Botanica SERBICA 33 (2): 147-155 (2009)

Original Scientific Paper

Endemic plants of Başarakavak and environs (Konya, Turkey)

Evren Yildiztugay*, Yavuz Bağci and Mustafa Küçüködük

Department of Biology, Faculty of Sciences, Selçuk University, Campus, 42075, Selçuklu, Konya, Turkey

ABSTRACT: As a result of floristic investigation of the region among Başarakavak town, Tatköy and Altınapa Dam within Konya city borders carried out between 2004 and 2006, 691 taxa belonging to 90 families and 370 genera were recorded. The number of endemic taxa within the study area is 100 (14.5%). Within the endemic flora, the largest families are *Leguminosae* (15), *Labiatae* (14), and *Compositae* (12) in terms of the number of species and subspecies included. Genus represented by the highest number of endemic taxa is *Astragalus* (13). The distribution of phytogeographic elements of the endemic flora is 59% for Irano-Turanian, 15% for Mediterranean, 1% for Euro-Siberian, and 25% for others (widespread or unknown). In addition, for all the endemic taxa, IUCN (2001) threatened category was defined. As a result of this, two endemic species are in Endangered (EN) category, while ten endemic plants are concidered to be vulnerable (VU).

Key words: Flora, Endemic, Başarakavak, Tatköy, Altınapa Dam, Konya, Turkey

Received 08 September 2009 Revision accepted 18 December 2009

UDK 581.9(560)

INTRODUCTION

The research area is a region among Başarakavak town, Tatköy and Altınapa Dam within Konya city borders and in the northwest of the city centre through the C4 square according to Grid System (Fig. 1). This area was selected for the research because it was not thoroughly studied and has some interesting characteristics, in terms of both flora and phytogeography. The research area has a semiarid Mediterranean climate. According to Emberger the precipitation-temperature coefficient (Q) is 32.8 (Akman 1990). Annual mean temperature is 11.4 °C. The maximum mean temperature (M) is 17.8 ˚C. The minimum mean temperature (m) is 5.1 °C. Annual rainfall is about 320.9 mm (MGM 2006), and the seasonal precipitation regime is winter, spring, autumn, and summer. The ombrothermic diagram shows dry and rainy months (Fig. 2). The most abundant soil types in the area were red-brown soil, red-chestnut soil, brown without lime soil, without lime brown forest soil, alluvial soil (Konya Kapali Havzasi Topraklari 1978).

Research area has steppe vegetation and these species belong to genus *Astragalus* L., *Hedysarum* L., *Salvia* L., *Dianthus* L. and *Thymus* L.

The present paper is part of MSci degree of the first author called *"The Flora of Region among Başarakavak, Tatköy and Altınapa Dam (Konya)"*.

MATERIALS AND METHODS

During fieldwork conducted between 2004 and 2006, 1222 plant specimens were collected and identified in the study area. The collected plant specimens were dried according to herbarium techniques, numbered and deposited in KNYA Herbarium Collection. For the identification of the specimens The Flora of Turkey (Davis 1965-1985; Davis et al. 1988; Güner *et al.* 2000) and other floras and references (Tutin *et al.* 1964-1980) were used. In addition, phytogeographic elements as well as threat categories for the endemic taxa are defined according to Ekim *et al.* (2000) and IUCN (2001).

*correspondence: eytugay@selcuk.edu.tr

© 2009 Institute of Botany and Botanical Garden Jevremovac, Belgrade

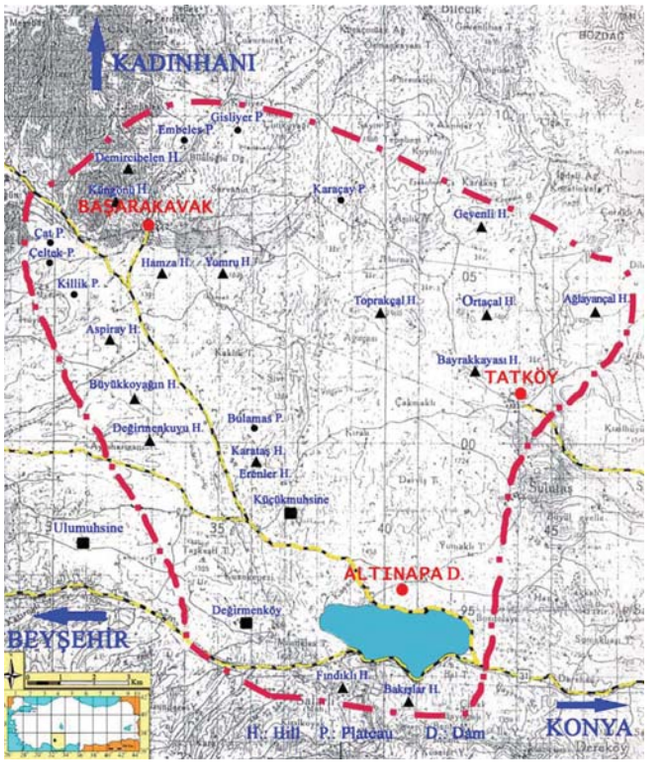

Fig. 1. Map of the studied area.

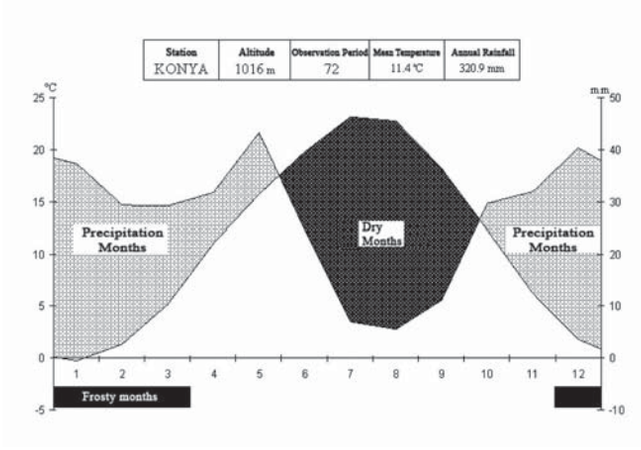

Fig. 2. Ombrothermic diagram of Konya, Turkey.

RESULTS AND DISCUSSION

In the investigated area, 691 taxa belonging to 90 families and 370 genera were recorded. The number of endemic taxa is 100 and the endemism rate is 14.5%, which is below the average in Turkey (34%) (Ekim 2005).

Threat categories of the endemic taxa are evaluated according to IUCN 2001. Threat categories number of these taxa: LC (Least Concern): 77, NT (Near Threatned): 6, VU (Vulnerable): 10, EN (Endangered): 2, Unknown: 5. As a result of this *Clypeola ciliata* Boiss. and *Silene lycaonica* Chowdh. are in Endangered (EN) categories; *Dianthus ancyrensis* Hausskn. & Bornm., *Astragalus suberosus* Banks & Sol. subsp. *ancyleus* (Boiss.) Maththews, *Centaurea bourgaei* Boiss., *Onosma sieheanum* Hayek, *Veronica macrostachya* Vahl. subsp. *sorgerae* M.A.Fisch., *Sideritis brevibracteata* P.H.Davis, *Thesium bertramii* Aznav. and *Iris stenophylla* Hausskn. & Siehe ex Baker subsp. *stenophylla* are in Vulnerable (VU) category.

Distribution of the species according to floristic region was as follows: Irano-Turanian elements ranked first, accounting for 59% of the specimens, followed by Mediterranean elements (15%) and Euro-Siberian elements (only 1%). The phytogeographic region of 25% of the identified taxa remains widespread or unknown (Tab. 1).

The six richest families in terms of number of endemic taxa are shown in Tab. 2, while the genera with the largest number of endemic taxa in the study area are presented in Tab. 3.

In the present study, the genus *Astragalus* had the highest number of endemic taxa. As the estimated number of taxa belonging to *Astragalus* in Turkey is 400, one would expect to find a higher number of taxa. This might be the result of the suitable ecological factors and habitat for taxa in the genus *Astragalus* within the study area. Most taxa in *Astragalus* are known as steppic plants of Irano-Turanian phytogeographical regions (Ünal & Behcet 2007).

The data of the present study was compared to the results from other floristic studies in East Anatolia, close to The Flora of Region among Başarakavak, Tatköy and Altınapa Dam (Konya) (Tab. 4). The present study was focused on a specific group (endemic plants only), while previous studies were generally based on floristic investigations of all vascular plants in the region.

The Irano-Turanian elements seem to be dominant in all areas studied, while the Mediterranean elements come in second in all these areas, except The Flora of Region among Bozkır-Çumra Apa Dam and Hadim (Konya) (Tugay 2003) and The Flora of Yeşildağ-Kurucuova (Beyşehir) (Serin & Çetik 1984). The dominance of the Irano-Turanian elements in the flora of region Başarakavak and environs is expected because the study area lies in the Irano-Turanian region.

Finally, 4 species were defined for C4 Konya as new records for the investigated area throughout this study according to Grid System (Donner 2007). These are as follows: *Clypeola ciliata* Boiss., *Centaurea bourgaei* Boiss., *Cephalaria paphlagonica* Bobrov, *Colchicum baytopiorum* C. D. Brickell.

Table 1. List of endemic plants

Families	Taxa	Threat Categories	Phytogeographic element
Acanthaceae	*Acanthus hirsutus* Boiss.	LC	Irano-Turanian
Boraginaceae	*Alkanna pseudotinctoria* Hausskn. ex Hub.-Mor.	LC	Irano-Turanian
	Anchusa leptophylla Roem. & Schult. subsp. *incana* (Ledeb.) Chamb.	LC	Irano-Turanian
	Moltkia aurea Boiss.	LC	Irano-Turanian
	Nonea macrosperma Boiss. & Heldr.	LC	Irano-Turanian
	Onosma isauricum Boiss. & Heldr.	LC	Irano-Turanian
	Onosma lycaonicum Hub.-Mor.	NT	Irano-Turanian
	Onosma sieheanum Hayek	VU	Irano-Turanian
	Paracaryum longipes Boiss.	NT	Irano-Turanian
Campanulaceae	*Asyneuma limonifolium* (L.) Janch. subsp. *pestalozzae* (Boiss.) Damboldt	LC	Unknown
	Asyneuma linifolium (Boiss. & Heldr.) Bornm. subsp. *linifolium*	LC	Mediterranean
	Campanula lyrata Lam. subsp. *lyrata*	LC	Unknown
Caryophyllaceae	*Arenaria ledebouriana* Fenzl. var. *ledebouriana*	LC	Unknown
	Dianthus ancyrensis Hausskn. & Bornm.	VU	Irano-Turanian
	Minuartia anatolica (Boiss.) Woron. var. *arachnoidea* McNeill	LC	Irano-Turanian
	Silene lycaonica Chowdh.	EN	Irano-Turanian
Cistaceae	*Helianthemum nummularium* (L.) Mill. subsp. *lycaonicum* Coode & Cullen	LC	Unknown
Compositae	*Achillea aleppica* DC. subsp. *zederbaueri* (Hayek) Hub.-Mor.	LC	Irano-Turanian
	Centaurea bourgaei Boiss.	VU	Mediterranean
	Centaurea cariensis Boiss. subsp. *longipapposa* Wagenitz	LC	Mediterranean
	Centaurea inexpectata Wagenitz	LC	Euro-Siberian
	Centaurea pichleri Boiss. subsp. *extrarosularis* (Hayek & Siehe) Wagenitz	LC	Unknown
	Cousinia iconica Hub.-Mor.	LC	Irano-Turanian
	Crepis macropus Boiss. & Heldr.	LC	Irano-Turanian
	Inula anatolica Boiss.	LC	Irano-Turanian
	Onopordum anatolicum (Boiss.) Eig	LC	Irano-Turanian
	Ptilostemon afer (Jacq.) Greuter subsp. *eburneus* Greuter	LC	Widespread
	Scorzonera tomentosa L.	LC	Irano-Turanian
	Tripleurospermum callosum (Boiss. & Heldr.) E.Hossain	LC	Unknown

Families	Taxa	Threat Categories	Phytogeographic element
Convolvulaceae	*Convolvulus galaticus* Rost. ex Choisy	LC	Irano-Turanian
Cruciferae	*Alyssum pateri* Nyar. subsp. *pateri*	LC	Irano-Turanian
	Aubrieta canescens (Boiss.) Bornm. subsp. *cilicica* (Boiss.) Cullen	LC	Unknown
	Aubrieta pinardii Boiss.	LC	Irano-Turanian
	Clypeola ciliata Boiss.	EN	Unknown
	Draba bruniifolia Stev. subsp. *heterocoma* (Fenzl) Coode & Cullen var. *nana* (Stapf) Schulz	LC	Unknown
	Hesperis kotschyi Boiss.	LC	Irano-Turanian
Dipsacaceae	*Cephalaria paphlagonica Bobrov*	NT	Unknown
Euphorbiaceae	*Euphorbia anacampseros* Boiss. var. *anacampseros*	LC	Unknown
Geraniaceae	*Erodium amanum* Boiss. & Kotschy	LC	Irano-Turanian
Hypericaceae	*Hypericum aviculariifolium* Jaub. & Spach subsp. *depilatum* (Freyn & Bornm.) Robson var. *depilatum*	LC	Irano-Turanian
	Hypericum aviculariifolium Jaub. & Spach subsp. *depilatum* (Freyn & Bornm.) Robson var. *leprosum* (Boiss.) Robson	LC	Mediterranean
Iridaceae	*Crocus danfordiae* Maw	VU	Mediterranean
	Iris schachtii Markgr.	LC	Irano-Turanian
	Iris stenophylla Hausskn. & Siehe ex Baker subsp. *stenophylla*	LC	Unknown
Labiatae	*Ajuga bombycina* Boiss.	NT	Mediterranean
	Ballota nigra L. subsp. *anatolica* P.H.Davis	LC	Irano-Turanian
	Nepeta congesta Fisch. & Mey. var. *congesta*	LC	Unknown
	Origanum sipyleum L.	LC	Mediterranean
	Phlomis armeniaca Willd.	LC	Irano-Turanian
	Salvia cryptantha Montbret & Aucher ex Benth.	LC	Irano-Turanian
	Salvia heldreichiana Boiss. ex Benth.	LC	Mediterranean
	Salvia hypargeia Fisch. & Mey.	LC	Irano-Turanian
	Scutellaria salviifolia Benth.	LC	Unknown
	Sideritis brevibracteata P.H.Davis	VU	Mediterranean
	Stachys cretica L. subsp. *anatolica* Rech.fil.	LC	Irano-Turanian
	Teucrium chamaedrys L. subsp. *tauricolum* Rech.fil.	LC	Mediterranean
	Thymus sipyleus Boiss. subsp. *sipyleus* var. *sipyleus*	LC	Unknown
	Wiedemannia orientalis Fisch. & Mey.	LC	Irano-Turanian

Families	Taxa	Threat Categories	Phytogeographic element
Leguminosae	*Astragalus brachypterus* Fisch.	Unknown	Irano-Turanian
	Astragalus campylosema Boiss. subsp. *campylosema*	LC	Irano-Turanian
	Astragalus hirsutus Vahl	LC	Unknown
	Astragalus lycius Boiss.	LC	Unknown
	Astragalus lydius Boiss.	LC	Irano-Turanian
	Astragalus mesogitanus Boiss.	LC	Unknown
	Astragalus nitens Boiss. & Heldr.	Unknown	Irano-Turanian
	Astragalus oxytropifolius Boiss.	Unknown	Irano-Turanian
	Astragalus prusianus Boiss.	Unknown	Irano-Turanian
	Astragalus setulosus Boiss. & Bal.	Unknown	Unknown
	Astragalus strictispinis Boiss.	NT	Unknown
	Astragalus suberosus Banks & Sol. subsp. *ancyleus* (Boiss.) Maththews	VU	Unknown
	Astragalus zederbaueri Stadlm.	LC	Irano-Turanian
	Ebenus hirsuta Jaub. & Spach	LC	Irano-Turanian
	Onobrychis armena Boiss. & Huet	LC	Widespread
Liliaceae	*Asphodeline rigidifolia* (Boiss.) Baker	LC	Irano-Turanian
	Colchicum baytopiorum C.D.Brickell	NT	Mediterranean
	Hyacinthella campanulata K.M.Perss. & Wendelbo	VU	Irano-Turanian
Linaceae	*Linum flavum* L. subsp. *scabrinerve* (P.H.Davis) P.H.Davis	LC	Irano-Turanian
	Linum hirsutum L. subsp. *anatolicum* (Boiss.) Hayek var. *anatolicum*	LC	Irano-Turanian
	Linum hirsutum L. subsp. *pseudoanatolicum* P.H.Davis	LC	Irano-Turanian
Plumbaginacae	*Acantholimon halophilum* Bokhari	VU	Irano-Turanian
Ranunculaceae	*Consolida raveyi* (Boiss.) Schröd.	LC	Irano-Turanian
	Consolida stenocarpa (P.H.Davis & Hossain) P.H.Davis	LC	Irano-Turanian
Rosaceae	*Alchemilla holocycla* Rothm.	LC	Irano-Turanian
	Potentilla anatolica Peşmen	LC	Irano-Turanian
Rubiacae	*Asperula stricta* Boiss. subsp. *latibracteata* (Boiss.) Ehrend.	LC	Irano-Turanian
Rutaceae	*Haplophyllum myrtifolium* Boiss.	LC	Irano-Turanian
Santalaceae	*Thesium bertramii* Aznav.	VU	Irano-Turanian

Families	Taxa	Threat Categories	Phytogeographic element
Scrophulariaceae	*Linaria corifolia* Desf.	LC	Irano-Turanian
	Linaria genistifolia (L.) Mill. subsp. *confertiflora* (Boiss.) P.H.Davis	LC	Irano-Turanian
	Linaria iconia Boiss. & Heldr.	LC	Irano-Turanian
	Scrophularia libanotica Boiss. var. *oligantha* Heywood	LC	Irano-Turanian
	Verbascum brachysepalum (Fisch. & Trautv.) Kuntze	LC	Mediterranean
	Verbascum splendidum Boiss.	LC	Mediterranean
	Veronica cuneifolia D.Don subsp. *cuneifolia*	LC	Unknown
	Veronica macrostachya Vahl. subsp. *sorgerae* M.A.Fisch.	VU	Mediterranean
	Veronica multifida L.	LC	Irano-Turanian
Umbelliferae	*Bupleurum lycaonicum* Snogerup	LC	Mediterranean
	Bupleurum sulphureum Boiss. & Bal.	LC	Irano-Turanian
	Eryngium bitynicum Boiss.	LC	Irano-Turanian
	Prangos meliocarpoides Boiss. var. *meliocarpoides*	LC	Unknown

EN: Endangered, **VU:** Vulnerable, **NT:** Near Threatned, **LC:** Least Concern.

Table 2. Total endemic taxa numbers of the largest families found in the studied area.

Families	Number of taxa
Leguminosae	15
Labiatae	14
Compositae	12
Scrophulariaceae	9
Boraginaceae	8
Cruciferae	6

Table 3. Total endemic taxa of the largest genera in the studied area.

Genera	Number of Taxa
Astragalus	13
Centaurea	4
Salvia	3
Veronica	3
Onosma	3

Table 4. Comparison of endemism and phytogeographic elements rate (%) in the studied area and nearby regions (abbreviations are given below the table).

The Floristic Studies ▶		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Total Taxa Numbers ▶ **Phytogeographic El. ▼**		**691**	**440**	**600**	**471**	**461**	**477**	**473**	**1173**	**900**	**512**
Irano-Turanian	%	23.1	32.4	31.0	14.4	13.0	19.1	22.6	19.6	17.0	15.2
Mediterranean	%	9.8	3.8	14.6	10.1	12.5	15.1	15.0	20.1	15.6	20.8
Euro-Siberian	%	6.6	0.4	3.0	2.8	5.7	4.4	3.4	3.5	5.8	3.9
Endemism	%	**14.5**	**15.5**	**13.0**	**14.6**	**14.0**	**16.6**	**16.2**	**18.6**	**11.4**	**11.5**

1. The Flora of Region among Başarakavak, Tatköy and Altınapa Dam (Konya) (Yıldıztugay 2006).
2. Flora of Takkalı Mountains (Konya) (Dural et al. 1984).
3. Contributions to the Flora of Loras, Çal and Kızılören Mountains (Konya) (Tatlı et al. 1993).
4. The Flora of Region Among Kızılören-Hüyük-Derbent (Konya) (Konya) (Durukan 2002).
5. The Flora of Region Sultan Mountains, Doğanhisar (Konya) (Ocakverdi 1984b).
6. The Flora of Region Among Ardıçlı-Bahçesaray-Beykavağı (Konya) (İpekci 2005).
7. Contributions to the Flora of Erenler Mountain (Beyşehir-Konya) (Küçüködük et al. 1996).
8. The Flora of Region Among Bozkır-Çumra Apa Dam and Hadim (Konya) (Tugay 2003).
9. The Flora of Seydişehir Maden Region (Konya) and its environs (Ocakverdi 1984a).
10. The Flora of Yeşildağ-Kurucuova (Beyşehir) (Serin and Çetik 1984).

REFERENCES

Akman Y. 1990. İklim ve Biyoiklim. Palme Yayınları, 319s, Ankara.

Brummit RK & Powel CE. 1992. Authors of Plant Names. Royal Botanic Gardens, 732p, Kew.

Davis PH. 1965-1985. Flora of Turkey and The East Aegean Islands. Edinburgh Üniv. Pres. Vol. 1-9, Edinburgh.

Davis PH, Mill RR & Tan K. 1988. Flora of Turkey and The East Aegean Islands (Supplement). Edinburgh Üniv. Pres. Vol. 10, Edinburgh.

Donner J. 2007. Türkiye bitkileri yayılış haritaları. In: ÇOLAK AH (ed.), Türkiye Bitkileri Yayılış Haritaları, pp. 97, Ankara: Lazer Ofset Matbaa.

Dural H & Ekim T. 1984. Takkalı Dağları'nın Florası. Selçuk Üniversitesi Fen-Edebiyat Fakültesi Fen Dergisi, 3: 183-204, Konya.

Dural H. 1985. Obruk Yaylası ve Karacadağ (Karapınar) Florası. Selçuk Üniversitesi Fen Bilimleri Enstitüsü, Doktora Tezi, Konya (Yayınlanmadı).

Durukan S. 2002. Kızılören-Hüyük-Derbent (Konya) Arasında Kalan Bölgenin Florası. Selçuk Üniversitesi Fen Bilimleri Enstitüsü, Yüksek Lisans tezi, Konya (Yayınlanmadı).

Ekim T, Koyuncu M, Vural M, Duman H, Aytaç Z & Adigüzel N. 2000. Red Data Book of Turkish Plants (Pteridophyta and Spermatophyta). Türkiye Tabiatını Koruma Derneği, Yayın No: 18., Ankara.

Ekim T. 2005. Bitkiler. Türkiye'nin Biyolojik Zenginlikleri. In: KENCE A (ed.), pp. 167-193. Ankara: Türkiye Çevre Sorunları Vakfı Yayını.

Güner A, Özhatay N, Ekim T & Başer KHC. 2000. Flora of Turkey and The East Aegean Islands (Supplement 2). Edinburgh Üniv. Pres. Vol. 11, Edinburgh.

IUCN 2001. IUCN Red List Categories, version 3.1. Gland and Cambridge: IUCN Species Survival Commisison.

İpekci E. 2005. Ardıçlı-Bahçesaray-Beykavağı (Konya) Arasında Kalan Bölgenin Florası. Selçuk Üniversitesi Fen Bilimleri Enstitüsü, Yüksek Lisans Tezi, Konya. (Yayınlanmadı).

Konya Kapali HavzasI Topraklari Serisi. 1978. Toprak Su Genel Müdürlüğü Yayınları, Ankara.

Küçüködük M, Ertuğrul K & Dural H. 1996. Erenler Dağı (Beyşehir-Konya) Florasına Katkılar. *Selçuk Üniversitesi Fen-Edebiyat Fakültesi Fen Dergisi* **13**: 55-71.

Meteoroloji Genel Müdürlüğü 2006. Konya ve Beyşehir'e ait Ortalama, Ekstrem Sıcaklık ve Yağış Değerleri, Konya.

Ocakverdi H. 1984a. Seydişehir Maden Bölgesi (Konya) ve Çevresinin Florası. *Selçuk Üniversitesi Fen-Edebiyat Fakültesi Fen Dergisi* **3**: 91-129.

Ocakverdi H. 1984b. Sultan Dağları, Doğanhisar (Konya) Bölgesinin Florası. *Selçuk Üniversitesi Fen-Edebiyat Fakültesi Fen Dergisi* **3**: 161-183.

Serin M & Çetik R. 1984. Yeşildağ-Kurucuova (Beyşehir) Florası. *Selçuk Üniversitesi Fen-Edebiyat Fakültesi Fen Dergis*i **3**: 7-45.

Tatli A, Eyce B & Serin M. 1993. Loras, Çal ve Kızılören Dağları (Konya) Florasına Katkılar. *Selçuk Üniversitesi Fen-Edebiyat Fakültesi Fen Dergisi* **11**: 46-61.

Tugay O. 2003. Bozkır-Çumra Apa Barajı Ve Hadim (C4 Konya) Arasında Kalan Bölgenin Florası. Selçuk Üniversitesi Fen Bilimleri Enstitüsü, Doktora Tezi, Konya. (Yayınlanmadı).

Tutin TG, Heywood VH, Burges NA, Valentine DH, Walters SM & Webb DA. (eds) 1964-1981. Flora Europaea, vol. 1-5. Cambridge: Cambridge Univ Press.

Ünal M & Behçet L. 2007. Flora of Pirreflit Mountain (Van, Turkey). *Türk J. Bot.* **31**: 193-223.

Yildiztugay E, Bağci Y & Tugay O. 2006. Başarakavak, Tatköy ve Altınapa Barajı (Konya) Arasında Kalan Bölgenin Florası. *Selçuk Üniversitesi Fen-Edebiyat Fakültesi Fen Dergisi* **28**: 99-124.

http://www.turkeyodyssey.com/activities/68-botanic-in-turkey-turkish-flora

REZIME

Endemične biljke Başarakavaka i okoline (Konza, Turska)

Evren Yildiztugay, Yavuz Bağci, Mustafa Küçüködük

Tokom florističkih istraživanja oblast izmedju mesta Başarakavak, Tatköy i Altınapa Dam unutar granica regiona Konya vodjenih izmedju 2004 i 2006, 691 taksona rasporedjenih u 90 familija i 370 rodova je zabeleženo. Broj endemičnih taksona u istraživanom području je 100 (14.5%). Medju endemičnim biljkama najbrojniji su predstavnici familije *Leguminosae* (15), *Labiatae* (14) i *Compositae* (12) uzimajući i vrste i podvrste u razmatranje. Najveći broj endemičnih taksona je u okviru roda *Astragalus* (13). Medju endemičnim predstavnicima 59% su Irano-Turanski, 15% su Mediteranski, 1% su Euro-Siberski elementi dok je 25% drugih (šireg ili nepoznatog rasprostranjenja). Za sve endemične taksona definisana je IUCN-ova (2001) kategorija ugroženosti. Dve endemične vrste su ugrožene i pripadaju EN kategoriji, dok ih se 10 smatra ranjivim vrstama (VU).

Ključne reči: Flora, endemične biljka, Başarakavak, Tatköy, Altınapa Dam, Konya, Turska

Fig. 3. *Clypeola ciliata* Boiss. - EN

Fig. 4. *Silene lycaonica* Chowdh. - EN

Fig. 5. *Dianthus ancyrensis* Hausskn. & Bornm. -- VU

Fig. 6. *Onosma sieheanum* Hayek - VU

Fig. 7. *Sideritis brevibracteata* P.H.Davis - VU

Fig. 8. *Acantholimon halophilum* Bokhari - VU

Fig. 9. *Thesium bertramii* Aznav. – VU

Fig. 10. *Hyacinthella campanulata* K.M.Perss. & Wendelbo - VU