in different elevational classes in Alvares-Sabalan peak gradient*. Iranian Journal of Forest and Range Protection Research, 21(2), 336-316.
- Assadi, M. (Chief ed.) (1989-2023). *Flora of Iran*. vols. 1-183. Research Institute of Forests and Rangelands, Tehran.
- Bentley, R. (2010). *Medicinal plants*. London, Domville, Fife Press, p. 23-46.
- Bidarlord, M. & Ghahremaninejad, F. (2022). *A checklist of Iranian Grasses*. Phytotaxa, 574(1), 1-31.
- Bidar Lord, M., Dehdar Dargahi, M. & Jalili, A. (2021). *The vegetation in Hyrcanian submountain forests: The case of Tuli-Nesa forest in Gilan, Iran*. Taxonomy and Biosystematics, 13(46), 57-78.
- Campbell, C.S., Kellogg, E.A., Stevens, P.F., Donoghue, M.J. & Judd, W.S. (2003). *Plant systematics, A phylogenetic approach*. Sinauer Associates.
- Chiarucci, A., Maccherini, S. & De Dominicis, V. (2001). *Evaluation and monitoring of the flora in a nature reserve by estimation methods*. Biological Conservation, 101, 305-14. [https://doi.org/10.1016/s0006-3207\(01\)00073-8](https://doi.org/10.1016/s0006-3207(01)00073-8).
- Coley, P.D., Heller, M.V., Aizprua, R., Arauz, B., Flores, N., Correa, M., Gupta, M., Solis, P.N., Ortega Barria, E., Romero, L.I., Gomez, B., Ramos, M., Cubilla Rios, L., Capson, T.L. & Kursar, T.A. (2003). *Using ecological criteria to design plant collection strategies for drug discovery*. Frontiers in Ecology and the Environment, 1, 421-428. [https://doi.org/10.1890/1540-9295\(2003\)001\[0421:uctdpj\]2.0.co;2](https://doi.org/10.1890/1540-9295(2003)001[0421:uctdpj]2.0.co;2).
- Davis, P.H. (1965-1988) *Flora of Turkey and the East Aegean region*. vols. 1-9. Edinburgh University Press, Edinburgh.
- Dimitrijevic M.D (1973) Geology of the Kerman region. Geol. Survey Iran Rep. 52:334.
- Edmondson, J.R., Miller, A.G., Parris, B.S. (1980). *Plants of the Khabr va Rouchun protected areas*. Notes Royal Bot. Gard. Edinburgh, 38: 111-124.
- Esfandiarpour, P. (2005). *Investigation on soil's of forest trees in the Rabour Baft*. The second national conference on watershed management and water and soil resources management.

- Figueiredo, M.S.L. & Grelle, C.E.V. (2009). *Predicting global abundance of a threatened species from its occurrence, implications for conservation planning*. Diversity and Distributions, 15, 117-121. <https://doi.org/10.1111/j.1472-4642.2008.00525.x>.
- GeoCat. (2024). Retrieved from <https://geocat.ucar.edu/> <https://doi.org/10.5065/a8pp-4358>.
- Ghahreman, A. (1984-2008) *Flora of Iran*. vols. 4-25. Research Institute of Forests and Rangelands, Tehran.
- Ghahreman, A. & Attar, F. (1999) *Biodiversity of plant species of Iran*. Tehran University Press, Tehran.
- Ghahremaninejad, F. (2004). *The sections of Astragalus with bifurcating hair in Iran*. Turkish Journal of Botany, 28(1/2), 101-117.
- Ghahremaninejad, F., Bidarlord, M. & Attar, F. (2012). *Floristic study of steppe parts of Lissar protected area (N Iran)*. Rostaniha, 13(2), 164-188.
- Ghahremaninejad, F., Hoseini, E. & Jalali, S. (2021a). *The cultivation and domestication of wheat and barley in Iran, brief review of a long history*. Botanical Review, 87(1), 1-22. <https://doi.org/10.1007/s12229-020-09244-w>
- Ghahremaninejad, F., Hoseini, E. & Fereidounfar, S. (2021b). *Cities in drylands as artificial protected areas for plants*. Biodiversity and Conservation, 30, 243-248. <https://doi.org/10.1007/s10531-020-02079-2>
- Ghahremaninejad, F., Joharchi, M.R., Memariani, F. & Behroozian, M. (2022). *Astragalus nigriceps Popov (Fabaceae): an emended description with new data on distribution and conservation status*. Phytotaxa, 536(3), 243-251. <https://doi.org/10.11646/phytotaxa.536.3.4>
- Google Earth. Retrieved from <http://www.Google.com>. On: 10 Oct. 2019.
- Hamilton, A.C. (2004). *Medicinal plants, conservation and livelihoods*. Biodiversity and Conservation, 13, 1477-1517. <https://doi.org/10.1023/b:bioc.0000021333.23413.42>.
- Havens, K., Vitt, P., Maunder, M., Guerrant, E.O. & Dixon, K. (2006). *Ex situ plant conservation and beyond*. Bioscience, 56, 525-531. [https://doi.org/10.1641/0006-3568\(2006\)56\[525:espcab\]2.0.co;2](https://doi.org/10.1641/0006-3568(2006)56[525:espcab]2.0.co;2).
- Huang, H. (2011). *Plant diversity and conservation in China: planning a strategic bioresource for a sustainable future*. Botanical Journal of the Linnean Society, 166, 282-300. <https://doi.org/10.1111/j.1095-8339.2011.01157.x>.
- Iran Meteorological Organization (2000-2016). *Statistical data of Baft synoptic station*. Retrieved from <http://www.weather.ir>. On: 10 October 2017.
- Irannejad Parizi, M., Saneii Shariatpanahi, M., Zobairi, M. & Marvi Mohajer, M. (2002). *Floristic and phytogeographical study of Khahr National Park and Rouchoun wild life refuge*. Nature Resources 54(2), 111-127.
- IUCN (International Union for Conservation of Nature), (2019). *Guidelines for Using the IUCN Red List Categories and Criteria*. Version 14. Prepared by the Standards and Petitions Subcommittee. Available from: <http://www.iucnredlist.org/documents/RedListGuidelines.pdf> (accessed 20 June 2020).
- Larsen, H.O. & Olsen, C.S. (2007). *Unsustainable collection and unfair trade? uncovering and assessing assumptions regarding Central Himalayan medicinal plant conservation*. Biodiversity and Conservation, 16, 1679-97. <https://doi.org/10.1007/s10531-006-9039-4>.
- Li, D.Z. & Pritchard, H.W. (2009). *The science and economics of ex situ plant conservation*. Trends Plant Sci., 14, 614-621. <https://doi.org/10.1016/j.tplants.2009.09.005>.
- Linchen, Sh., Yu, H., Luo, H.M., Wu, Q., Li, ChF. & Steinmetz, A. (2016). *Conservation and sustainable use of medicinal plants: problems, progress, and prospects*. Chinese Medicine, 11, 37, 2-10. <https://doi.org/10.1186/s13020-016-0108-7>.
- Liu, C., Yu, H. & Chen, S.L. (2011). *Framework for sustainable use of medicinal plants in China*. Zhi Wu Fen Lei Yu Zi Yuan Xue Bao., 33, 65-68.
- Maassoumi, A.A. (1987-2006). *The genus Astragalus in Iran*. vols. 1-4. Research Institute of Forests and Rangelands, Tehran.
- Mahmoodi, M., Ghahremaninejad, F. & Maassoumi, A.A. (2022). *Diversity of vascular plants in Damirli Mountains (Zanjan Province, NW of Iran)*. Rostaniha, 23(Suppl. 1), 1-131.
- Majnounian, H., (1998). *Plant Geography of Iran (Application of plant geography in conservation)*. Green Circle Publications, pp. 65-110.
- Malekpourzadeh, L., Mirtadzadini S.M. & Nazeri V. (2015). *Floristic study of Raas Kooh region of Baft township, Kerman province, Iran*. Taxonomy and Biosystematics, 23, 85-94. <https://doi.org/10.1001.1.20088906.1394.7.23.8>.
- Malekpourzadeh, L., Ghahremaninejad, F. & Mirtadzadini S.M. (2024). *Collection and identification of some selected medicinal plants with antimicrobial properties from Takhte-Sartashtak Region, Kerman, Iran*. Journal of Medicinal Plants and By-Products, 1, 137-146. <http://doi.org/10.22034/jmpb.2023.128567>
- Mobayen, S. (1976-1996). *Vegetatives of Iran, flora of vascular plants*. vols. 1-4, Tehran University Press, Tehran.
- Moghanloo, L., Ghahremaninejad, F., Bidarlord, M. & Noraste Nia, A. (2023). *Diversity and distribution of endemic & threatened plant species in the Sorkhabad protected area, Zanjan, NW Iran and identification of the biodiversity hotspots in the area*. Natura Croatica, 32(1), 17-34 <https://doi.org/10.20302/NC.2023.32.2>
- Mohammadi, M., Ghahremaninejad, F. & Tavakkoli, Z. (2021). *Flora, life form, and a chorological study of Bazarjan region's vegetation in Markazi Province*. Taxonomy & Biosystematics, 13, 43-66.
- Mohamadnia, S.A., Khosravipour, B. & Hemmati, B. (2014). *The importance of tourism development in rural areas*. First National Conference on Green Tourism, 1-6.
- Mousavi, S., Mozaffarian, V., Mummehoff, K., Downie, S. R. & Zarre, S. (2020). *An updated lineage-based tribal classification of Apiaceae subfamily Apioideae with special focus on Iranian genera*. Systematics and Biodiversity, 19(1), 89-109.
- Payandeh, M., Bordbar, F. & Mirtadzadini, S.M. (2016). *Floristic study of Hanza Kooh from Bahr Aseman Conserved region, Kerman province, Iran*. Taxonomy and Biosystematics, 28, 79-100.
- Pimm, S., Russell, G., Gittleman, J. & Brooks, T. (1995). *The future of biodiversity*. Science, 269, 347-350. <https://doi.org/10.1126/science.269.5222.347>.



- Primack, R.B., Miller & Rushing, A.J. (2009). *The role of botanical gardens in climate change research*. New Phytologist, 182, 303-313. <https://doi.org/10.1111/j.1469-8137.2009.02800.x>.
- Podlech, D., Zarre, S. (2013) *A taxonomic revision of the genus Astragalus L. (Leguminosae) in the Old World*. 1-3 vols. Naturhistorisches Museum, Wien, 2439 pp.
- Rafieian Kopaei, M. (2013). *Medicinal plants and the human needs*. Journal of HerbMed. Pharmacology, 1, 1-2.
- Raina, R., Chand, R. & Sharma, YP. (2011). *Conservation strategies of some important medicinal plants*. Int. J. Med. Aromat. Plant, 1, 342-347.
- Rajaei, P., Maassoumi, A.A., Mozafarian, V., Nejadstari, T. & Pourmirzaee, A. (2011). *Floristic study of alpine region of Hezar Mountain, Kerman province, Iran*. Rostaniha, 9, 111-127.
- Rao, S.R., & Ravishankar, G.A. (2002). *Plant cell cultures: chemical factories of secondary metabolites*. Biotechnology Advances Journal, 20, 101-153. [https://doi.org/10.1016/s0734-9750\(02\)00007-1](https://doi.org/10.1016/s0734-9750(02)00007-1).
- Raunkiaer, C. (1934). *The life forms of plants and statistical plant geography*. Clarendon Press, Oxford.
- Rechinger, K.H. (ed.). (1963-2015). *Flora Iranica*. 1-174: Akademische Druck- u. Verlagsanstalt, Graz; 175: Akademische Verlagsgesellschaft, Salzburg; 176-181: Naturhistorisches Museum, Wien.
- Rodriguez, J.P., Brotons, L., Bustamante, J. & Seoane, J. (2007). *The application of predictive modelling of species distribution to biodiversity conservation*. Diversity and Distributions, 13, 243-251. <https://doi.org/10.1111/j.1472-4642.2007.00356.x>.
- Ross, I.A. (2005). *Medicinal plants of the world (volume 3): chemical constituents, traditional and modern medicinal uses*. New Jersey: Humana Press Inc, p. 110-132
- Saberi, A., Hasanabadi, Z., Mirtadzadini, S.M. & Nazeri, V. (2013). *Floristic study of Riseh and Paghaleh region of Shahrbabak township*. Taxonomy and Biosystematics, 14, 67-78.
- Schoen, D.J. & Brown, A.H.D. (2001). *The conservation of wild plant species in seed banks*. Bioscience, 51, 960-966. [https://doi.org/10.1641/0006-3568\(2001\)051\[0960:tcowps\]2.0.co;2](https://doi.org/10.1641/0006-3568(2001)051[0960:tcowps]2.0.co;2).
- Semwal, D.P., Saradhi, P.P., Nautiyal, B.P. & Bhatt, A.B. (2007). *Current status, distribution and conservation of rare and endangered medicinal plants of Kedarnath Wildlife Sanctuary, Central Himalayas, India*. Curr. Sci. India, 92, 1733-1738.
- Schipmann, U., Leaman, D.J., Cunningham, AB. & Walter, S. (2005). *Impact of cultivation and collection on the conservation of medicinal plants, global trends and issues*. Acta Horticulturae, 676, 31-44. <https://doi.org/10.17660/actahortic.2005.676.3>.
- Soule, M.E., Estes, J.A., Miller, B. & Honnold, D.L. (2005). *Strongly interacting species, conservation policy, management, and ethics*. Bioscience, 55, 168-176. [https://doi.org/10.1641/0006-3568\(2005\)055\[0168:siscpm\]2.0.co;2](https://doi.org/10.1641/0006-3568(2005)055[0168:siscpm]2.0.co;2).
- Strandby, U. & Olsen, C.S. (2008). *The importance of understanding trade when designing effective conservation policy: the case of the vulnerable Abies guatemalensis Rehder*. Biol Conserv., 141, 2959-2968. <https://doi.org/10.1016/j.biocon.2008.08.023>.
- Swarts, N.D. & Dixon, K.W. (2009). *Terrestrial orchid conservation in the age of extinction*. Annals of Botany, 104, 543-556. <https://doi.org/10.1093/aob/mcp025>.
- Thiers, B. (2024 [Continuously updated]) *Index Herbariorum: A global directory of public herbaria and associated staff*. New York Botanical Garden's Virtual Herbarium. Available from: <http://sweetgum.nybg.org/ih/> (accessed 1 January 2024).
- Townsend, C.C. (1966-1985). *Flora of Iraq*. vols. 1-9. Ministry of Agriculture and Agrarian Reform, Baghdad.
- Upreti, Y., Asselin, H., Dhakal, A. & Julien, N. (2012). *Traditional use of medicinal plants in the boreal forest of Canada, review and perspectives*. Journal of Ethnobiology Ethnomedicine, 8, 1-14. <https://doi.org/10.1186/1746-4269-8-7>.
- Wong, K.L., Wong, R.N., Zhang, L., Liu, W.K., Ng, T.B., Shaw, P.C., Kwok, P.C.L., Lai, Y.M., Zhang, Z.J., Zhang, Y.B., Tong, Y., Cheung, H., Lu, J. & Wing, S.C. (2014). *Bioactive proteins and peptides isolated from Chinese medicines with pharmaceutical potential*. Chinese Medicine, 9, 19. <https://doi.org/10.1186/1749-8546-9-19>.
- Yu, H., Xie, C.X., Song, J.Y., Zhou, Y.Q. & Chen, S.L. (2010). *TCMGIS II based prediction of medicinal plant distribution for conservation planning: a case study of Rheum tanguticum*. Chinese Medicine, 5, 31. <https://doi.org/10.1186/1749-8546-5-31>.
- Zohary, M. (1973) *Geobotanical foundations of the Middle East (Geobotanica selecta 3)*. vols. 1-2. Stuttgart: Gustav Fischer Verlag, Amsterdam.



<http://dx.doi.org/10.22108/TBJ.2024.141181.1256>