



RESEARCH PAPER

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The flora of Sarigol National Park, Northern Khorassan Province, Iran

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Abstract

Sarigol National Park is located at Northern Khorassan province, at NW Esfarayen between $36^{\circ} 55' - 37^{\circ} 02' N$, $57^{\circ} 41' - 57^{\circ} 47' E$. The vascular flora of this park was investigated in the years 2008–2009. A total of 975 plant specimens were collected and 498 taxa (species, subspecies and variety), belonging to 291 genera and 70 families were identified. The life form rates of the taxa were as follows: Therophyte (34.9%), Hemicryptophyte (33.9%), Geophyte (13.3%), Chamaephyte (10.5%) and Phanerophyte (7.4%) respectively. The phytogeographical affinities of the species were as follows: Irano-Turanian (60.8%), Irano-Turanian, Euro-Siberian & Mediterranean (10.3%), Irano-Turanian & Mediterranean (8.7%), Irano-Turanian & Euro-Siberian (5.6%), Irano-Turanian & Sahara-Sindian (2.5%), Pluriregional (6.7%) and Cosmopolite (2.9%). Of these, 26 taxa (5.2%) are endemic to Iran and 37 taxa (7.4%) are in the international IUCN list. Finally, the results of this research compared with other studies carried out near the study area.

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Introduction

National Parks are indicative samples of nature in each country and have much value in different fields such as: conservation, education, research and tourism. National Parks are important, because they protect a large number of different animal and plant species. Many of these plants or animals are endangered if they live in another area that is not protected by the government.

Sarigol National Park is one of these regions that were protected in 1974 under name of “Shah Jahan Protected Region”. After 1978, this area was renamed to “Sarigol Protected Region”. According to current ratification, 20% of space of every Protected Region, for protection of its ecological value, completely is preserved as “Safe region”. Thus, in 1979 a part of this region, about 8000 Ha is separated and named “Sarigol Safe Region”. Because of full conservation of the safe region during 24 years, its natural richness grew and then this region is upwelled to “Sarigol National Park” in 2002.

It is important to mention here that the Khorassan province is now divided to three separated provinces: Razavi Khorassan, Southern Khorassan, and Northern Khorasan; it is located in NE of Iran, covering an area of 313, 335 sq. km. But in Flora Iranica treatments and several other works usually the former Khorassan is used. Recently some articles are published as a supplement for Flora Iranica about Khorassan’s flora, i.e. Ghahremaninejad *et al.* 2005, 2010, 2012; Joharchi *et al.* 2007, 2011.

Location and Topography

The Sarigol National Park is located at Northern Khorassan province, at NW Esfarayen between $36^{\circ} 55' - 37^{\circ} 02' N$, $57^{\circ} 41' - 57^{\circ} 47' E$. The nearest cities to this area are Esfarayen at 25 Km NW, Bojnurd at 90 Km N and Sabzevar at 105 Km S from the study area, respectively. There is not any village inside the boundary of this region, but the nearest villages to it are Nasr Abad and Dahaneye Ojagh that are situated

at SW and SE from the park, respectively. The region was declared as a National Park in 2002 (Fig. 1).

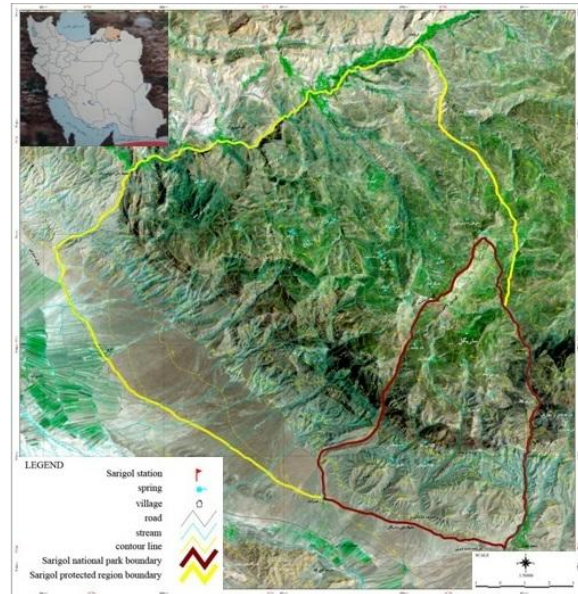


Fig. 1. Map of the study area (Red and Yellow boundaries are Sarigol National Park and Sarigol Protected Region, respectively).

The difference in height between the highest area in the northern mountain (2840 m) and the lowest area in the southern plain (1400 m) is about 1440 m. This elevation variance builds variety of ecosystems in the study area, thus its biodiversity enhances. Geomorphologically, this area is divided to two parts: plain-hilly and mountain. Hilly almost is without any plants. In the present work, vegetation of plain and mountainous regions of this park was compared. Northern of the park is mountainous and includes 3/4 of total of the park. The elevation of the area ranges from 1700 to 2840 m and Bil Baghli Mt is the highest peak in this park. This regions are habitat of tree and shrub species such as: *Juniperus excelsa*, *Berberis integrima*, *Rosa beggeriana*, *Salix acmophylla* and pulvinate species of genera such as: *Acantholimon*, *Acanthophyllum* and *Onobrychis*. South part of the park includes plain and hilly regions that contain 1/4 of total of the park. The elevation of the area ranges from 1440 to 1700 m. This regions are habitat of annual species and bush species of genera such as: *Artemisia*, *Cousinia*, *Stachys* and *Rosa*.

Some species found in both mountainous and plain-hilly regions such as: *Acanthophyllum glandulosum*, *Acanthophyllum sordidum*, *Acroptilon repens*, *Astragalus suluklensis*, *Astragalus meschedensis*, *Capparis spinosa*, *Cardaria draba*, *Ceratocarpus arenarius*, *Clypeola jonthlaspi*, *Descurainia Sophia*, *Holosteum glutinosum*, *Lappula sinaica*, *Malcolmia Africana*, *Nonnea caspica*, *Pulicaria dysenterica*.

Climate

A total of the study area is 7037 hectares. The elevation of the area ranges from 1400 to 2940 m. The median annual rain is 273 mm and the median annual temperature is 14°C. The climate of this region is cold-semiarid and clearly reflects in the flora and vegetation of the study area.

According to available data from the nearest climatological station (Nodeh Chenara station, during 1988–2004) the median annual temperature is 12.26°C. The coldest month is January with a minimum temperature of -3.85°C and the warmest month is July with a maximum temperature of 30.59°C (Fig. 2).

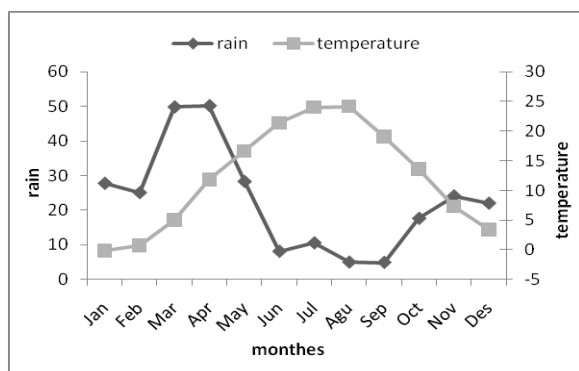


Fig. 2. Ombrothermic climatic diagram of the study area.

In the north regions of the park, high mountains, winter is cool and long and the soil is covered with snow during almost 4–6 months of year. Against the south parts, wide plain, has rather warm weather. In our study area, winter fall is snow and it stays on higher altitude until end of the spring. In early spring, snowfall replaces with rainfall. In this time, vegetation of the area is included bulbous and

rhizomatous species such as: *Tulipa spp.*, *Iris spp.*, *Gagea spp.*, *Fritillaria gibbosa* and *Muscari neglecta* and higher regions still are without any plant. With gradual melting of the snow and warming the weather, some of species such as: *Adonis annua*, *Corydalis rupestris*, *Arum kotschyi*, *Allium spp.* and many species of *Papaveraceae* and *Brassicaceae* families observe in the area. To end of spring, many plant species complete their flowering phase and in the end of summer get to the fruiting stage. After this process, in autumn, most of plants burn and shrivel. In this season, precipitation is almost rare and the park becomes completely dry. Halophytes, especially family *Chenopodiaceae*, grow in the area in autumn. In start of winter, the study area is just about without any plant.

Materials and methods

A total of 975 plant specimens were collected from the area, during three seasons –summer, autumn and spring – of 2008 and 2009. The specimens were prepared according to standard herbarium techniques. The nomenclature, life form, chorology and distribution of each species are based on Flora Iranica (Rechinger, 1963–2010), Flora of the USSR (Komarov, 1968–2001), Flora of Turkey (Davis, 1965–1988), Flora of Iraq (Townsend *et al.*, 1966–1988), Flora Europeae (Tutin *et al.*, 1964–1980), Flora of Iran (Assadi *et al.*, 1988–2011) and the number of the available papers. Number of genera of each family and number of species of each genus were determined with “The Plant Book” (Mabberley, 2008).

Endemism of each species was determined with Flora Iranica (Rechinger, 1963-2010), Flora of Iran (Assadi *et al.*, 1988–2011) and Biodiversity of Plant Species in Iran (Ghahreman & Attar, 1998). The plant species of this park was checked with international IUCN (International Union for Conservation of Nature) list and their status in this list were denoted with Red Data Book of Iran (Jalili & Jamzad, 1999).

The species list is provided in the appendix. All vouchers were deposited at the Farabi herbarium (FAR) of Kharazmi University, Tehran, Iran.

Results and discussion

Floristic diversity

975 plant specimens were collected from the study area. A total of 70 families, 291 genera, 498 taxa –18 species, 46 subspecies and 34 varieties– were identified (see appendix). One family belongs to pteridophytes. Three families belong to gymnospermes, while the other 66 families are angiospermae, dicotyledones and monocotyledones with 54 and 12 families, respectively (Tab. 1).

Table 1. The diversity of taxonomic groups in the study area.

Plant Groups	Family	Genus	Taxon (sp., subsp.,var.)
<i>Pteridophytes</i>	1	1	1
<i>Spermatophytes</i>	69	290	498
<i>Gymnosperms</i>	3	3	3
<i>Angiosperms</i>	66	287	491
<i>Dicotyledones</i>	54	239	411
<i>Monocotyledones</i>	12	48	80
Total	70	291	498

Large families in terms of number of genera and species are *Asteraceae* (13.6%), *Fabaceae* (12.1%), *Poaceae* (8.6%), *Brassicaceae* (8.1%), *Lamiaceae* (5.6%), *Boraginaceae* (4.4%), *Apiaceae* (3.8%), *Rosaceae* (3.6%), *Liliaceae* (3.2%), *Caryophyllaceae* (3.1%), *Ranunculaceae* (2.8%), *Scrophulariaceae* (2.4%), *Chenopodiaceae* (2.2%) (Fig. 3).

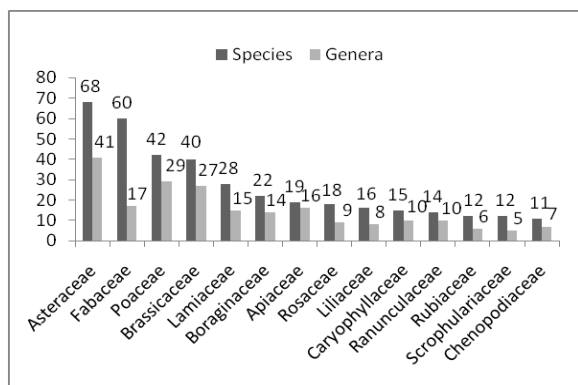


Fig. 3. The large ten families in terms of number of genera and species in the study area.

The genera with the highest species richness are *Astragalus* (5.8%), *Cousinia* (1.8%), *Allium*, *Vicia*, *Gagea*, *Alyssum* (1.4%), *Veronica*, *Lappula*, *Galium* (1.2%), *Cirsium*, *Onobrychis*, *Euphorbia*, *Cotoneaster* (1.1%), *Cerasus*, *Centaurea*, *Bromus*, *Tragopogon*, *Stachys*, *Salvia*, *Hyoscyamus*, *Hordeum* (0.8%) (Fig. 4).

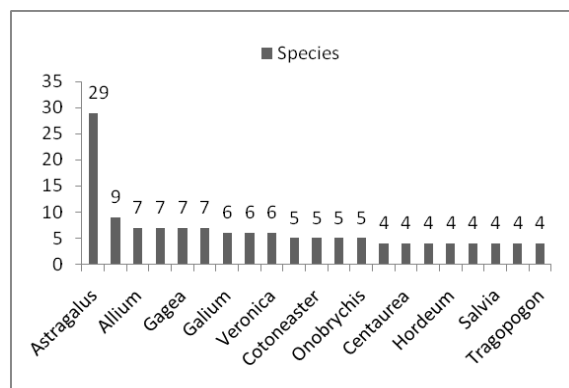


Fig. 4. The large genera in terms of number of species in the study area.

Habitat

According to the done observation and survey on the area, there are four diverse habitats and a variety of vegetation in the different parts of the park:

1- Plain regions: They include the flat and wide plains that are at south of study area. These parts are arider than the mountains. Some of the taxa of this area are: *Acinos graveolens*, *Adonis annua* subsp. *cupaniana*, *Alcea rhyticarpa* var. *rhyticarpa*, *Alhagi pseudalhagi*, *Allium rubellum*, *Allium scabriscapum*, *Alyssum dessertorum*, *Amygdalus spinosissima* subsp. *turcomanica*, *Androsace maxima*, *Arnebia decumbens*, *Artemisia kopetdaghensis*, *Astragalus schahrudensis*, *Ceratocephalus falcata*, *Consolida rugulosa* forma *rugulosa*, *Cousinia monocephala*, *Descurainia Sophia*, *Echinops chorassanicus*, *Fumaria asepala*, *Gladiolus atroviolaceus*, *Hedysarum wrightianum*, *Hypecoum pendulum* var. *pendulum*, *Iris songarica*, *Ixiolirion tataricum*, *Kochia scoparia*, *Lappula drabovii*, *Melica persica*, *Nonnea turcomanica*, *Papaver dubium*, *Peganum harmala* var. *harmala*, *Roemeria hybrid* subsp. *dodecandra*, *Scabiosa olivieri*, *Siebera nana*, *Sisymbrium loeselii*, *Stipa barbata*, *Valerianella*

cymbicarpa, *Verbascum cheiranthifolium* var. *transcaspicum*, *Xeranthemum longipapposum*.

2- Mountainous regions: These regions are placed at north of the park and include their mountains and valleys. These areas are divided to two parts: arid mountainous regions and humid mountainous regions. **a. Arid mountainous regions:** The first groups are situated at central regions of the park and they are arid and hot. The plant species of this part are: *Acantholimon erinaceum*, *Acanthophyllum glandulosum*, *Allium kuhsorkhensis*, *Allium xiphopetalum*, *Anemon petiolulosa*, *Astragalus siversianus*, *Berberis integerrima*, *Bieberstiana multifida*, *Bryonia aspera*, *Caccinia macranthera*, *Carum carvi*, *Clematis orientalis*, *Colchicum Kotschyi*, *Colutea buhsei*, *Conium maculatum*, *Corydalis aitchisonii*, *Cotoneaster nummularioides*, *Cousinia microcarpa*, *Crambe kotschyana*, *Cruciata taurica* subsp. *Persica*, *Ephedra intermedia*, *Ferulago angulata*, *Fibigia suffraticosa*, *Gundelia tournefortii*, *Holosteum glutinosum*, *Hymenocrater platystegius*, *Hypericum scabrum*, *Juniperus excelsa*, *Linum glaucum*, *Lonicera nummularioides*, *Paracaryum turcomanicum*, *Pistacia khinjuk*, *Prangos latiloba*, *Rosa beggeriana*, *Rubia florida*, *Salix acmophylla*, *Senecio paulsenii* subsp. *khorasanicus*, *Thesium kotschyi*, *Tragopogon buphthalmoides* var. *buphthalmoides*, *Tulipa biflora*, *Tulipa micheliana*, *Vincetoxicum pumilum*, *Zygophyllum atriplicoides*. **b. Humid mountainous regions:** The second groups are located at north of the park and they are higher, more humid and colder than arid mountains. The plant species in this part are: *Allium longicuspis*, *Arctium minus*, *Arum kotschyi*, *Asperugo procumbens*, *Asperula glomerata*, *Cerasus chorassanica*, *Chalcanthus remfolius*, *Corydalis chionophila*, *Elaeosticta allioides*, *Erigeron acer* subsp. *pycnotrichus*, *Epilobium hirsutum*, *Equisetum ramosissima*, *Ficaria kochii*, *Gagea dschangoria*, *Galagania platypoda*, *Glaux maritime*, *Hordeum brevisubulatum*, *Hyacinthus litwinowii*, *hyoscyamus turcomanicus*, *Juncus articolatus*, *Leptorhabdos*

parviflora, *Nigella integrifolia*, *Orchis paluster*, *Peltaria turkmena*, *Plantago lanceolata*, *Poa bulbosa*, *Polygonatum sewerzowii*, *Ranunculus afghanicus*, *Rumex pulcher* subsp. *divaricatus*, *Solenanthes circinatus*, *Spinacia turkestanica*, *Stellaria media*, *Tamarix ramosissima*, *Triglochin palustris*, *Tussilago farfara*, *Typha grossheimii*, *Valeriana ficariifolia*, *Veronica czerniakowskiana*, *Zeravschania aucheri*.

3- Manipulated regions: These parts are almost located at south of the park and near to the villages. They include areas that used for farming and gardening. The existence of these areas is risky for the around ecosystems. Some of plant species in this area are: *Amygdalus communis*, *Calendula officinalis*, *Capsella bursa-pastoris*, *Cardaria draba*, *Carex divisa*, *Centaurea depresa*, *Convolvulus arvensis*, *Ficus carica*, *Goldbachia laevigata*, *Juglans regia*, *Lactuca serriola*, *Lens orientalis*, *Malva neglecta*, *Medicago sativa*, *Melilotus officinalis*, *Pinus eldarica*, *Populus nigra* subsp. *caudina*, *Punica granatum*, *Ranunculus arvensis*, *Sonchus oleraceus*, *Trifolium repens* subsp. *repens*, *Ziziphus jujuba*.

4- Landslides regions: These regions include slope of mountains and areas located between plains and mountains. They are rather arid and warm. Some examples of the species growing in this area are: *Aethionema carneum*, *Astragalus gompholobium*, *Astragalus meschedensis*, *Bellevalia saviczii*, *Bongardia chrysogonum*, *Bunium intermedium*, *Capparis spinosa*, *Chrozophora hierosolymitana*, *Cleome coluteoides*, *Elaeagnus angustifolia*, *Eremostachys regeliana*, *Erodium cicutarium*, *Fritillaria gibbosa*, *Gagea gageoides*, *Glaucium elegans*, *Glycyrrhiza glabra* var. *glandulifera*, *Geranium kotschyi*, *Koelpinia linearis*, *Lamium amplexicaule*, *Launea acanthodes*, *Muscari neglectum*, *Orobanch cernua*, *Phlomis cancellata*, *Salvia hypoleuca*, *Sophora pachycarpa*, *Stroganowia litwiinovi*, *Trichodesma incanum*, *Tulipa Montana* var. *montana*, *Vicia ervilia*, *Viola occulta*, *Zosima absinthifolia*.

Life form

The life form of plant species was determined by Raunkiaer's classification (Raunkiaer 1934). In this park, the dominant life form is hemicryptophyte. The life form rates of the taxa were as follows: Therophyte (34.9%), Hemicryptophyte (33.9%), Geophyte (13.3%), Chamaephyte (10.5%) and Phanerophyte (7.4%) respectively (Fig. 5).

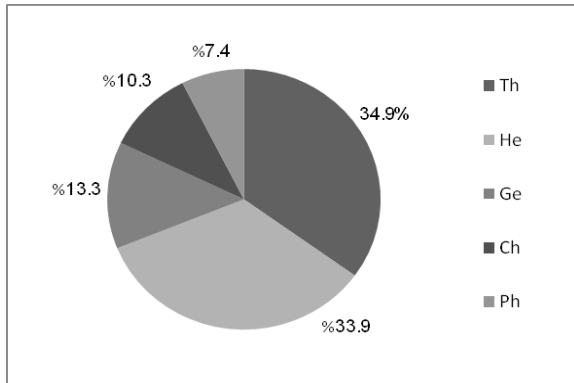


Fig. 5. The life form of the species in the study area.

Chorology

The Chorological affinities of plant species were as follows: Irano-Turanian (60.8%), Irano-Turanian, Euro-Siberian & Mediterranean (10.3%), Irano-Turanian & Mediterranean (8.7%), Irano-Turanian & Euro-Siberian (5.6%), Irano-Turanian & Sahara-Sindian (2.5%), pluriregional (6.7%) and cosmopolite (2.9%). Irano-Turanian elements compose more than half of the plant species and they are the dominant chorotypes in this park (Fig. 6).

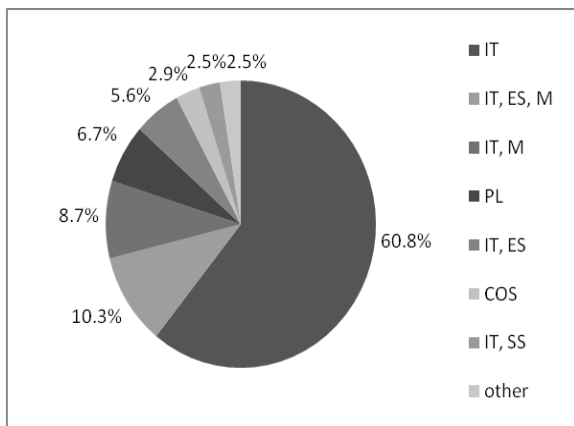


Fig. 6. The Chorological affinities of plant species in the study area.

Endemism

Number of endemic taxa in the study area is 26 taxa – 21 species, two subspecies and three varieties– and the endemism rate is 5.2 percent. 23 taxa of those belong to the Irano-Turanian phytogeographic floristic region. Eight and two taxa of those belong to Khorassan region (including Razavi Khorassan, Southern Khorassan, and Northern Khorassan) and Northern Khorassan province, respectively (Tab. 3).

IUCN categories

IUCN Red List of threatened species contains eight categories: extinct (there is no reasonable doubt that the last individual has died), extinct the wild (it is known only to survive in cultivation), critically endangered (it is facing an extremely high risk of extinction in the wild in the immediate future), endangered (it is facing a very high risk of extinction in the wild in the near future), vulnerable (it is facing a high risk of extinction in the wild in the medium term future), lower risk (it is facing a low risk of extinction in the wild), data deficient (there is inadequate information to make a direct or indirect, assessment of its risk of extinction based on its distribution or population status) and not evaluated (it has not yet been assessed against the criteria). The plant species of Iran include four categories: vulnerable, lower risk, data deficient and not evaluated. The plant species of Sarigol National Park were checked with international IUCN list and of those, 37 taxa (7.4%) situate in the different stages of IUCN list. One taxon is in vulnerable rank. 12, 24 and 461 taxa are in data deficient rank, lower risk rank and not evaluated rank, respectively (Tab. 3).

Medicinal plants

Between a total of 498 plant taxa were collected from the area, about 152 taxa (30.5%) have medicinal value, such as: *Achillea wilhelmsii*, *Alhagi pseudalhagi*, *Amygdalus spinosissima*, *Anchusa italica*, *Capsella bursa-pastoris*, *Cichorium intybus*, *Cotoneaster nummularioides*, *Conium maculatum*, *Ephedra intermedia*, *Glycyrrhiza glabra*, *Lallemantia royleana*, *Peganum harmala*, *Plantago*

lanceolata, *P. major*, *Rumex pulcher*, *Stachy lavandulifolia*, *Teucrium polium*, *Tussilago farfara*, *Xantium spinosum*, *Ziziphus jujube*. The above list is prepared based on Zargari (1968–1995).

Reports

According to obtained data during this research, four, seven, 90 and 471 taxa are defined for the first time from East of Iran, Khorassan region, Northern Khorassan province and Sarigol National Park, respectively.

In addition to, in appendix several natural pictures of plant taxa of the park are selected.

Comparisons

Floristic study on conserved area is very important for botanists and ecologists thus the same researches always are doing on different regions.

The results of this research compared with other studies carried out near the study area (according to Sorenson similarity index). There are some

differences and likeness between our study area and them. The obtained results from this research show that Sarigol National Park has the most similarity with Saluk National Park (Ezazi *et al.*, 2012). (Tab. 2).

Recently a paper is published about the flora of Protected Region Sarigol (Nadaf & Mortazavi 2011). Sarigol area is divided to two parts: a- park, b- protected area. But based on the Nadaf and Mortazavi (2011) the studied area (28000 hectares) is larger than the protected part alone. In real the protected part has an area with 21309 hectares and the park part with 7037 hectares. Thus the Sarigol area includes an area nearly 28346 hectares. We result their studies area including park and the protected area. There is no map in their work and the geographic situation is (latitudes and longitudes) not so fit to the Sarigol area.

Table 2. Comparison of Sarigol National Park with other study areas.

Characteristic/Region	Sarigol national park (The present study)	Saluk national park (Ezazi, 2009)	Southwestern slopes of Binaloud elevations (Ghahreman <i>et al.</i> 2006)	Chahchaheh Pistacia forest (Saberi <i>et al.</i> 2010)	Darkesh area (Aydani <i>et al.</i> 2008)
Province	Northern Khorassan	Northern Khorassan	Razavi Khorassan	Razavi Khorassan	Northern Khorassan
Township	Esfarayen	Esfarayen	Neyshabur-Mashhad	Sarakhs-Kalat	Bojnurd
Total area	7037 ha	8231 ha	500 km ²	3000 ha	4000 ha
Altitude range	1400–2940 m	1150–2170 m	1300–3500m	–	100–2455 m
Median annual temperature	14° C	12° C	14.25° C	17.9° C	15° C
Median annual rain	273 mm	282 mm	239.9 mm	254.8 mm	502.95 mm
Number of family	70	71	67	36	76
Number of genus	291	296	299	160	310
Number of taxa	498	505	487	252	506
Sorenson similarity index	–	326 sp. similar & 65% similarity	218 sp. similar & 44% similarity	102 sp. similar & 27% similarity	177 sp. similar & 25% similarity

Appendix 1. Checklist of vascular plants of Sarigol National Park.

Abbreviations used in this article: Th. = Therophyte, He. = Hemicryptophyte, Ge. = Geophyte, Ch. = Chamaephyte, Ph. = Phanerophyte, IT. = Irano-Turanian, ES. = Euro-Siberian, M. = Mediterranean, SS. = Sahara-Sindian, PL. = Pluriregional, COS. = Cosmopolite, NE. = Not Evaluated, DD. = Data Deficient, LR. = Lower Risk, VU. = Vulnerable, En. = Endemic, subsp. Species, var. = Variety.

Our results from 7037 hectares show 495 species, 291 genera and 70 families, whereas they resulted for a bigger area, 28000 hectares, 25 families, 66 genera and 25 species. They did not mention 441 species that we mentioned here.

As a result, it seems that Nadaf and Mortazavi's work (2011) has covered a few of floristic richness of Sarigol area and in real is seems to be so partial study.

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
Pteridophyta					
Equisetaceae					
<i>Equisetum ramosissimum</i> Desf.	Ge	PL	-	NE	5678, 5800, 6356
Gymnospermae					
Cupressaceae					
<i>Juniperus excelsa</i> M. B.	Ph	IT	-	NE	5700, 5703, 6413, 6438
Ephedraceae					
<i>Ephedra intermedia</i> Schrenk & C. A. Mey.	Ch	IT	-	NE	5560, 5707, 5848, 5931, 6493
Pinaceae					
<i>Pinus eldarica</i> Medw.	Ph	IT	-	NE	6483
Angiospermae: Dicotyledoneae					
Amaranthaceae					
<i>Amarantus retroflexus</i> L.	Th	PL	-	NE	5775
Anacardiaceae					
<i>Pistacia khinjuk</i> Stocks	Ph	IT	-	NE	5683
Apiaceae					
<i>Bunium cylindricum</i> (Boiss. & Hohen.) Drude	Ge	IT	-	NE	6051, 6240, 6280
<i>Bunium intermedium</i> Korov	Ge	IT	-	NE	6083, 6108
<i>Bupleurum exaltatum</i> M. B.	Ch	IT	-	NE	5584, 5699
<i>Carum carvi</i> L.	He	IT, ES	-	NE	5704
<i>Conium maculatum</i> L.	He	PL	-	NE	6143
<i>Elaeosticta allioides</i> (Regel & Schmalh.) Kljuyk. & Al.	Ge	IT	-	NE	6340
<i>Eryngium billardieri</i> F. Delaroche	He	IT	-	NE	6323
<i>Eryngium bungei</i> Boiss.	He	IT	-	NE	5705, 6245, 6257
<i>Falcaria vulgaris</i> Bernh.	He	IT, ES, M	-	NE	6105, 6511
<i>Ferula ovina</i> (Boiss.) Boiss.	He	IT	-	NE	6077
<i>Ferulago angulata</i> (Schlecht.) Boiss.	He	IT	-	LR	5847, 6510
<i>Galagania platypoda</i> (Aitsch. & Hemsl.) M. Vassilsz. & M. pimen.	Ge	IT	-	NE	6339
<i>Malabaila secacul</i> (Miller) Boiss. subsp. <i>secacul</i>	He	IT	-	NE	6264
<i>Prangos latiloba</i> Korov.	He	IT	-	NE	5981, 6212
<i>Scandix aucheri</i> Boiss.	Th	IT	-	NE	5605
<i>Scandix stellata</i> Bank & Soland.	Th	IT, M	-	NE	5951, 6040, 6269, 6406

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
<i>Turgenia latifolia</i> (L.) Hoffm.	Th	IT, ES	-	NE	6446
<i>Zerauschania aucheri</i> (Boiss.) M. Pimen.	He	IT	En	NE	6437
<i>Zosima absinthifolia</i> (Vent.) Link.	He	IT	-	NE	5615, 5919
Asclepiadaceae					
<i>Vincetoxicum pumilum</i> Decne.	He	IT, ES	-	LR	5681, 6359
Asteraceae					
<i>Achillea bibersteinii</i> Afan.	He	IT	-	NE	6272, 6282, 6436
<i>Achillea wilhelmsii</i> C. Koch	He	IT	-	NE	5541, 6107
<i>Acroptilon repens</i> (L.) DC. subsp. <i>australe</i> (Iljin.) Rech. f.	He	IT	-	NE	5619
<i>Arctium minus</i> (Hill) Bernh.	He	ES (M)	-	NE	6315
<i>Artemisia aucheri</i> Boiss.	Ch	IT	-	NE	5694
<i>Artemisia kopetdagensis</i> Krasch.	Ch	IT	-	NE	5555
<i>Artemisia sieberi</i> Besser subsp. <i>sieberi</i>	Ch	IT, ES, M	-	NE	5811
<i>Calendula officinalis</i> L.	Th	IT, EH	-	NE	5626
<i>Carduus pycnocephalus</i> L. subsp. <i>albidus</i> (M. B.) Hazmi	Th	IT, M (ES, SS)	-	NE	6194
<i>Carthamus oxyacantha</i> M. B.	Th	IT, ES, M	-	NE	6486
<i>Centaurea balsamita</i> Lam.	Th	IT	-	LR	5751
<i>Centaurea depressa</i> M. Bieb.	Th	IT	-	NE	5654, 6130, 6193
<i>Centaurea iberica</i> Trev. ex Spreng.	He	IT, ES	-	NE	5713, 6450
<i>Centaurea virgata</i> Lam. subsp. <i>squarrosa</i> (Willd.) Gugler	Ch	IT	-	NE	5546, 5551, 5727, 6263
<i>Chondrilla juncea</i> L.	He	IT, ES, M	-	NE	5689, 5795
<i>Cichorium intybus</i> L.	He	PL	-	NE	5740, 5807
<i>Cirsium arvense</i> (L.) Scop. var. <i>incanum</i> (S. G. Gmelin) Ledeb.	Th	PL	-	NE	5714
<i>Cirsium bornmulleri</i> Sint. ex Bornm.	He	IT	-	NE	6266
<i>Cirsium congestum</i> Fisch. & C. A. Mey. ex DC. var. <i>congestum</i>	He	IT	-	NE	5782
<i>Cirsium echinus</i> (M. B.) Hand-Mzt.	Th	IT	-	NE	5996, 6098
<i>Cirsium vulgare</i> (Savi) Ten.	He	PL	-	NE	6504
<i>Codonocephalum peacockianum</i> Aitch. & Hemsl.	He	IT	-	NE	6369
<i>Conyza bonariensis</i> (L.) Cronq.	Th	COS	-	NE	5724
<i>Conyzanthus squamatus</i> (Spreng.) Tamamsch.	Th	PL	-	NE	5697, 5806
<i>Cousinia diezii</i> Rech. f.	Th	IT	En	DD	6460
<i>Cousinia eryngioides</i> Boiss.	He	IT	-	NE	6122, 6367

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
<i>Cousinia lepida</i> (Bunge ex) Boiss.	Ch	IT	En	LR	6242
<i>Cousinia microcarpa</i> Boiss.	He	IT	-	NE	6086, 6275, 6326
<i>Cousinia monocephala</i> Bunge	He	IT	En	DD	5570, 5656, 5781, 6119, 6230, 6265
<i>Cousinia</i> sp.	Ch	-	-	-	6372
<i>Cousinia</i> sp.	Ch	-	-	-	6396
<i>Cousinia</i> sp.	He	-	-	-	6427
<i>Crepis sancta</i> (L.) Babcock subsp. <i>iranica</i> Rech. f.	Th	IT, M	-	NE	5611, 5930
<i>Cymbolaena griffithii</i> (A. Gray) Wagenitz	Th	IT, ES	-	NE	6247, 6309
<i>Echinops chorassanicus</i> Bunge	He	IT	En	LR	5612
<i>Echinops ritrodes</i> Bunge	He	IT	-	NE	6334
<i>Erigeron acer</i> L. subsp. <i>pycnotrichus</i> (Vierh.) Grierson	He	PL	-	DD	6317
<i>Filago arvensis</i> L.	Th	IT, ES	-	NE	6327
<i>Gundelia tournefortii</i> L.	He	IT	-	NE	6059
<i>Jurinea monocephala</i> Aitch. & Hemsl. subsp. <i>sintensisii</i> (Bornm.) Wagenitz	Ch	IT	-	DD	6324, 6420, 6435
<i>Koelpinia linearis</i> Pall.	Th	IT, SS	-	NE	6057, 6065, 6204
<i>Lactuca serriola</i> L.	He	IT, ES, M	-	NE	5733, 5741, 5810, 5849
<i>Launea acanthodes</i> (Boiss.) O. Kuntze	He	IT	-	NE	5744, 5766, 6297
<i>Leontodon asperrimus</i> (Willd.) Boiss. ex Ball.	He	IT	-	NE	6307
<i>Psychrogeton alexeekoi</i> Krasch.	He	IT	-	DD	5796
<i>Pulicaria dysenterica</i> (L.) Bernh.	He	IT, ES, M	-	NE	5709
<i>Pulicaria gnaphalodes</i> (Vent.) Boiss.	Ch	IT	-	NE	5728, 5767
<i>Pulicaria salviifolia</i> Gunge	Ch	IT	-	NE	5589
<i>Scariola orientalis</i> (Boiss.) Sonjak subsp. <i>orientalis</i>	Ch	IT	-	NE	5577, 5743
<i>Scorzonera laciniata</i> L.	He	IT, ES, M	-	NE	5563
<i>Scorzonera raddeana</i> C. Winkl.	Ge	IT	-	NE	6144
<i>Senecio glaucus</i> L.	Th	IT, ES, M, SS	-	NE	6237
<i>Senecio joharchii</i> F. Ghahreman., Ezazi, Rahchamani & Attar	He	IT	En	NE	6153
<i>Senecio paulsenii</i> O. Hoffm. In Paulsen subsp. <i>khorezanicus</i> (Rech. f. & Aell.) B. Nord	He	IT	-	NE	6140, 6192
<i>Serratula latifolia</i> Boiss.	He	IT	-	NE	6346, 6481
<i>Siebera nana</i> (DC.) Bornm.	Th	IT, M	-	NE	6452
<i>Sonchus oleaceus</i> L.	He	PL	-	NE	5784, 5804, 6190
<i>Tanacetum parthenium</i> (L.) Schultz-Bip.	He	PL	-	NE	5606, 5672
<i>Tanacetum polycephalum</i> subsp. <i>duderanum</i> (Boiss.)	He	IT	En	LR	6443

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
Podl.					
<i>Taraxacum montanum</i> (C. A. Mey.) DC.	He	IT, ES	-	NE	5754
<i>Tragopogon buphthalmoides</i> (DC.) Boiss. var. <i>buphthalmoides</i>	He	IT	-	NE	6062, 6145
<i>Tragopogon graminifolius</i> DC.	He	IT	-	NE	5641
<i>Tragopogon longirostris</i> Bisch. in Webb	He	IT, ES, M	-	NE	6207, 6292
<i>Tragopogon reticulatus</i> Boiss. & Huet in Boiss.	He	IT, ES	-	NE	6389
<i>Tripleurospermum disciforme</i> (C. A. Mey.) Schultz Bip.	Th	IT	-	NE	5661
<i>Tussilago farfara</i> L.	Ge	IT, ES, M	-	NE	5712, 5791, 6185
<i>Xanthium spinosum</i> L.	Th	COS	-	NE	5824
<i>Xeranthemum longipapposum</i> Fisch. & C. A. Mey.	Th	IT	-	NE	6341, 6453
Berberidaceae					
<i>Berberis integerrima</i> Bunge	Ph	IT	-	NE	5660, 5688, 5749, 5758, 6216, 6312
<i>Berberis integerrima</i> × <i>vulgaris</i>	Ph	-	-	-	5684
Boraginaceae					
<i>Anchusa italica</i> Retz. var. <i>italic</i>	Th	IT, ES	-	NE	5736, 6300, 6319
<i>Arnebia decumbens</i> (Vent.) Coss. & Kral.	Th	IT, SS	-	NE	5882
<i>Arnebia linearifolia</i> DC.	Th	IT	-	NE	6189
<i>Asperugo procumbens</i> L.	Th	IT, ES, M	-	NE	5901, 5974
<i>Buglossoides tenoiflora</i> (L. fil.) Johnston	Th	IT	-	NE	5953, 6049, 6126
<i>Caccinia macranthera</i> (Banks & Soland.) Brand in Engler var. <i>crassifolia</i> (Vent.) Brand in Engler	Th	IT	-	NE	5987, 6232
<i>Lappula ceratophora</i> (M. Pop.) M. Pop.	Th	IT	-	NE	5911, 6017, 6228
<i>Lappula drobovii</i> M. Pop. ex Pavl.	Th	IT	-	NE	5545, 6234
<i>Lappula microcarpa</i> (Ledeb.) Gurke in Engler & Prant.	Th	IT	-	NE	5658, 6061, 6138, 6303
<i>Lappula sessiliflora</i> (Boiss.) Gurke	Th	IT, ES	-	NE	6031, 6102
<i>Lappula sinaica</i> (DC.) Ascherson ex Schweinf.	Th	IT	-	NE	5651, 6362
<i>Lappula spinocarpus</i> (Forssk.) Ascherson & O. Kuntze	Th	IT, SS	-	NE	6337, 6354, 6472
<i>Myosotis ramosissima</i> Rochel ex Schultes	Th	IT, M	-	NE	6074
<i>Nonnea caspica</i> (Wiild.) G. Don	Th	IT	-	NE	5884, 5973, 6011, 6019
<i>Nonnea turcomanica</i> M. Pop.	Th	IT	-	NE	5883

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
<i>Onosma longilobum</i> Beg.	He	IT	-	NE	6151, 6156
<i>Paracaryum turcomanicum</i> Bornm. & Sint. ex Bornm.	He	IT	-	NE	5961, 6231
<i>Rindera lanata</i> (Lam.) Bge.	He	IT,ES	-	NE	6007, 6148
<i>Rochelia disperma</i> (L. f.) K. Koch	Th	IT	-	NE	6243
<i>Rochelia persica</i> Bunge ex Bioss.	Th	IT	-	NE	6233, 6361
<i>Solenanthus circinnatus</i> Ledeb.	He	IT	-	NE	6087, 6314
<i>Trichodesma incanum</i> (Bge.) DC.	He	IT	-	NE	5607
Brassicaceae					
<i>Aethionema carneum</i> (Banks & Soland.) B. Fedtsch.	Th	IT	-	NE	5548, 5567, 5585, 5910, 6025
<i>Aethionema trinervium</i> (DC.) Boiss.	Ch	IT	-	LR	6159
<i>Alyssum contemptum</i> Schott & Ky.	Th	IT	-	NE	5664, 5885, 5909
<i>Alyssum corningii</i> Dudley	He	IT	-	NE	6344, 6374
<i>Alyssum desertorum</i> Stapf.	Th	IT (M, ES)	-	NE	5574, 5880, 5893, 5921, 6036
<i>Alyssum inflatum</i> Nyarady	He	IT	-	NE	6432
<i>Alyssum linifolium</i> Steph. ex Willd. in L. var. <i>tehranicum</i> Bornm.	Th	IT, M	-	NE	5596, 5869, 5891, 5917, 6032
<i>Alyssum stapfii</i> Vierh.	Th	IT	-	NE	5920
<i>Alyssum turkestanicum</i> Regel & Schmalh. ex Regel	Th	IT	-	NE	5647, 6376, 6381
<i>Arabis nova</i> Vill.	Th	IT, ES, M	-	NE	6054
<i>Barbarea plantiginace</i> DC.	He	IT	-	NE	5994
<i>Capselle bursa-pastoris</i> (L.) Medicus	Th	COS	-	NE	5636, 5842
<i>Cardaria draba</i> (L.) Desv.	He	IT, M	-	NE	5617, 6044
<i>Chalcanthus renifolius</i> (Boiss. & Hohen.) Boiss.	Ge	IT	-	NE	6097
<i>Chorispora tenella</i> (Pall.) DC.	Th	IT	-	NE	5904
<i>Clausia turkestanica</i> Lipsky	He	IT	-	NE	6090, 6165, 6179
<i>Clypeola jonthlaspi</i> L.	Th	IT, M	-	NE	5668, 5894
<i>Conringia orientalis</i> (L.) Andrz. in DC.	Th	IT, M	-	NE	5670
<i>Conringia perfoliata</i> (C. A. Mey.) Busch in Komarov	Th	IT	-	NE	5859, 5952, 6390
<i>Conringia persica</i> Boiss.	Th	IT	-	NE	5608
<i>Crambe kotschyana</i> Boiss.	He	IT	-	NE	5875, 5978
<i>Descurainia sophia</i> (L.) Webb & Berth. in Engler & Prantl	Th	IT, ES, M	-	NE	5662
<i>Drabopsis verna</i> C. Koch.	Th	IT	-	NE	6166
<i>Euclidium syriacum</i> (L.) R. Br. in Aiton	Th	IT	-	NE	5665, 6575, 6129
<i>Euclidium tenuissimum</i> (Pall.) B. Fedtsch.	Th	IT	-	NE	6103
<i>Fibigia suffruticosa</i> (Vent.)	He	IT	-	NE	6387, 6412

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
Sweet					
<i>Goldbachia laevigata</i> (M. Bieb.) DC.	Th	IT, M	-	NE	6078, 6127
<i>Leptaleum filifolium</i> (Willd.) DC.	Th	IT (SS)	-	NE	6030, 6039
<i>Malcolmia africana</i> (L.) R. Br. in Aiton var. <i>Africana</i>	Th	IT, SS	-	NE	5650, 5879, 5903, 5935, 6401
<i>Matthiola alyssifolia</i> (DC.) Bornm. in Bornm. & Gauba	He	IT	-	NE	5988
<i>Matthiola farinosa</i> Bge. ex Boiss.	Ch	IT	-	NE	6149, 6158
<i>Pachytrygium brevipes</i> Bge.	Th	IT	-	NE	6393
<i>Peltaria turkmena</i> Lipsky	Th	IT	-	NE	6088, 6313
<i>Rapistrum rugosum</i> (L.) All.	Th	IT, ES, M	-	NE	6338
<i>Sisymbrium loeselii</i> L.	Th	IT, ES, M	-	NE	5839, 5993, 6055
<i>Sisymbrium septulatum</i> DC.	Th	IT, ES, M	-	NE	1512, 5655, 6056
<i>Stroganowia litwinowii</i> Lipsky	Th	IT	-	NE	6008, 6136, 6187, 6284, 6364, 6377, 6414
<i>Thlaspi perfoliatum</i> L.	Th	IT, ES, M	-	NE	5576, 5964
<i>Torularia contortuplicata</i> (Willd.) O. E. Schulz	Th	IT, ES	-	NE	5557, 5955, 6029, 6045
<i>Torularia torulosa</i> (Desf.) O. E. Schulz in Engler	Th	IT (SS)	-	NE	5945, 6331
Capparaceae					
<i>Capparis spinosa</i> L.	Ch	PL	-	NE	5730
<i>Cleome coluteoides</i> Boiss.	He	IT	-	NE	5609, 5872, 6021, 6385
Caprifoliaceae					
<i>Lonicera nummulariifolia</i> Jaub. & Spach	Ph	IT, M	-	NE	6391
Caryophyllaceae					
<i>Acanthophyllum glandulosum</i> Bunge ex Boiss.	Ch	IT	-	NE	5671, 6329, 6394
<i>Acanthophyllum gracile</i> Bunge ex Boiss.	Ch	IT	-	NE	5569
<i>Acanthophyllum sordidum</i> Bunge ex Boiss.	Ch	IT	-	NE	6330
<i>Cerastium inflatum</i> Link ex Desf.	Th	IT	-	NE	5959, 6392
<i>Dianthus crinitus</i> Sm. subsp. <i>turcomanicus</i> (Schischk.) Rech. F.	Ch	IT	-	NE	5582, 6455
<i>Dianthus orientalis</i> Adams in Weber & Mohr subsp. <i>stenocalyx</i> (Boiss.) Rech. F.	Ch	IT	En	NE	6352
<i>Gypsophila</i> sp.	He	-	-	-	6431
<i>Holosteum glutinosum</i> (M. B.) Fisch. & C. A. Mey.	Th	IT	-	NE	5873, 5943, 5979, 6034
<i>Lepyrodiclis holosteoides</i> (C. A. Mey.) Fenzl ex Fisch. & C. A. Mey.	Th	IT	-	NE	5635, 6124
<i>Lepyrodiclis stellarioides</i>	Th	IT	-	NE	5900, 6125

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
Schrenk ex Fisch. & C. A. Mey.					
<i>Mesostemma kotschyanum</i> (Fenzl) Vved. subsp. <i>afghanicum</i>	Th	IT	-	NE	6424
<i>Minuartia meyeri</i> (Boiss.) Bornm.	Th	IT	-	NE	5950, 6274
<i>Silene latifolia</i> Poir. subsp. <i>alba</i> (Miller) Greuter & Burdet	He	IT, ES, M	-	NE	5976, 6134, 6199
<i>Silene swertiifolia</i> Boiss.	He	IT	-	NE	6357, 6439
<i>Stellaria media</i> (L.) Vill.	Th	COS	-	NE	5899
Chenopodiaceae					
<i>Anthochlamys turcomanica</i> Iljin	Th	IT	-	LR	5666
<i>Ceratocarpus arenarius</i> L.	Th	IT, ES, M	-	NE	5614, 5739, 5812, 6487
<i>Chenopodium album</i> L. subsp. <i>album</i>	Th	COS	-	NE	5723, 5768, 5827
<i>Chenopodium album</i> L. subsp. <i>striatum</i>	Th	IT, ES, M	-	NE	5769
<i>Chenopodium botrys</i> L.	Th	PL	-	NE	5559, 5663
<i>Chenopodium foliosum</i> Aschers.	Th	PL	-	NE	6429, 6508
<i>Kochia scoparia</i> (L.) Schrad.	Th	PL	-	NE	5788
<i>Noaea mucronata</i> (Forssk.) Asch. & Schweinf. subsp. <i>mucronata</i>	Ch	IT	-	NE	5776, 5815, 5831
<i>Salsola incanescens</i> C. A. Mey.	Th	IT	-	NE	5826
<i>Salsola kali</i> L. subsp. <i>ruthenica</i> (Iljin) Soo	Th	PL	-	NE	5830
<i>Salsola orientalis</i> S. G. Gmel.	Ch	IT	-	NE	5816
<i>Spinacia turkestanica</i> Iljin	Th	IT	-	NE	6081, 6488
Convolvulaceae					
<i>Convolvulus arvensis</i> L.	Ge	COS	-	NE	5625, 5755, 5771
<i>Convolvulus lineatus</i> L.	He	IT	-	NE	6470
Cucurbitaceae					
<i>Bryonia aspera</i> Stev. ex Ledeb.	He	IT	-	NE	6184, 6407
Cuscutaceae					
<i>Cuscuta approximate</i> Babingt. var. <i>urceolata</i> (Kunze) Yunck.	Th	IT, M	-	NE	6261, 6348
<i>Cuscuta kotschyana</i> Boiss. var. <i>caudate</i> Bornm. & Schwarz	Th	IT	-	NE	6411
Dipsacaceae					
<i>Scabiosa olivieri</i> Coult	Th	IT, SS	-	NE	5554, 5583, 6351, 6480
<i>Scabiosa rotata</i> Bieb.	Th	IT	-	NE	6235, 6256
Elaeagnaceae					

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
<i>Elaeagnus angustifolia</i> L.	Ph	IT, M	-	NE	5631, 5764
Euphorbiaceae					
<i>Chrozophora hierosolymitana</i> Spreng.	Th	IT, SS	-	NE	5746, 6496
<i>Euphorbia aelleni</i> Rech. f.	He	IT	En	DD	5742, 6316, 6489
<i>Euphorbia aucheri</i> Boiss.	He	IT	-	NE	5998, 6001, 6200, 6405, 6491
<i>Euphorbia buhsei</i> Boiss.	He	IT	-	NE	5597, 5874, 6006, 6363
<i>Euphorbia bungei</i> Boiss.	He	IT	-	NE	5897, 6004, 6060, 6229
<i>Euphorbia szovitsii</i> Fisch. & Mey.	Th	IT, ES	-	NE	6147, 6210, 6347
Fabaceae					
<i>Alhagi pseudoalhagi</i> (M. B.) Desv.	He	IT	-	NE	5544, 5738, 5828
<i>Astragalus angustiflorus</i> C. Koch subsp. <i>angustiflorus</i>	He	IT	-	NE	5986, 6123
<i>Astragalus basineri</i> Trautv.	He	IT	-	NE	6388, 6421
<i>Astragalus campylanthoides</i> Bornm.	He	IT, M	En	NE	5876, 5888
<i>Astragalus campylorrhynchus</i> F. & M.	Th	IT, SS	-	NE	6213, 6221, 6225
<i>Astragalus citrinus</i> Bunge subsp. <i>citrinus</i>	He	IT	-	NE	6160
<i>Astragalus curvipes</i> Trautv.	He	IT	-	NE	5602, 5708, 5854, 5871, 5934
<i>Astragalus eremophilus</i> Boiss. subsp. <i>eremophilus</i>	Th	SS	-	NE	6224, 6417, 6451
<i>Astragalus gompholobium</i> Benth. ex Bunge	He	IT	-	NE	5855
<i>Astragalus iranicus</i> Bunge	He	IT	-	DD	6246
<i>Astragalus masanderanus</i> Bunge	He	IT	-	LR	6155, 6379
<i>Astragalus mercklinii</i> Boiss. & Buhse	He	IT	-	NE	5954
<i>Astragalus meschedensis</i> (Bunge) Podl.	Ch	IT	En	NE	5547, 5687
<i>Astragalus neo-assadianus</i> Ranjbar & Karamiyan	He	IT	En	NE	6441
<i>Astragalus nephtonensis</i> Freyn	He	IT	-	LR	6403
<i>Astragalus ochreatus</i> Bunge	He	IT	En	NE	6010
<i>Astragalus olangensis</i> Maassoumi	He	IT	-	NE	5937
<i>Astragalus pellitus</i> Bunge	He	IT	En	NE	6162
<i>Astragalus podolobus</i> Boiss. & Hohen.	Ch	IT	-	NE	6043
<i>Astragalus rawlinsianus</i> Aitch. & Baker	He	IT	-	NE	6106
<i>Astragalus ruscifolius</i> Boiss.	He	IT	En	NE	5912, 5980
<i>Astragalus schahrudensis</i> Bunge	He	IT	-	LR	6227, 6353
<i>Astragalus sieversianus</i> Pall.	He	IT	-	LR	5991, 6201

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
<i>Astragalus stalinskyi</i> Sirjaev	Th	IT	-	NE	6026
<i>Astragalus suluklensis</i> Freyn et Sint	He	IT, M	-	NE	6368
<i>Astragalus sumbarii</i> Popov	He	IT	-	NE	6120
<i>Astragalus tribuloides</i> Del.	Th	IT, SS	-	NE	6024
<i>Astragalus weirianus</i> Aitch. & Baker	He	IT	-	NE	6238
<i>Astragalus zoshkensis</i> F. Ghahremaninejad	He	IT	En	NE	6142
<i>Astragalus</i> sp.	He	-	-	-	6157
<i>Colutea buhsei</i> (Boiss.) Shap.	Ph	IT, ES	-	NE	5685, 5701, 5846
<i>Glycyrrhiza glabra</i> L. var. <i>glandulifera</i> (Waldst. & Kit) Boiss.	He	IT, M	-	LR	5748, 5832
<i>Hedysarum wrightianum</i> Aitch. & Baker	He	IT	-	NE	6239, 6244
<i>Lathyrus inconspicuus</i> L.	Th	IT, M	-	NE	5948
<i>Lens orientalis</i> (Boiss.) Hand.-Mazz.	He	IT	-	NE	5946, 6048, 6249
<i>Lotus corniculatus</i> L. subsp. <i>corniculatus</i> var. <i>hirsutus</i> W. D. J. Koch	He	PL	-	NE	5632, 5719, 5785, 5799
<i>Medicago lupulina</i> L.	He	COS	-	NE	5905, 6047
<i>Medicago radiata</i> (L.) Boiss.	Th	IT	-	NE	6251
<i>Medicago sativa</i> L.	He	IT	-	NE	5618
<i>Melilotus officinalis</i> (L.) Pall.	He	IT, ES, M	-	NE	5623
<i>Meristotropis xanthioides</i> Vassilcz.	Ge	IT	-	NE	5730
<i>Onobrychis cornata</i> (L.) Desv. subsp. <i>cornuta</i>	Ch	IT	-	NE	6080
<i>Onobrychis heliocarpa</i> Boiss.	Th	IT	En	DD	6241
<i>Onobrychis micrantha</i> Schrenk & C. A. Mey.	Th	IT	-	NE	6262
<i>Onobrychis</i> sp.	Ch	-	-	-	6141, 6154
<i>Onobrychis</i> sp.	Ch	-	-	-	6434
<i>Oxytropis</i> sp.	Ch	-	-	-	6022, 6371
<i>Sophora pachycarpa</i> C. A. Mey.	He	IT	-	NE	5561, 5620, 5772, 6336
<i>Trifolium fragiferum</i> L. var. <i>pulchellum</i> Lange	He	IT, ES, M	-	NE	5787
<i>Trifolium pretense</i> L. var. <i>pretense</i>	He	IT, ES, M	-	NE	5648, 5818
<i>Trifolium repens</i> L. subsp. <i>repens</i>	He	IT, ES, M	-	NE	5637, 5817
<i>Trigonella monantha</i> C. A. Meyer subsp. <i>noeana</i> (Boiss.) Huber.-Morath	Th	IT	-	NE	5657, 6050, 6250
<i>Trigonella</i> sp.	Ch	-	-	-	6433
<i>Vicia ervilia</i> (L.) Willd.	Th	IT	-	NE	5603, 6223
<i>Vicia iranica</i> Boiss.	He	IT	-	NE	5856, 5892, 5916, 5969, 5982, 6041
<i>Vicia michauxii</i> L. var. <i>stenophylla</i> Boiss.	Th	IT	-	NE	6211

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
<i>Vicia monantha</i> Retz.	Th	IT, M	-	NE	5851
<i>Vicia peregrina</i> L.	Th	IT, ES, M	-	NE	5947, 5957
<i>Vicia subvillosa</i> (Ledeb.) Boiss.	Ge	IT	-	NE	5915
<i>Vicia venulosa</i> Boiss. & Hohen.	He	IT	-	NE	5968, 5977, 6358, 6442, 6447
Fumariaceae					
<i>Corydalis aitchisonii</i> M. Pop.	Ge	IT	-	NE	6172
<i>Corydalis chionophila</i> Czerniak.	Ge	IT	-	LR	5983
<i>Fumaria asepala</i> Boiss.	Th	IT, M	-	NE	5956, 6020, 6222
<i>Fumaria vaillantii</i> Loisel.	Th	IT, ES, M	-	LR	6016
Geraniaceae					
<i>Bieberstiana multifida</i> DC.	Ge	IT	-	NE	5984
<i>Erodium cicutarium</i> (L.) L'Her. ex Aiton	Th	IT, ES, M	-	NE	5552, 5600, 5924
<i>Geranium kotschyi</i> Boiss.	Ge	IT	-	NE	5870, 5958, 6063, 6118
<i>Geranium rotundifolium</i> L.	Th	IT, ES, M	-	NE	6197
Hypericaceae					
<i>Hypericum helianthemoides</i> (Spach) Boiss.	He	IT	-	NE	6415, 6490, 6501
<i>Hypericum scabrum</i> L.	He	IT	-	NE	6306, 6408, 6419
Juglandaceae					
<i>Juglans regia</i> L.	Ph	IT, ES	-	NE	6513
Lamiaceae					
<i>Acinos graveolens</i> (M. B.) Link.	Th	IT, M	-	NE	6305, 6497
<i>Eremostachys labiosa</i> Bunge	He	IT	-	NE	6038, 6206
<i>Eremostachys labiosiformis</i> (M. Pop.) Knorring	He	IT	-	NE	6131
<i>Eremostachys regeliana</i> Aitch. & Hemsl.	He	IT	-	NE	6003
<i>Hymenocrater elegans</i> Bunge	Ch	IT	-	NE	6422
<i>Hymenocrater platystegius</i> Rech. f.	Ch	IT	En	LR	6404
<i>Lagochilus aucheri</i> Boiss.	Ch	IT	En	NE	6383, 6473
<i>Lallemantia royleana</i> (Benth. in Wall.) Benth. in DC.	Th	IT	-	NE	6015
<i>Lamium amplexicaule</i> L. var. <i>amplexicaule</i>	Th	COS	-	NE	5652, 5881, 6311
<i>Marrubium anisodon</i> C. Koch	He	IT	-	NE	5538, 5640, 5725, 6287
<i>Marrubium duabense</i> Murata	He	IT	-	NE	6397
<i>Marrubium vulgare</i> L.	He	PL	-	NE	6507
<i>Mentha longifolia</i> (L.) Hudson. var. <i>asiatica</i>	He	PL	-	LR	5639, 5718, 6286

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
(Boriss.) Rech. f.					
<i>Nepeta pungens</i> (Bunge) Benth.	Th	IT	-	NE	6423
<i>Nepeta sacchorata</i> Bunge	Th	IT	-	NE	6448
<i>Perovskia abrotanoides</i> Karel.	Ch	IT	-	NE	5540, 5691
<i>Phlomis cancellata</i> Bunge	He	IT	-	NE	5539, 5564, 6398
<i>Salvia hypoleuca</i> Benth.	He	IT	En	LR	6195, 6370
<i>Salvia macrosiphon</i> Boiss.	He	IT	-	NE	6248
<i>Salvia nemorosa</i> L.	He	IT, ES	-	NE	6335
<i>Salvia sclerea</i> L.	He	IT, M	-	NE	6322, 6399
<i>Stachys lavandulifolia</i> Vahl	Ch	IT	-	NE	6113, 6139
<i>Stachys setifera</i> C. A. Mey. subsp. <i>iranica</i> (Rech. f.) Rech. f.	Ge	IT	-	NE	5793, 5802, 6310
<i>Stachys spectabilis</i> Choisy ex DC.	He	IT	-	NE	5717
<i>Stachys trinervis</i> Aitch. & Hemsl.	Ch	IT	-	NE	5861, 5932, 6012
<i>Teucrium polium</i> L. var. <i>tonsum</i> Stapf	Ch	IT, M	-	NE	5565, 5595
<i>Ziziphora clinopodioides</i> Lam. Subsp. <i>szowitsii</i> (Rech. f.) Rech. f.	Ch	IT	-	NE	6325
<i>Ziziphora tenuior</i> L.	Th	IT	-	NE	5599, 6033, 6253
Linaceae					
<i>Linum glaucum</i> Boiss. & Noe	He	IT	-	NE	6058, 6133
Malvaceae					
<i>Alcea rhyticarpa</i> (Trautv.) Iljan var. <i>rhyticarpa</i>	He	IT	-	NE	6333, 6457
<i>Malva neglecta</i> Wallr.	He	IT, ES, M	-	NE	5757, 5808
Moraceae					
<i>Ficus carica</i> L.	Ph	IT, M	-	NE	5621, 5778, 6456
<i>Morus alba</i> L.	Ph	IT	-	NE	5777
Onagraceae					
<i>Epilobium hirsutum</i> L.	Ge	PL	-	NE	6502
<i>Epilobium minutiflorum</i> Hausskn.	He	PL	-	NE	5673, 6278
<i>Epilobium tetragonum</i> L.	Ge	IT	-	NE	5790, 5803
Orobanchaceae					
<i>Orobanch ceruna</i> Lofl.	Ge	IT, M, SS	-	NE	6458
Papaveraceae					
<i>Glaucium elegans</i> Fisch. & C. A. Mey.	Th	IT	-	NE	5593
<i>Hypecoum pendulum</i> L. var. <i>pendulum</i>	Th	IT, M	-	NE	5624, 5886, 5927, 5970
<i>Papaver dubium</i> L.	Th	IT, SS	-	NE	6191, 6217, 6512
<i>Papaver pavoninum</i> Fesch. & C. A. Mey.	Th	IT	-	NE	5933
<i>Roemeria hybrida</i> (L.) DC. subsp. <i>dodecandra</i> (Forssk.) Maire	Th	IT, ES, M	-	NE	5645, 5928, 6479

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
<i>Roemeria reflacta</i> DC.	Th	IT	-	NE	5653, 6205, 6478
Plantaginaceae					
<i>Plantago lanceolata</i> L.	He	IT, ES, M	-	NE	5638, 5677, 5774
<i>Plantago major</i> L.	He	COS	-	NE	6484
Platanaceae					
<i>Platanus orientalis</i> L.	Ph	IT, M	-	NE	5763
Plumbaginaceae					
<i>Acantholimon erinaceum</i> (Jaub. & Spach) Lincz.	Ch	IT	-	NE	5566, 6494
<i>Acantholimon karelini</i> (Stschegl.) Bge.	Ch	IT	-	NE	5579, 6474
<i>Acantholimon raddeanum</i> Czernjak	Ch	IT	-	NE	6276
Podophyllaceae					
<i>Bongardia chrysogonum</i> (L.) Spach	Ge	IT	-	NE	5853, 5862, 5936, 6071
Polygonaceae					
<i>Polygonum afghanicum</i> Meisn.	Ch	IT	-	NE	6027, 6506
<i>Polygonum hyrcanicum</i> Rech. f.	He	IT, ES	En	LR	5674, 5720, 5780, 5789, 5797, 5809, 5814, 5819, 5825, 6505
<i>Polygonum paronychioides</i> C. A. Mey. ex Hohen.	He	IT	-	NE	5575
<i>Pteropyrum aucheri</i> Jaub. & Spach	Ch	IT	-	NE	5578, 5598, 5753
<i>Rumex caucasicum</i> Rech. f.	He	IT	-	NE	5667, 6466
<i>Rumex pulcher</i> L. subsp. <i>divaricatus</i> (L.) Murb.	He	IT, M	-	NE	5616, 5702, 6289
Portulacaceae					
<i>Portulaca oleracea</i> L.	Th	IT, ES, M	-	NE	5770
Primulaceae					
<i>Androsace maxima</i> L.	Th	IT, ES, M	-	NE	5572, 5878, 5918, 5923, 6013
<i>Glaux maritima</i> L.	Ge	PL	-	NE	6464
Punicaceae					
<i>Punica granatum</i> L.	Ph	IT, ES	-	NE	5629, 6485
Ranunculaceae					
<i>Adonis annua</i> L. subsp. <i>cupaniana</i> (Guss.) C. Steinb.	Th	IT, M	-	DD	5907, 5929, 6064, 6161
<i>Anemone petiolulosa</i> Juz.	He	IT	-	NE	6005
<i>Ceratocephalus falcata</i> (L.) Pers.	Th	IT, ES, M	-	NE	5887, 5914, 5926, 5971
<i>Clematis orientale</i> L.	Ch	IT	-	NE	5690, 5710, 5761, 5837
<i>Consolida orientalis</i> (Gay) Schrod.	Th	IT, M	-	NE	5643, 6128
<i>Consolida rugulosa</i> (Boiss.) Schrod. forma <i>rugulosa</i>	Th	IT	-	NE	6252

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
<i>Delphinium turkmenum</i> Lipsky	Th	IT	-	NE	6381, 6477
<i>Ficaria kochii</i> (Ledeb.) Iranshahr & Rech. f.	Ge	IT	-	NE	6168
<i>Nigella integrifolia</i> Regel	Th	IT	-	NE	6132, 6146, 6198
<i>Ranunculus afghanicus</i> Aitch. & Hemsl.	Ge	IT	-	NE	6167, 6170, 6180
<i>Ranunculus arvensis</i> L.	Th	IT	-	NE	5642, 6067
<i>Ranunculus</i> sp.	Ge	-	-	-	6174
<i>Thalictrum isupyroides</i> C. A. Mey. in Ledeb.	Ge	IT	-	NE	6002
<i>Thalictrum sultanabadense</i> Stapf	He	IT	-	NE	5966, 6075
Resedaceae					
<i>Reseda lutea</i> L.	He	IT, ES, M	-	NE	5622, 6018
Rhamnaceae					
<i>Rhamnus Pallasii</i> Fisch. & C. A. Mey. subsp. <i>sintenisii</i> (Rech. f.) Browicz & J. Zielinski	Ph	IT, ES	-	LR	5706
<i>Ziziphus jujuba</i> Miller	Ph	ES	-	NE	5644
Rosaceae					
<i>Amygdalus communis</i> L.	Ph	IT	-	NE	5630
<i>Amygdalus spinosissima</i> Bge. subsp. <i>turcomanica</i> (Lincz.) Browicz	Ph	IT	-	NE	5562, 5779, 5857, 5867
<i>Armeniaca vulgaris</i> Lam.	Ph	IT, ES	-	NE	5627
<i>Cerasus chorassanica</i> Pojark.	Ph	IT	En	LR	5963, 6181
<i>Cerasus microcarpa</i> (C.A.Mey.) Boiss. subsp. <i>microcarpa</i>	Ph	IT	-	NE	6085, 6093
<i>Cerasus turcomanica</i> Pojark.	Ph	IT	-	DD	5760, 5997
<i>Cerasus vulgaris</i> Miller	Ph	IT, ES	-	NE	5628
<i>Cotoneaster assadii</i> Khatamsaz	Ph	ES	En	VU	5836
<i>Cotoneaster discolor</i> Pojark.	Ph	IT, ES	-	NE	5759
<i>Cotoneaster hissaricus</i> Pojark.	Ph	IT	-	NE	5845
<i>Cotoneaster nummularioides</i> Pojark.	Ph	IT	-	NE	5698, 6410, 6440, 6445
<i>Cotoneaster ovatus</i> Pojark.	Ph	IT	-	NE	5834
<i>Geum kokanicum</i> Regel. & Schmalh. ex Regel	He	IT	-	NE	6099, 6171
<i>Malus orientalis</i> Ugl.	Ph	IT, ES	-	NE	5633
<i>Persica vulgaris</i> Miller	Ph	PL	-	NE	5634
<i>Rosa beggeriana</i> Schrenk in Fisch. & Mey.	Ph	IT	-	NE	5549, 5686, 5765, 5792, 6444
<i>Rosa persica</i> Michx. ex Juss.	Ge	IT	-	NE	5558, 5877
<i>Sanguisorba minor</i> Scop. subsp. <i>laciocarpa</i> (Boiss. & Hausskn.) Nordborg	He	IT, ES, M	-	NE	5732, 5745, 6260, 6449

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
Rubiaceae					
<i>Asperula arvensis</i> L.	Th	IT	-	NE	6426
<i>Asperula glomerata</i> (Bieb.) Griseb. subsp. <i>afghanica</i> Ehrend. & Schonb.-Tem.	Ch	IT	-	NE	6459
<i>Callipeltis cucullaria</i> (L.) DC.	Th	IT, M	-	NE	5676, 6273
<i>Crucianella gilanica</i> Trin. subsp. <i>transcapica</i> (Ehrend.) Ehrend. & Schonb.-Tem.	He	IT	-	NE	5737, 6373
<i>Cruciata taurica</i> (Pall. ex Willd.) Ehrend. subsp. <i>Persica</i> (DC.) Ehrend.	Ch	IT	-	NE	5939, 6109
<i>Galium aparine</i> L.	Th	PL	-	NE	5975, 6068
<i>Galium humifusum</i> M. B.	He	IT, M	-	NE	5722, 6112, 6270
<i>Galium spurium</i> L. subsp. <i>spurium</i>	Th	IT, ES, M	-	NE	6366
<i>Galium cf. verticillatum</i> Danth. ex Lam.	Th	IT, M	-	NE	6428
<i>Galium sp.</i>	Th	-	-	-	6277
<i>Galium sp.</i>	He	-	-	-	6467
<i>Rubia florida</i> Boiss.	Ch	IT	-	LR	5940, 5992
Rutaceae					
<i>Haplophyllum acutifolium</i> (DC.) G. Don	He	IT	-	NE	6196, 6342
Salicaceae					
<i>Populus nigra</i> L. subsp. <i>caudina</i> (Ten.) Bug.	Ph	IT, ES, M	-	DD	5716, 6482
<i>Salix acmophylla</i> Boiss.	Ph	IT, M	-	NE	6137
<i>Salix babylonica</i> L.	Ph	COS	-	NE	5693
<i>Salix excelsa</i> S. G. Gmelin var. <i>rodinii</i> A. Skvortsov	Ph	IT	-	NE	5762, 6215
Santalaceae					
<i>Thesium kotschyanum</i> Boiss.	Ge	IT	-	NE	6153, 6375
Scrophulariaceae					
<i>Leptorhabdos parviflora</i> (Benth.) Benth.	Th	IT	-	NE	6495
<i>Linaria kavirensis</i> Hamdi & Assadi	Th	IT	En	NE	6468
<i>Linaria simplex</i> (Willd.) DC. in lam. & DC.	Th	IT, M	-	NE	5902
<i>Scrophularia striata</i> Boiss.	Ch	IT	-	NE	5573, 5756, 6291
<i>Scrophularia variegata</i> M. B. subsp. <i>variegata</i>	Ch	IT	-	NE	5801
<i>Verbascum cheiranthifolium</i> Boiss. var. <i>transcaspicum</i> Murb.	He	IT	-	NE	5682, 5734, 5833
<i>Veronica anagallis-aquatica</i> L. subsp. <i>lysimachioides</i> (Boiss.) M. A. Fischer	Th	IT	-	NE	5669
<i>Veronica anagallis-aquatica</i> L. subsp. <i>oxycarpa</i> (Boiss. in	Ge	IT	-	NE	6498

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
Kotschy) A. Jelen.					
<i>Veronica campylopoda</i> Boiss.	Th	IT	-	NE	5679, 5841, 6104
<i>Veronica capillipes</i> Nevski	Th	IT	-	NE	6349
<i>Veronica czerniakowskiana</i> Monjuschko	He	IT	-	NE	6100
<i>Veronica rubrifolia</i> Boiss. subsp. <i>respectatissima</i> M. A. Fischer	Th	IT	-	LR	5838, 5868, 5962, 6046
<i>Veronica siaretensis</i> Lehm.	Th	ES	-	NE	5906
Solanaceae					
<i>Hyoscyamus kurdicus</i> Bornm.	Th/He	IT	-	NE	5896, 6186
<i>Hyoscyamus pusillus</i> L.	Th	IT	-	NE	6079
<i>Hyoscyamus squarrosus</i> Griff.	He	IT	-	NE	5649
<i>Hyoscyamus turcomanica</i> Pojark.	He	IT	-	NE	6135, 6332
<i>Lycium kopetdaghi</i> Pojark	Ph	IT	-	NE	5601
<i>Solanum nigrum</i> L.	Th	COS	-	NE	5823
Tamaricaceae					
<i>Tamarix ramosissima</i> Ledeb.	Ph	PL	-	NE	5543, 5613, 5646, 5659, 5747
Ulmaceae					
<i>Ulmus minor</i> Mill.	Ph	ES, M	-	NE	6509
Urticaceae					
<i>Parietaria judaica</i> L.	Ch	IT, ES, M	-	NE	6183
<i>Urtica dioica</i> L. subsp. <i>dioica</i>	He	COS	-	NE	6182
Valerianaceae					
<i>Valeriana ficariifolia</i> Boiss.	He	IT	-	NE	5965, 6101, 6285
<i>Valeriana sisymbriifolia</i> Vahl.	He	IT	-	NE	6096
<i>Valerianella cymbicarpa</i> C. A. Mey.	Th	IT	-	NE	5556, 6236
<i>Valerianella leiocarpa</i> (Stev.) Betcke	Th	IT	-	NE	6014, 6035
<i>Valerianella plagiostephana</i> Fisch. & C. A. Mey.	Th	IT, ES	-	NE	5995, 6053
Violaceae					
<i>Viola occulta</i> Lehm.	Th	IT	-	NE	5604, 6382, 6416
Zygophyllaceae					
<i>Peganum harmala</i> L. var. <i>harmala</i>	He	IT, ES, M	-	NE	5542, 5726, 5835
<i>Zygophyllum atriplicoides</i> Fisch. & C. A. Mey.	Ch	IT	-	NE	6009, 6023
Angiospermae: Monocotyledonae					
Alliaceae					
<i>Allium cristophii</i> Trautv.	Ge	IT	-	NE	6418
<i>Allium kopetdaghense</i> Vved.	Ge	IT	-	NE	6378, 6400

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
<i>Allium kuhsorkhense</i> R. M. Fritsch & M. Joharchi	Ge	IT	En	NE	6110, 6152, 6164
<i>Allium longicuspis</i> Regel	Ge	IT	-	NE	6301
<i>Allium rubellum</i> M. Bieb. IT Ge	Ge	IT	-	NE	5895, 6076, 6226
<i>Allium scabriscapum</i> Boiss. & kotschy	Ge	IT	-	NE	5581, 6350, 6454
<i>Allium xiphopetalum</i> Aitch. & Baker	Ge	IT	-	NE	6380
Araceae					
<i>Arum kotschyi</i> Boiss. & Hohen. ex Boiss.	Ge	IT, M	-	NE	6084, 6395
Colchicaceae					
<i>Colchicum kotschyi</i> Boiss.	Ge	IT	-	NE	5844
<i>Colchicum persicum</i> Baker	Ge	IT	-	NE	6066
Cyperaceae					
<i>Carex distans</i> L.	Ge	IT, ES, M	-	NE	5711, 6469, 6500
<i>Carex divisa</i> Huds.	Ge	IT, ES, M	-	NE	6178, 6355
Iridaceae					
<i>Gladiolus atroviolaceus</i> Boiss.	Ge	IT, M	-	NE	6121, 6321
<i>Iris fosteriana</i> Aitch. & Baker	Ge	IT	-	NE	5865
<i>Iris kopetdaghensis</i> (Vved.) Mathew & Wendelbo	Ge	IT	-	NE	5960, 6042, 6111, 6150
<i>Iris songarica</i> Schrenk in Fisch. & Mey.	Ge	IT	-	NE	6037
Ixioliriaceae					
<i>Ixiolirion tataricum</i> (Pall.) Herb.	Ge	IT	-	NE	6052, 6254, 6471
Juncaceae					
<i>Juncus articulatus</i> L.	He	COS	-	NE	5695, 5798
<i>Juncus inflexus</i> L.	He	PL	-	NE	5610, 5735, 5783, 5820, 6503
Juncaginaceae					
<i>Triglochin palustris</i> L.	He	PL	-	NE	5843
Liliaceae					
<i>Bellevalia saviczii</i> Woron.	Ge	IT	-	NE	5858, 5863, 5913
<i>Eremurus luteus</i> Baker	Ge	IT	-	NE	6028
<i>Fritillaria gibbosa</i> Boiss.	Ge	IT	-	NE	5866
<i>Gagea chomutowae</i> Pascher	Ge	IT	-	NE	5989
<i>Gagea dschangoria</i> Regel	Ge	IT	-	NE	6117
<i>Gagea fistulosa</i> Ker-Gawl.	Ge	IT, ES, M	-	NE	6173, 6177
<i>Gagea gageoides</i> (Zucc.) Vved.	Ge	IT	-	NE	5967, 6089, 6092
<i>Gagea olga</i> Regel	Ge	IT	-	NE	5972
<i>Gagea reticulata</i> (Pall.) Schultes & Schultes fil.	Ge	IT, SS	-	NE	5890, 6176, 6208
<i>Gagea stipitata</i> Merckl. ex Bunge	Ge	IT	-	NE	5852

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
<i>Hyacinthus litwinowii</i> Czerniak.	Ge	IT	-	LR	6000, 6082, 6169, 6175
<i>Muscari neglectum</i> Guss. in Ten.	Ge	IT, ES, M	-	NE	5850, 5990, 5999, 6115
<i>Polygonatum sewerzowii</i> Regel	Ge	IT	-	NE	6091, 6298
<i>Tulipa biflora</i> Call.	Ge	IT, ES	-	NE	5985, 6095, 6116
<i>Tulipa micheliana</i> Hoog	Ge	IT	-	NE	5942, 6114, 6163
<i>Tulipa montana</i> Lindl. var. <i>montana</i>	Ge	IT	En	NE	5860, 5864, 5941
Orchidaceae					
<i>Orchis paluster</i> Jacq.	Ge	IT, ES, M	-	NE	6462
Poaceae					
<i>Aegilops crassa</i> Boiss. var. <i>macranthera</i> Boiss.	Th	IT	-	NE	6343
<i>Aegilops juvenalis</i> (Thell.) Eig	Th	IT	-	DD	5773
<i>Aegilops kotschyi</i> Boiss. var. <i>hirta</i> Eig.	Th	IT	-	NE	5553
<i>Aeluropus pungens</i> (M. B.) C. Koch	Th	IT, M	-	NE	5822
<i>Agropyron elongatiflorum</i> (Host) P. Beauv.	Ge	IT, ES	-	NE	5592
<i>Agropyron intermedium</i> (Host.) P. Beauv.	Ge	IT, ES	-	NE	6268, 6384, 6475
<i>Agropyron trichophorum</i> (Link) Richter	Ge	ES, M	-	NE	6296
<i>Alopecurus arundinaceus</i> Poir. var. <i>arundinaceus</i>	He	IT, ES, M	-	NE	6069, 6188, 6214
<i>Avena eriantha</i> Durieu in Duchartre	Th	IT, M	-	NE	6365
<i>Boissiera squarrosa</i> (Banks & Soland.) Nevski	Th	IT	-	NE	5571, 6328, 6345, 6492, 6499
<i>Bothriochlea ischaemum</i> (L.) Keng	He	PL	-	NE	5721
<i>Bromus danthoniae</i> Trin. var. <i>lanuginosus</i> Roshev.	Th	IT	-	NE	5591, 6218, 6259, 6271, 6294
<i>Bromus rubens</i> L. var. <i>rubens</i>	Th	IT, M	-	NE	6202, 6220
<i>Bromus tectorum</i> L. var. <i>hirsutus</i> Regel	Th	IT, ES, M	-	NE	5587, 5938
<i>Bromus tomentellus</i> Boiss.	He	IT	-	NE	6308
<i>Calamagrostis dubia</i> Bge.	Ge	IT	-	NE	6288, 6360
<i>Calamagrostis pseudophragmites</i> (Hall. f.) Koel.	He	PL	-	NE	5715, 6290
<i>Catapodium rigidum</i> (L.) C. E. Hubb.	Th	IT, ES, M	-	NE	5729
<i>Cynodon dactylon</i> (L.) Pers.	He	PL	-	NE	5594
<i>Dactylis glomerata</i> L. var. <i>hispanica</i> (Roth) Nyman	He	PL	-	NE	6279, 6295, 6299
<i>Echinochloa crus-galli</i> (L.) P. Beauv. var. <i>submutica</i> Neilr.	Th	IT, ES, M	-	NE	5813
<i>Eremopoa persica</i> (Trin.)Roshev. var.	Th	IT, M	-	NE	6425, 6461, 6476

Name of family and taxa	Life form	Chorotype	Endemism	IUCN status	Voucher specimen
<i>songarica</i> (Schrenk) Bor.					
<i>Eremopyrum bonaepartis</i> (Spreng.) Nevski var. <i>bonaepartis</i>	Th	IT	-	NE	6094
<i>Eremopyrum bonaepartis</i> (Spreng.) Nevski var. <i>sublanuginosum</i> (Drobov.) Melderis	Th	IT	-	NE	5590
<i>Festuca sp.</i>	He	-	-	-	6320
<i>Heterantherium piliferum</i> (Banks. & Soland.) Hochst.	Th	IT, SS	-	NE	5680, 6219
<i>Hordeum brevisubulatum</i> Link	He	IT	-	NE	6281, 6463
<i>Hordeum bulbosum</i> L.	He	IT, M	-	NE	6267, 6283, 6318
<i>Hordeum glaucum</i> Steud.	Th	IT, M	-	NE	5752
<i>Hordeum spontaneum</i> C. Koch.	Th	PL	-	NE	6465
<i>Leucopoa sclerophylla</i> (Boiss. & Hohen.) V. Krecz. & Bobrov	He	IT	-	NE	6304
<i>Lolium rigidum</i> Gaudin	Th	IT, ES, M	-	NE	5889
<i>Melica jacquemontii</i> Decne. ex Jacquem. subsp. <i>canescens</i> (Regel) Bor	He	IT	-	NE	6293, 6302
<i>Melica persica</i> Kunth. subsp. <i>persica</i>	He	IT	-	NE	5568, 5588
<i>Nardurus subulatus</i> (Banks & Soland.) Bor	Th	IT	-	NE	5908, 5925, 5949
<i>Phragmites australis</i> (Cav.) Trin. ex Steud. var. <i>australis</i>	He	COS	-	NE	5692, 5786, 5794, 5840
<i>Poa bulbosa</i> L.	He	IT, ES, M	-	NE	5898, 5922, 5944, 6073
<i>Poa sinaica</i> steud.	He	IT	-	NE	6409, 6430
<i>Polypogon fugax</i> Nees ex Steud.	Th	PL	-	NE	5750, 5829
<i>Setaria glauca</i> (L.) P. Beauv.	Th	IT, SS	-	NE	5696, 5821
<i>Stipa barbata</i> Desf.	He	IT	-	NE	5580, 6258
<i>Taeniatherum asperum</i> (Simonkai) Nevski	Th	IT, M	-	NE	5550, 5586, 6070, 6072, 6402
<i>Vulpia persica</i> (Boiss. & Buhse) V. Krecz. & Bobrov	Th	IT	-	NE	6203, 6209, 6255
Typhaceae					
<i>Typha grossheimii</i> Pobed.	He	IT	-	NE	5805

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Appendix 2. Picture of plants.



a. *Calendula officinalis* L., **b.** *Centaurea depressa* M. Bieb., **c.** *Cousinia microcarpa* Boiss., **d.** *Jurinea monocephala* Aitch. & Hemsl. subsp. *sintenisii* (Bornm.) Wagenitz, **e.** *Pulicaria dysenterica* (L.) Bernh., **f.** *Tragopogon reticulatus* Boiss. & Huet in Boiss., **g.** *Anchusa italica* Retz. var. *italica*, **h.** *Nonnea caspica* (Willd.) G. Don, **i.** *Malcolmia africana* (L.) R. Br. in Aiton var. *africana*



a. *Lonicera nummulariifolia* Jaub. & Spach, **b.** *Convolvulus arvensis* L., **c.** *Astragalus schahrudensis* Bunge, **d.** *Geranium kotschyi* Boiss., **e.** *Eremostachys labiosiformis* (M. Pop.) Knorring, **f.** *Linum glaucum* Boiss. & Noe, **g.** *Alcea rhyticarpa* (Trautv.) Iljan var. *rhyticarpa*, **h.** *Papaver dubium* L., **i.** *Ranunculus afghanicus* Aitch. & Hemsl.



a. *Cerasus turcomanica* Pojark., **b.** *Rosa beggeriana* Schrenk in Fisch. & Mey., **c.** *Rosa persica* Michx. ex Juss., **d.** *Allium kopetdaghense* Vved., **e.** *Arum kotschyi* Boiss. & Hohen. ex Boiss., **f.** *Colchicum kotschyi* Boiss., **g.** *Gladiolus atroviolaceus* Boiss., **h.** *Iris fosteriana* Aitch. & Baker, **i.** *Iris kopetdaghensis* (Vved.) Mathew & Wendelbo



a. *Ixiolirion tataricum* (Pall.) Herb., **b.** *Fritillaria gibbosa* Boiss., **c.** *Tulipa montana* Lindl. var. *Montana*, **d.** *Tulipa biflora* Call., **e.** *Tulipa micheliana* Hoog, **f.** *Orchis paluster* Jacq., **g.** *Alopecurus arundinaceus* Poir. var. *arundinaceus*, **h.** *Equisetum ramosissimum* Desf., **i.** *Juniperus excelsa* M. B.

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