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The Endemic and Rare Non-Endemic Plants of Kirişli Mountain (Isparta-Turkey)

Bedrettin SELVİ[1]* Şinasi YILDIRIMLI[2]

[1] Art & Science Faculty, Department of Biology, Gaziosmanpasa University, Tokat Turkey
[2] Faculty, Department of Biology, Hacettepe University, Ankara, Turkey
*: e-mail: bselvister@gmail.com

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Abstract: 3627 specimens were collected during 20 scientific field trips to Kirişli mountain (Isparta). By evaluation of these specimens, 114 families, 505 genera, 1113 species, 30 subspecies and 9 varieties (1152 taxa) were determined. 1046 of these taxa are natural and 67 cultivated. Number of endemic species are 150 (14.34%). Phytogeographical regions of these endemic species that were determined in the research area are Irano-Turanian (64 species), Mediterranean (34 species). The distribution of the threat categories of these endemic species are as follows: 5 species CR, 2 species EN, 7 species VU, 23 species NT and 113 species LC. The threat categories of rare non-endemic species are as follows: 2 species CR and 1 species VU. *Alcea pisidica* Hub.-Mor. and *Dumaniana gelendostensis* Yıld. & B.Selvi are previously known from the type collection, and gathered again from the same locality. CR, EN, VU and DD categories of species are discussed.

Keywords: Endemism, Kirişli Mountain, Isparta, Turkey

Kirişli Dağı (Isparta)'nın endemik ve nadir bitkileri

Özet: Kirişli dağına (Isparta) gerçekleştirilen 20 bilimsel gezi ile 3627 bitki örneği toplanmış ve bunların değerlendirilmesi sonucu 114 familya, 505 cins, 1113 tür, 30 alttür ve 9 varyete, toplamda 1152 takson tespit edilmiştir. 1113 türün 1046 'sı doğal 67'si kültürdür. Araştırma alanından toplanan 1045 doğal türden 150 tanesi Türkiye için endemik olup endemizm oranı % 14.34'dür. Bu endemik türlerin 64'ü İran-Turan, 34'si Akdeniz (27'i Doğu Akdeniz, 6'sı Doğu Akdeniz Dağ, 1'i Akdeniz) bitki coğrafyası bölgesi endemiğidir. Bu endemik türlerin tehlike kategorileri dağılımı sırasıyla:. CR kategorisinde 5 tür, EN kategorisinde 2 tür, VU kategorisinde 7 tür, LC kategorisinde 113 tür ve NT kategorisinde 23 tür bulunmaktadır. Endemik olmayan nadir bitkilerden ise CR kategorisinde 2, VU kategorisinde 1 tür bulunmaktadır. *Alcea pisidica* Hub.-Mor. and *Dumaniana gelendostensis* Yıld. & B.Selvi önceden bilinen tip lokalitelerinden tekrar toplanmıştır. Bu türlerden CR, EN, VU ve DD kategorisinde bulunan endemik ve endemik olmayan nadir türlerinin tehlike kategorileri tartışılmıştır.

Keywords: Endemizm, Kirişli Dağı, Isparta, Türkiye

1. Introduction

Two parts of Turkey are included in Conservation International's 25 world ''biodiversity hotspots''. Southern and a small part of Northeastern Anatolia are included in the "Mediterranean Basin'' and "Caucasus'' hotspots, respectively. Turkey is also included in 4 Global 200 Ecoregions, including "Caucasus-Anatolian-hyrcanian Temperate Forests'' (WWF & IUCN, 1994). The damage caused by humans to the environment is gradually increasing with industrial and economic development. Preservation and rehabilitation studies of various natural environments have lately been increasing in popularity. It is necessary to determine the biological richness of an environment to succeed in such research.

To know which taxa or genetic resources are in danger or under threat of extinction will contribute greatly to the prevention of their

irreparable loss. The flora of Turkey's being interesting lies in its having rich variety of species it includes. The rate of endemism in our country is % 34 (Ekim, 2005).

Kirişli Mountain is located in the eastern part of Isparta province in the northern part of the Kirişli, which is situated in the Irano-Turanian phytogeographic region (Davis et al., 1971). The main part of the study area is located in B3 according to the grid system adopted in the Flora of Turkey (Davis, 1965-1985). The altitude of the area is between 925 m at Lake Hoyran and 1900 m at the summit of Kirişli Mountain.

2. Material and Methods

Endemic and rare non-endemic plant specimens belonging to various families have been collected as a result of floristic studies held in between 2011 and 2004 in Kirişli mountain. These material have been dried. These specimens were identified basically by using the Flora of Turkey (Davis, 1965-1985; Davis et al., 1988; Güner et al., 2000). Threat categories are proposed for some endemic and rare non-endemic taxa according to IUCN risk (IUCN, 2001). Taxa in DD and CR are discussed in result and discussion according to Red Data Book of Turkish Plants of (Ekim et al., 2000). The abbreviations used in the text and the endemic list are as follows: Ir.-Tur.: Irano-Turanian; Medit: Mediterranean; E. Medit.: East Mediterranean; E. Medit. (mt.): East Mediterranean (mountain); El.: Element; CR: Critically endangered; EN: Endangered; VU: Vulnerable; LC: Least concern; NT: Near threatened; DD: Data deficient.

3. Result and Discussion

A summary of the numerical data is presented in Table 1. in the study area, The number of endemic species are 150 and the endemism rate 14.34%, which is below the average in Turkey (34%) (Ekim, 2005). The reason to this in our opinion, is that it is hard for especially the endemic species to grow in settlement areas where they are disturbed by people as a result which makes it impossible for them to stay alive. Another reason is under the effects of grazing.The endemic species in the study area is grown on Kirişli Mountain. Based on IUCN risk, 153 taxa (all endemics, and 3 rare non-endemics) were evaluated according to IUCN risk categories (IUCN, 2001). The results are summarised in Table 2. The distribution of the threat categories of these species are as follows: 5 species CR, 2 species EN, 6 species VU, 113 species LC and 22 species NT. The taxa in the CR and EN risk categories are given in Table 2.

Table 1. *Number and rates of endemic and non-endemic species of Kirişli Mountain*

Total endemic species	150	14.34 %
Non-endemic species	896	85.76 %
Total natural species	1046	100.00 %

Table 2. *The distribution of IUCN Red List categories of endemic and non-endemic species of Kirişli Mountain (Isparta).*

Threaten Categories	Endemic	Non-Endemic
CR	5	2
EN	2	-
VU	6	1
LC	113	-
NT	22	-
Total	150	3

Phytogeographical regions of these endemic and non-endemic species that were determined in the research area are Irano-Turanian (64), Mediterranean (34) respectively (Table 3 and Table 4). Threat categories of some species (CR, EN, VU and LC) are discussed.

Table 3. *IUCN Red List categories of endemic species of Kirişli Mountain (Isparta) and phytogeographic regions*

	Family	**Phytogeographic El.**
CR		
Dumaniana gelendostensis Yıldırımlı & Selvi	*Apiaceae*	E. Medit.(mt)
Centaurea anthemifolia Hub.-Mor.	*Asteraceae*	
Isatis glauca Aucher ex Boiss. subsp. *galatica* Yıldırımlı	*Brassicaceae*	
Alcea pisidica Hub.-Mor.	*Malvaceae*	E. Medit.(mt)
Rubia davisiana Ehrend.	*Rubiaceae*	
EN		
Clypeola ciliata Boiss.	*Brassicaceae*	
Verbascum leptocladum Boiss. & Heldr.	*Scrophulariaceae*	E. Medit.
VU		
Hesperis balansae Fourn. subsp. *mytilensis* Dvořák	*Brassicaceae*	E. Medit.
Bolanthus spergulifolius (Jaub. & Spach) Hub.-Mor.	*Caryophyllaceae*	
Onobrychis argyrea Boiss. subsp. *isaurica* Hedge & Hub.-Mor.	*Fabaceae*	E. Medit.
Geranium lasiopus Boiss. & Heldr.	*Geraniaceae*	Ir.-Tur.
Rosa dumalis Bechst subsp. *boissieri* (Crepin) Ö. Nilsson var. *antalyensis* (Manden.) Ö. Nilsson	*Rosaceae*	
Verbascum symes Murb. & Rech.	*Scrophulariaceae*	E. Medit.
LC		
Acanthus hirsutus Boiss.	*Acanthaceae*	
Prangos meliocarpoides Boiss. var. *meliocarpoides*	*Apiaceae*	Ir.-Tur.
Bupleurum sulphureum Boiss. & Bal.	*Apiaceae*	Ir.-Tur.
Ferulago macrosciadia Boiss. & Bal.	*Apiaceae*	E. Medit.
Heracleum platytaenium Boiss.	*Apiaceae*	
Helichrysum arenarium (L.) Moench subsp. *aucheri* (Boiss.) Davis & Kupicha	*Asteraceae*	Ir.-Tur.
Anthemis wiedemanniana Fish. & Mey.	*Asteraceae*	
Achillea kotschyi Boiss. subsp. *canescens* Basler	*Asteraceae*	E. Medit.
Achillea cappadocica Hausskn. & Bormn.	*Asteraceae*	Ir.-Tur.
Tanacetum argenteum (Lam.)Willd. subsp. *argenteum*	*Asteraceae*	
Tripleurospermum callosum (Boiss. & Heldr.) E. Hossain	*Asteraceae*	
Ptilostemon afer (Jacq.) Greuter subsp. *eburneus* Greuter	*Asteraceae*	Ir.-Tur.
Jurinea pontica Hausskn. & Freyn ex Hausskn.	*Asteraceae*	
Centaurea cariensis Boiss. subsp. *longipapposa* Wagenitz	*Asteraceae*	E. Medit.
Centaurea reuterana Boiss. var. *phrygia* Bornm.	*Asteraceae*	E. Medit.
Scorzonera eriophora DC.	*Asteraceae*	
Scorzonera tomentosa L.	*Asteraceae*	Ir.-Tur.
Hieracium lasiochaetum (Bornm. & Zahn) Sell & West	*Asteraceae*	
Crepis macropus Boiss. & Heldr.	*Asteraceae*	Ir.-Tur.
Rochelia disperma (L. fil.) C. Koch var. *microcalycina* (Bornm.) Edmondson	*Boraginaceae*	Ir.-Tur.

Moltkia aurea Boiss.	*Boraginaceae*	Ir.-Tur.
Onosma bracteosa Hausskn. & Bornm	*Boraginaceae*	Ir.-Tur.
Onosma isauricum Boiss. & Heldr.	*Boraginaceae*	
Cynoglottis chetikiana Vural & Kit Tan subsp. *paphlagonica* (Hausskn. ex Bornm.)	*Boraginaceae*	
Alkanna areolata Boiss. var. *areolata*	*Boraginaceae*	E. Medit.
Isatis floribunda Boiss. ex Bornm.	*Brassicaceae*	Ir.-Tur.
Alyssum praecox Boiss. & Bal. var. Praecox	*Brassicaceae*	
Alyssum pateri Nyar subsp. *Pateri*	*Brassicaceae*	Ir.-Tur.
Arabis aubrietioides Boiss.	*Brassicaceae*	
Aubrieta canescens (Boiss.) Bornm. subsp. *canescens*	*Brassicaceae*	
Aubrieta pinardii Boiss.	*Brassicaceae*	Ir.-Tur.
Erysimum kotschyanum Gay	*Brassicaceae*	
Camelina hispida Boiss. var. *grandiflora* (Boiss.) Hedge	*Brassicaceae*	
Campanula lyrata Lam. subsp. *lyrata*	*Campanulaceae*	
Campanula argaea Boiss. & Bal.	*Campanulaceae*	Ir.-Tur.
Asyneuma limonifolium (L.) Janchen	*Campanulaceae*	
subsp. *pestalozzae* (Boiss.) Damboldt	*Campanulaceae*	
Asyneuma virgatum (Labill.) Bornm.	*Campanulaceae*	E. Medit.(mt)
subsp. *cichoriforme* (Boiss.) Damboldt		
Arenaria acerosa Boiss.	*Caryophyllaceae*	
Minuartia umbellulifera (Boiss.) Mcneill subsp. *umbellulifera* var. *umbellulifera*	*Caryophyllaceae*	
Minuartia leucocephala (Boiss.) Mattf.	*Caryophyllaceae*	
Minuartia anatolica (Boiss.) Woron. var. *arachnoidea* Mcneill	*Caryophyllaceae*	Ir.-Tur.
Minuartia leucocephaloides (Bornm.) Bornm.	*Caryophyllaceae*	
Dianthus anatolicus Boiss.	*Caryophyllaceae*	
Gypsophila sphaerocephala Fenzl. ex Tchihat var. *cappadocica* Boiss.	*Caryophyllaceae*	Ir.-Tur.
Gypsophila eriocalyx Boiss.	*Caryophyllaceae*	Ir.-Tur.
Bolanthus minuartioides (Jaub. & Spach) Hub.-Mor.	*Caryophyllaceae*	
Saponaria prostrata Willd. subsp. *prostrata*	*Caryophyllaceae*	Ir.-Tur.
Convolvulus galaticus Rostan ex Choisy	*Convolvulaceae*	Ir.-Tur.
Rosularia sempervivum (M. Bieb.) subsp. *glaucophylla* A. Berger	*Crassulaceae*	E. Medit.
Rosularia chrysantha (Boiss.) Tahkt.	*Crassulaceae*	E. Medit.
Scabiosa reuteriana Boiss.	*Dipsacaceae*	E. Medit.
Pterocephalus pinardii Boiss.	*Dipsacaceae*	E. Medit.
Euphorbia falcata L. subsp. *macrostegia* (Bornm.) O. Schwarz	*Euphorbiaceae*	E. Medit.
Euphorbia anacampseros Boiss. var. *anacampseros*	*Euphorbiaceae*	
Genista involucrata Spach	*Fabaceae*	Ir.-Tur.
Astragalus acicularis Bunge	*Fabaceae*	Ir.-Tur.
Astragalus tmoleus Boiss. var. *bounacanthus* (Boiss.) Chamberlain	*Fabaceae*	
Astragalus lydius Boiss.	*Fabaceae*	Ir.-Tur.
Astragalus mesogitanus Boiss.	*Fabaceae*	
Astragalus amoenus Fenzl	*Fabaceae*	
Astragalus gymnolobus Fischer	*Fabaceae*	Ir.-Tur.
Trifolium pannonicum Jacq. subsp. *elongatom* (Willd.) Zoh.	*Fabaceae*	

Hedysarum pestalozzae Boiss.	*Fabaceae*	Ir.-Tur.
Onobrychis fallax Freyn & Sint.	*Fabaceae*	Ir.-Tur.
Onobrychis armena Boiss. & Huet.	*Fabaceae*	
Onobrychis tournefortii (Willd.) Desv.	*Fabaceae*	
Erodium amanum Boiss. & Kotschy	*Geraniaceae*	
Hypericum lanuginosum Lam. var. *scabrellum* (Boiss.) Robson	*Hypericaceae*	E. Medit.
Hypericum aviculariifolium Jaub. & Spach subsp. *aviculariifolium* var. *aviculariifolium*	*Hypericaceae*	E. Medit.
Crocus danfordiae Maw	*Iridaceae*	
Juncus sparganiifolius Boiss. & Kotschy ex Buchenau	*Juncaceae*	E. Medit.
Phlomis armeniaca Willd.	*Lamiaceae*	Ir.-Tur.
Phlomis nissolii L.	*Lamiaceae*	Ir.-Tur.
Wiedemannia orientalis Fich. & Mey.	*Lamiaceae*	Ir.-Tur.
Ballota nigra L. subsp. *anatolica* P. H. Davis	*Lamiaceae*	Ir.-Tur.
Marrubium rotundifolium Boiss.	*Lamiaceae*	E. Medit.(mt)
Sideritis libanotica Labill. subsp. *linearis* (Bentham) Bornm.	*Lamiaceae*	E. Medit.(mt)
Stachys cretica L. subsp. *anatolica* Rech. Fil.	*Lamiaceae*	Ir.-Tur.
Stachys setifera C. A. Meyer subsp. *lycia* (Gand.) Bhattcharjee	*Lamiaceae*	Ir.-Tur.
Nepeta cadmea Boiss.	*Lamiaceae*	E. Medit.
Origanum sipyleum L.	*Lamiaceae*	E. Medit.
Thymus zygioides Griseb. var. *lycaonicus* (Celak.) Ronniger	*Lamiaceae*	E. Medit.
Thymus sipyleus Boiss. subsp. *sipyleus* var. *sipyleus*	*Lamiaceae*	
Salvia cadmica Boiss.	*Lamiaceae*	
Salvia hypargeia Fisch. & Mey.	*Lamiaceae*	Ir.-Tur.
Salvia cryptantha Montbret & Aucher ex Bentham	*Lamiaceae*	Ir.-Tur.
Salvia cyanescens Boiss. & Bal.	*Lamiaceae*	Ir.-Tur.
Hyacinthella heldreichii (Boiss.) Chouard	*Liliaceae*	E. Medit.
Tulipa armena Boiss. var. *lycica* (Baker) Marais	*Liliaceae*	
Linum cariense Boiss.	*Linaceae*	Ir.-Tur.
Linum hirsutum L. subsp. *anatolicum* (Boiss.) Hayek var. *anatolicum*	*Linaceae*	Ir.-Tur.
Alcea apterocarpa (Fenzl) Boiss.	*Malvaceae*	Ir.-Tur.
Fumana paphlagonica Bornm.& Janchen	*Papaveraceae*	Ir.-Tur.
Elymus panormitanus (Parl.) Tzvelev	*Poaceae*	Ir.-Tur.
Amblyopyrum muticum (Boiss.) Eig var. *loliaceum* (Jaub. & Spach) Eig	*Poaceae*	
Puccinellia koeieana Melderis subsp. *anatolica* Kit Tan	*Poaceae*	
*Consolida stenocarpa (*Davis & Hossain) Davis	*Ranunculaceae*	Ir.-Tur.
Consolida raveyi (Boiss.) Schrod.	*Ranunculaceae*	Ir.-Tur.
Rhamnus thymifolius Bornm.	*Rhamnaceae*	
Asperula stricta Boiss. subsp. *latibracteata* (Boiss.) Ehrend.	*Rubiaceae*	Ir.-Tur.
Galium dumosum Boiss.	*Rubiaceae*	
Haplophyllum myrtifolium Boiss.	*Rutaceae*	Ir.-Tur.
Verbascum caudatum Freyn & Bornm.	*Scrophulariaceae*	Ir.-Tur.
Verbascum pycnostachyum Boiss. & Heldr.	*Scrophulariaceae*	E. Medit.
Verbascum insulare Boiss. & Heldr.	*Scrophulariaceae*	Ir.-Tur.
Scrophularia libanotica Boiss. subsp. *libanotica*	*Scrophulariaceae*	Ir.-Tur.

Boiss. var. *australis* R. Mill		
Linaria genistifolia (L.) Miller subsp. *confertiflora* (Boiss.) Davis	*Scrophulariaceae*	Ir.-Tur.
Linaria corifolia Desf.	*Scrophulariaceae*	Ir.-Tur.
Linaria iconia Boiss. & Heldr.	*Scrophulariaceae*	Ir.-Tur.
Veronica cuneifolia D. Don subsp. *cuneifolia*	*Scrophulariaceae*	
Veronica orientalis Miller subsp. *nimrodi* (Richter ex Stapf) M.A. Fischer	*Scrophulariaceae*	
Veronica multifida L.	*Scrophulariaceae*	Ir.-Tur.
Lycium anatolicum A. Baytop & R. Mill	*Solanaceae*	Ir.-Tur.
Valerianella glomerata Boiss. & Bal.	*Valerianaceae*	Ir.-Tur.
NT		
Bupleurum turcicum Snogerup	*Apiaceae*	Ir.-Tur.
Tripleurospermum kotschyi (Boiss.) E. Hossain	*Asteraceae*	
Cousinia iconica Hub.-Mor.	*Asteraceae*	
Carduus nutans L. subsp. *trojanus* P. H. Davis	*Asteraceae*	
Onosma lycaonicum Hub.-Mor.	*Boraginaceae*	Ir.-Tur.
Alkanna incana Boiss.	*Boraginaceae*	E. Medit.
Alyssum huber-morathii Dudley	*Brassicaceae*	E. Medit.
Aubrieta anamasica Peşmen & Güner	*Brassicaceae*	E. Medit.
Asyneuma compactum (Boiss. & Heldr.) Damboldt	*Campanulaceae*	E. Medit.(mt)
Gypsophila arrostii Guss. var. *nebulosa* (Boiss. & Heldr.) Bark.	*Caryophyllaceae*	Ir.-Tur.
Astragalus stereocalyx Bornm.	*Fabaceae*	Ir.-Tur.
Onobrychis pisidica Boiss.	*Fabaceae*	Ir.-Tur.
Quercus vulcanica [Boiss. & Heldr. ex] Kotschy	*Fagaceae*	E. Medit.(mt)
Paronychia argyroloba Stapf	*Illecebraceae*	
Lamium pisidicum R. Mill	*Lamiaceae*	
Micromeria cristata (Hampe) Griseb. subsp. *xylorrhiza* (Boiss. & Heldr.) Davis	*Lamiaceae*	E. Medit.
Thymus longicaulis C. Presl subsp. *chaubardii* (Boiss. & Heldr. Ex Reichb. Fil.) Jalas var. *antalyanus* (Klokov) Jalas	*Lamiaceae*	
Ornithogalum alpigenum Stapf	*Liliaceae*	E. Medit.(mt)
Hyacinthus orientalis L. subsp. *chinophilus* Weldelbo	*Liliaceae*	Ir.-Tur
Fritillaria fleischeriana Steudel & Hochst. ex Schultes & Schultes fil.	*Liliaceae*	Ir.-Tur.
Papaver virchowii Aschers. & Sint.	*Papaveraceae*	
Ranunculus heterorhizus Boiss. & Bal.	*Ranunculaceae*	
Veronica elmaliensis L. A. Fischer	*Scrophulariaceae*	E. Medit.

Table 4. *IUCN Red List categories of non-endemic species of Kirişli Mountain (Isparta) and phytogeographic regions*

	Family	**Phytogeographic El.**
CR		
Micromeria cristata (Hampe) Griseb. subsp. *cristata*	*Caryophyllaceae*	E. Medit.
Parietaria officinalis L.	*Urticaceae*	
VU		
Salvinia natans L.	*Salviniaceae*	

Dumaniana gelendostensis Yıld. & Selvi is (CR). This taxon is registered from only Kirişli mountain (Güner et al., 2012). It was found in a small and narrow locality near Saklı Hill and the population is poor.

Isatis glauca Aucher ex Boiss. subsp. ***galatica*** *Yıld*. is (CR). It was found in Kirişli mountain. From the current research area, it was found in a small and narrow locality near Saklı Hill and the population is poor.

Rubia davisiana Ehrend. is (CR). This taxon is registered on *Quercus coccifera* from only Kirişli mountain. It was found in a small and narrow locality and the population is poor. The population is under the effects of grazing.

Alcea pisidica Hub.-Mor. (*Malvaceae*) was categorised as endangered (EN) according to Red Data Book of Turkish Plants (Güner et al., 2000) and IUCN Red List Categories and Criteria, version 3.1 (IUCN, 2001). According to the Flora of Turkey, it was registered from Gelendost (Isparta) province and was gathered from only one locality in the current research area. The population was local farmers, under the effects of grazing and geographically limited. For these reasons it is categorised as CR.

Centaurea anthemifolia Hub.-Mor. is (CR). This taxon was gathered from only a locality in the research area, it was found in a narrow locality and the population is poor.

Clypeola ciliata Boiss. is EN. It was found in Yumru hill. From the current research area, it was found in a small and narrow locality near Saklı Hill and the population is poor. The population is under the effects of grazing.

Verbascum leptocladum Boiss. & Heldr. is EN. It was found on rocky places in Yenice hill. From the current research area, it was found in a small and narrow locality near Saklı Hill and the population is poor.

Geranium lasiopus Boiss. & Heldr. is VU. Its populations were registered from different regions and localities and it is widely distributed.

Bolanthus spergulifolius (Jaub. & Spach) Hub.-Mor. is VU. This taxon was gathered from only a locality in the research area, it was found in a narrow locality and the population is poor.

Rosa dumalis Bechst subsp. **boissieri** (Crepin) Ö. Nilsson ***var.*** **antalyensis** (Manden.) Ö. Nilsson is VU. This taxon was gathered from only a locality in the research area, it was found in a narrow locality and the population is poor.

Verbascum symes Murb. & Rech. is VU. This taxon was gathered from only a locality in the research area, it was found in a narrow locality and the population is poor.

Hesperis balansae Fourn. subsp. **mytilensis** Dvořák is VU. This taxon was gathered from only a locality in the research area, it was found in a narrow locality and the population is poor.

Salvinia natans L. (*Salviniaceae*) was categorised as endangered (EN) according to Red Data Book of Turkish Plants (Ekim et al., 2000) and IUCN Red List Categories and Criteria, version 3.1 (IUCN, 2001). According to the Flora of Turkey, It is non-endemic species. Its populations were registered from Hoyran Lake and it is widely distributed. This reason it is categorised as VU.

Parietaria officinalis L. was categorised as DD according to Red Data Book of Turkish Plants (Güner et al., 2000) and IUCN Red List Categories and Criteria, version 3.1 (IUCN, 2001). It was registered from Hoyran Lake. It was found only on rocky places in Yenice hill, in a small and narrow locality and the population is poor. The population is under the effects of grazing. This reason it is categorised as CR.

Micromeria cristata (Hampe) Griseb. subsp. **cristata** was categorised as endangered (DD) according to Red Data Book of Turkish Plants (Güner et al., 2000) and IUCN Red List Categories and Criteria, version 3.1 (IUCN, 2001). According to the Flora of Turkey, It is non-endemic taxon. It was registered from Kirişli mountain. Its populations were registered from Kirişli mountain and it is widely distributed. This reason it is categorised as VU.

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