



New Floristic Records for A3 Square (Taşlıyayla and Kızık Plateaus)

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Abstract

This study, prepared at the University of İstanbul, Institute of Sciences, Forest Engineering Department, Program of Forest Botany, covers endemic plants identified in the master thesis entitled “The Flora of Taşlıyayla and Kızık Surroundings.” Research field is located between Bolu and Seben, it is in the A3 square according to the grid system of Davis and it is located in an area in which it is seen the effects of Euro-Siberian, Mediterranean and Irano-Turanian Floristic Regions. In this research note, 51 angiosperm taxa were determined as new square records for Taşlıyayla and Kızık plateaus in A3 square. 13 of the new records are also endemic.

Keywords: New square records, A3 square, Taşlıyayla, Kızık Plateau

A3 Karesi İçin Yeni Floristik Kayıtlar (Taşlıyayla ve Kızık Yaylaları)

Özet

Bu çalışma; İÜ Fen Bilimleri Enstitüsü Orman Mühendisliği Anabilim Dalı, Orman Botaniği Programı'nda, “Taşlıyayla ve Kızık (Bolu-Seben) Çevresinin Florası” adlı yüksek lisans tezi kapsamında A3 karesi için saptanan yeni bitkileri kapsamaktadır. Araştırma alanı; Bolu ili ile Seben ilçesi arasında, Davis'in karelij sistemine göre A3 karesi içerisinde yer almakta olup, Avrupa-Sibirya, Akdeniz ve İran-Turan floristik Bölgeleri'nin etkilerinin görüldüğü bir noktada bulunmaktadır. Yeni kayıtları olarak hazırlanan bu araştırma notunda A3 karesi için 51 takson ilk defa kayıt edilmiştir. Kare için yeni 51 taksondan 13 ayrıca endemiktir.

Anahtar Kelimeler: Yeni kare kayıtları, A3 karesi, Taşlıyayla, Kızık Yaylası

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Introduction

Turkey is located in the junction point of three great floristic regions. Therefore, it is one of the richest floristic centers of the World. This floristic richness is determined greatly. However, new floristic studies still show many new records, new species and taxa in different parts of Turkey. These studies are more important for the vulnerable areas under stress. The area studied is under heavy human impact and some parts of it have started to fill with the water of Seben dam. Together with dam some new buildings are also constructed around the dam.

The area around the dam has a very rich flora because of locating at the transition zone from Black Sea region to Inner Anatolia. It includes 573 plant taxa. The aim of this research note is to submit the new records detected in this area under heavy human impact.

Material and Methods

Study Area

At the lower slopes of Aladağ, which is located in the south of Bolu Plateau, the forest line starts with *Pinus nigra* forests accompanying with *Quercus* locally. And this forest line increases up to 900 m with the mixed *Quercus* and *Pinus nigra* forests. After this elevation, *Pinus nigra* forests are replaced with *Abies* forests. Up to 1500 m mostly *Fagus* accompanies with *Abies*, after 1500 m *Pinus sylvestris* accompanies it. *Abies* is an element of Euro-Siberian floristic region. In the transition to the steppe area the floristic structure of Irano-Turanian starts, and in this area *Abies* leaves its place to *Pinus sylvestris* entirely. The research area is located in a place in which there are only *Abies* and *Pinus sylvestris* and their mixture. Its latitudes and longitudes are 40°32'00"–40°34'03" N and 31°27' 33"–31°41'53" E, respectively (Figure 1).

The research area is under the transition condition of Euro-Siberian, Mediterranean and Irano-Turanian phytogeographic regions. The area is locally under the transition part of sub-euxine and xero-euxine belts. The research area covers about 10.532 ha, and the elevation range is between 880-1732 m (Figure 1). The area having Kızık, Dereceören, Kuzgölcük and Kabak villages, and Solaklar, Nimetli, Dedeler, Ayman, Korucuk, Hacıođlan, Bozyer, Alpogut, Kozyaka, Keskinli and Demirciler plateaus is under heavy human impact.

In Taşlıyayla- Kızık part, the elevation increases 1727 m with the Kayakapı Hill and it decreases 880 m in the Aladağ Stream Valley which is north border of the area. Aladağ Stream Valley that forms a deep and closed path between Ardıç Mountains and Taşlıyayla-Kızık part has a rich flora.

Sub-Euxine forest communities in the north west euxine forest zones, *Pinus sylvestris* forest is a kind of "Calamintha grandiflora-*Pinus sylvestris* forest (Mayer and Aksoy, 1998)." In this kind of forest, on the volcanic rock in the Körođlu Mountains, *Pinus sylvestris* forests take the place of *Pinus nigra* forests in the west, east and south sides.

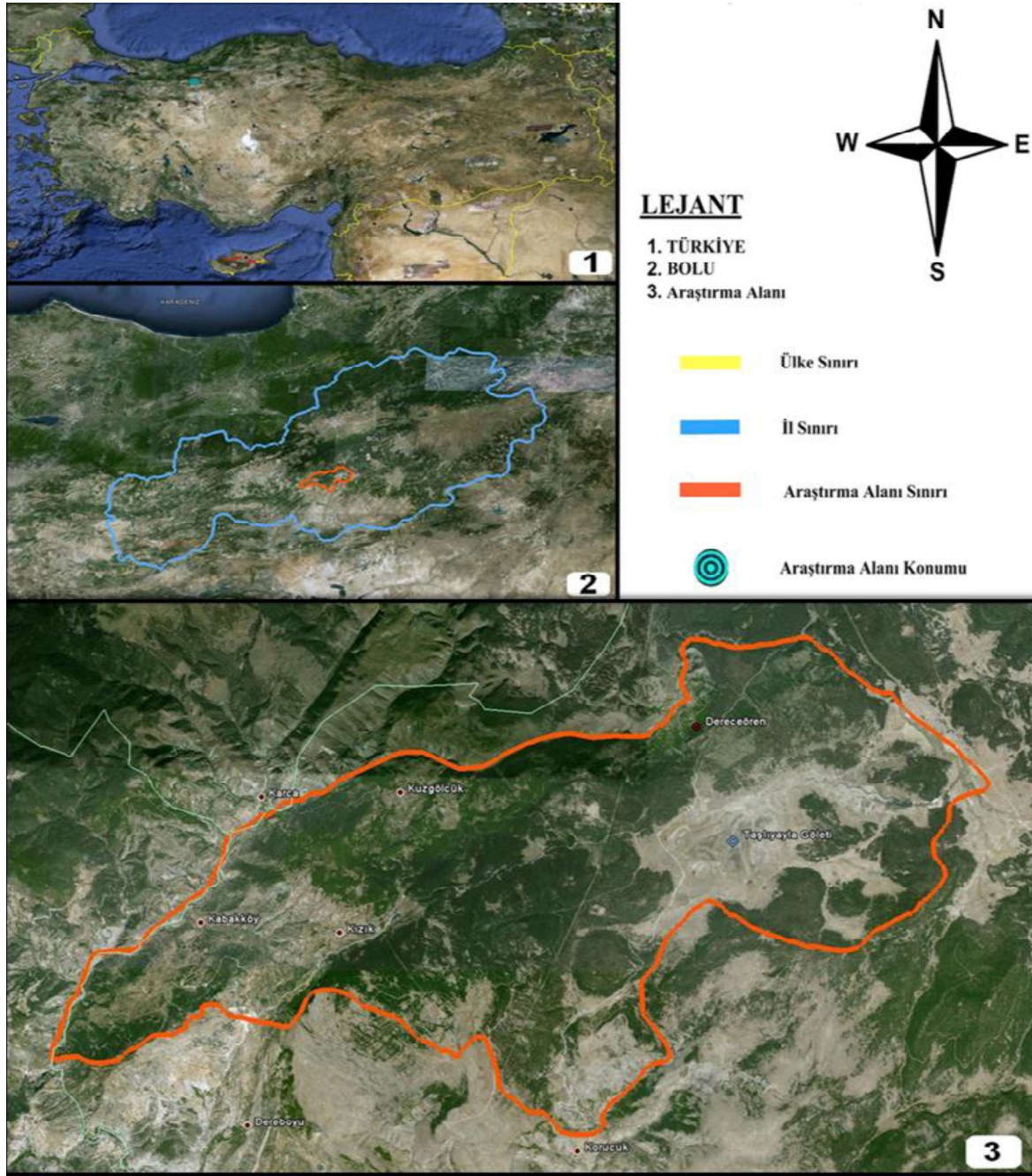


Figure 1. The research area

Methods

The research specimens were collected with 35 field works to Seben: Taşlıyayla and Kızık environments during 2010-2011. In identification of plant samples it was studied in ISTO, ISTE, AIBU, MUFO, GAZI, VANF and BGBM Herbariums, and following references were used: Flora of Turkey and East Aegean Islands (Davis, 1965-1985; Davis ve ark., 1988; Güner ve ark., 2000), Check-List of Additional Taxa to the Supplement Flora of Turkey (Özhatay ve ark., 1994; Özhatay ve ark., 1999) and the studies on the flora of adjacent regions (Akman ve İlarıslan, 1983; Akman ve Ketenođlu, 1979; Akman ve Yurdakulol, 1981; Akman ve ark., 1985; Akman ve Yurdakulol, 1985; Aksoy, 2001; Aksoy, 2006; Bařaran, 2001; Cöbek, 1989; Ekim ve İlarıslan, 1982; Güner ve ark., 2000; Güner, 2000; İkinci, 2000; Kaptanođlu, 1995; Koca ve Yıldırımli, 2004; Özkan ve Aksoy, 2009; Pakpınar, 1995; Sümer, 2002; Akıncı ve Özhatay, 2000; Türker, 1990; Uluđ, 1999; Uçar, 1996; Yıldırımli, 1999;

Yıldırım, 2002; Yıldırım, 2003; Yıldırım, 2008; Yıldırım, 2009; Yıldırım, 2010). Furthermore, in identification of some difficult specimens, it was taken help from expert people to the proper genera.

Results

In the research area 51 different taxa belonging to 23 families were detected as new records. 13 of the new records are also endemic for the area. The whole list of the new taxa given below:

SPERMATOPHYTA

ANGIOSPERMAE

RANUNCULACEAE

Ranunculus saniculifolius Viv.

A3 Bolu: Seben, beneath Solaklar Pletau, Akçakilise Deresi location, unforested area, 1434 m., 17.04.2010, N 40°32'29" E 031°41'23", TUNÇKOL 1143, ISTO 35427

Thalictrum minus L. var. *minus*

A3 Bolu: Seben, Kızık Village, widespread around the Kızık Village Pond, 1508 m., 14.07.2010, N 40°30'37" E 031°32'53", TUNÇKOL 1551, ISTO 35436

PAEONIACEAE

Paeonia peregrina Miller

A3 Bolu: Seben, Kuzgölcük, Köçek Kaya ridge, at slope, 1360 m., 04.06.2011, N 40°31'43" E 031°31'51", TUNÇKOL 2476, ISTO 35437

PAPAVERACEAE

Papaver pilosum Sibth. & Sm.

A3 Bolu: Seben, Dereceören, Asar Dere location, at slope, 1426 m., 20.06.2010, N 40° 30' 24" E 031°37'57", TUNÇKOL 2048, Endemic, Vulnarable (VU).

CRUCIFERAE (Brassicaceae)

Conringia perfoliata (C. A. Mey.) Busch

A3 Bolu: Seben, Kızık-Kozyaka Plateu turnout, beneath the stone quarry, 1417 m., 03.05.2011, N 40°29'26" E 031°30'38", TUNÇKOL 2390, ISTO 35447

Isatis floribunda Boiss. ex Bornm.

A3 Bolu: Seben, on the road between Kabak Village and Kızık Plateu, hillside, 1208 m., 19.06.2011, N 40°29'11" E 031°28'57", TUNÇKOL 2713, ISTO 35449, Endemic, Least Concern (LC), Irano-Turanian element.

Arabis verna (L.) DC.

A3 Bolu: Seben, Dedeler Plateu, beneath the forest, 1495 m., 03.05.2011, N 40°30'43" E 031°38'28", TUNÇKOL 2365, ISTO 35463, Mediterranean element.

Aubrieta canescens (Boiss.) Bornm. subsp. *canescens*

A3 Bolu: Seben, Korucuk Plateu, Dimbillik Sırtı location, rocky land, 1396 m., 03.05.2011, N 40°28'43" E 031°35'04", TUNÇKOL 2332, ISTO 35469, Endemic, Least Concern (LC).

Descurainia sophia (L.) Webb ex Prantl

A3 Bolu: Seben, on the road between Kuzgölcük and Kızık, 1482 m., 31.03.2011, N 40°33'16" E 031°33'00", TUNÇKOL 2303, ISTO 35474

Camelina rumelica Vel.

A3 Bolu: Seben, Kızık, Harman Taşı location, unforested area, 1528 m., 04.06.2011, N 40° 30'20" E 031°32'32", TUNÇKOL 2412, ISTO 35475

CARYOPHYLLACEAE

Dianthus micranthus Boiss. & Heldr.

A3 Bolu: Seben, Nimetli Plateu, meadowland, 1451 m., 10.10.2010, N 40°31'39" E 031°39'09", TUNÇKOL 2101, ISTO 35494

Gypsophila brachypetala Trautv.

A3 Bolu: Seben, Dereceören, Aladağ Stream Valley, at the small and dry tributaries of rivers, unforested area, 1222 m., 10.10.2010, N 40°33'12" E 031°37'22", TUNÇKOL 2149, ISTO 35502, Endemic, Vulnerable (VU).

Silene laxa Boiss. & Kotschy.

A3 Bolu: Seben, Kozyaka Plateu, Kayabaşı Hill location, 1222 m., 14.08.2010, N 40°28'32" E 031° 35'46", TUNÇKOL 1575, ISTO 35504, Irano-Turanian element.

ILLECEBRACEAE

Paronychia beauverdii Czecz.

A3 Bolu: Seben, Kızık Village, north of Kızık location, at rocky lands, 1450 m., 19.06.2011, N 40°29'38" E 031°31'27", TUNÇKOL 2641, ISTO 35513, Endemic, Near Threatened (NT), Irano-Turanian element.

GUTTIFERAE (Hypericaceae)

Hypericum hyssopifolium Chaix subsp. *elongatum* (Ledeb.) Woron var. *elongatum*

A3 Bolu: Seben, above Kızık Village, on the road of Kayakapı Hill, rocky land, 1589 m., 01.09.2011, N 40°30'19" E 031°33'46", TUNÇKOL 2732, ISTO 35521, Irano-Turanian element.

LEGUMINOSAE (Fabaceae)

Astragalus nanus DC.

A3 Bolu: Seben, Korucuk Plateu, Korucukboğazı Deresi location, 1200 m., 04.06.2011, N 40° 28'23" E 031°38'39", TUNÇKOL 2454, ISTO 35572

A. karamasicus Boiss. & Bal.

A3 Bolu: Seben, above Kızık Village, north of Kızık location, 1461 m., 04.06.2011, N 40°30'05" E 031°31'46", TUNÇKOL 2457, ISTO 35578, Endemic, Least Concern (LC), Irano-Turanian element.

Vicia sativa L. subsp. *sativa*

A3 Bolu: Seben, road of Kızık Village, Ulucaklar Fountain, unforested area, 1535 m., 04.06.2011, N 40° 31'19" E 031°35'03", TUNÇKOL 2474, ISTO 35563

Lathyrus brachypterus Cel. var. *brachypterus*

A3 Bolu: Seben, Demirciler Plateu, Karasamanlık Hill, 1549 m., 02.05.2010, N 40°31'07" E 031°35'43", TUNÇKOL 1273, ISTO 35560, Endemic, Least Concern (LC), Irano-Turanian element.

Pisum sativum L. var. *brevipedunculatum* P. H. Davis & Meikle

A3 Bolu: Seben, towards Kabak Village, Yıkılğan Kayası location, at the edge of the field, 1258 m., 04.06.2011, N 40°30'11" E 031°30'18", TUNÇKOL 2442, ISTO 35566

Trifolium speciosum Willd.

A3 Bolu: Seben, Ayman Plateu, Çal Boğazı location, unforested area, 1445 m., 05.07.2010, N 40°33'33" E 031°41'09", TUNÇKOL 1671, ISTO 35590

T. aureum Poll.

A3 Bolu: Seben, between Demirciler Plateu and Karboğaz location, 1440 m., 07.08.2010, N 40°31'11" E 031°38'48", TUNÇKOL 1710, ISTO 35608, Euro-Siberian element.

T. patens Schreb.

A3 Bolu: Seben, around Dereceören, Kuyupınar Hill, 1265 m., 20.06.2010, N 40°33'29" E 031°37'24", TUNÇKOL 1446, ISTO 35600

Melilotus bicolor Boiss. & Bal.

A3 Bolu: Seben, Kabak Village, above the neighborhood, 899 m., 12.09.2010, N 40°28'33" E 031°27'45", TUNÇKOL 2558, ISTO 35585, Endemic, Near Threatened (NT), Irano-Turanian element.

Trigonella spicata Sibth. & Sm.

A3 Bolu: Seben, Kuzgölcük, Büvecik Hill location, 1470 m., 05.07.2010, N 40°31'12" E 031°32'23", TUNÇKOL 1675, ISTO 35609, East Mediterranean element.

Lotus ornithopodioides L.

A3 Bolu: Seben, Nimetli Plateu, Karboğaz location, 1455 m., 10.10.2010, N 40°31'25" E 031°38'55", TUNÇKOL 2173, ISTO 35601, Mediterranean element.

ROSACEAE

Potentilla rupestris L.

A3 Bolu: Seben, Kuzgölcük, Kertlez location, beneath the forest, 1430 m., 18.06.2011, N 40° 31'22" E 031°33'05", TUNÇKOL 2614, ISTO 35628, Euro-Siberian element.

CRASSULACEAE

Sedum obtusifolium C. A. Meyer

A3 Bolu: Seben, Kuzgölcük, Aladağ Stream Valley, 1155 m., 25.09.2010, N 40°32'00" E 031°32'15", TUNÇKOL 2091, ISTO 35647

UMBELLIFERAE (Apiaceae)

Malabaila secacul Banks & Sol.

A3 Bolu: Seben, Kızık Village, on the road of Kayakapı Hill, at the rocky land, 1595 m., 01.09.2011, N 40°30'21" E 031°33'45", TUNÇKOL 2747

DIPSACACEAE

Cephalaria gigantea (Ledeb.) Bobrov

A3 Bolu: Seben, Dereceören, Soğucak Pınarı location, at the edge of the field, 1355 m., 14.08.2010, N 40°33'58" E 031°36'20", TUNÇKOL 1810, ISTO 35679, Black Sea Region (mountain) element.

COMPOSITAE (Asteraceae)

Centaurea amasiensis Bornm.

A3 Bolu: Seben, Dereceören, Gökçepınar Kayası location, 1270 m., 12.09.2010, N 40° 32'59" E 031°37'13", TUNÇKOL 1901, ISTO 35697, Endemic, Least Concern (LC).

C. olympica C. Koch

A3 Bolu: Seben, Dereceören, Su Çatı location, Aladağ Stream Valley, at a dry riverbed, 1303 m., 29.08.2010, N 40°33'48" E 031°37'16", TUNÇKOL 1880 Endemic, Least Concern (LC).

C. thracica (Janka) Hayek

A3 Bolu: Seben, above Kızık Village, the road of Kızık, Başköy Hills, 1539 m., 29.08.2010, N 40°30'39" E 031°32'45", TUNÇKOL 1878, ISTO 35687

Scorzonera mollis Bieb. subsp. *szowitzii* (DC.) Chamberlain

A3 Bolu: Seben, Kabak Village, above the neighborhood, Erenler Hill location, rocky land, 1251 m., 04.06.2011, N 40°29'38" E 031°29'23", TUNÇKOL 2425, ISTO 35715, Irano-Turanian element.

BORAGINACEAE

Myosotis ramosissima Rochel ex Schultes subsp. *ramosissima*

A3 Bolu: Seben, Kabak Village and Kozyaka Plateu turnout, 1382 m., 16.05.2010, N 40°33'52"E 031°39'03", TUNÇKOL 1330, ISTO 35783

M. stricta Link ex Roemer & Schultes

A3 Bolu: Seben, between Demirciler and Çavuşlar Plateus, 1500 m., 02.05.2010, N 40°31'05" E 031°37'04", TUNÇKOL 1272, ISTO 35782, Euro-Siberian element.

Anchusa leptophylla Roemer & Schultes subsp. *incana* (Ledeb.) Chamb.

A3 Bolu: Seben, Korucuk Plateu, Dimbillik ridge, 1476 m., 04.06.2011, N 40°29'19" E 031°36'27", TUNÇKOL 2400, ISTO 35788, Endemic, Least Concern (LC), Irano-Turanian element.

SCROPHULARIACEAE

Scrophularia xanthoglossa Boiss. var. *decipiens* (Boiss. & Kotschy) Boiss.

A3 Bolu: Seben, between Kabak Village and Toprak Hill, at the roadside, 976 m., 04.06.2011, N 40°30'30" E 031°29'37", TUNÇKOL 2455, ISTO 35766, Irano-Turanian element.

Gratiola officinalis L.

A3 Bolu: Seben, Dereceören, Aladağ Stream Valley, wetland, 1331 m., 14.07.2010, N 40° 33' 57" E 031°37'07", TUNÇKOL 1514, ISTO 35750, Euro-Siberian element.

Veronica lysimachioides Boiss.

A3 Bolu: Seben, Dereceören, between Kuyupınar Hill and Aladağ Stream Valley, 905 m., 29.08.2010, N 40°33'43" E 031°37'31", TUNÇKOL 1870, ISTO 35759, Endemic, Least Concern (LC).

OROBANCHACEAE

Orobanche arenaria Borkh.

A3 Bolu: Seben, Kozyaka Plateu, Avdanboğazı location, Çoplum River, 1584 m., 19.06.2011, N 40°29'32" E 031°33'48", TUNÇKOL 2666, ISTO 35960

O. crenata Forsskal

A3 Bolu: Seben, Kabak Village, Aladağ Stream Valley, 948 m., 12.09.2010, N 40°30'40" E 031°29'37", TUNÇKOL 1961, ISTO 35959

ACANTHACEAE

Acanthus dioscoridis L. var. *dioscoridis*

A3 Bolu: Seben, above Kızık Village, between Kızık Lake and Başköy Hill, 1542 m., 01.09.2011, N 40°30'48" E 031°32'56", TUNÇKOL 2736, ISTO 35776

LABIATAE (Lamiaceae)

Salvia cryptantha Montbret & Aucher ex Bentham

A3 Bolu: Seben, Kabak Village, above the neighborhood, Kabak forest ridge, rocky slopes, 1478 m., 19.06.2011, N 40°29'01" E 031°28'41", TUNÇKOL 2700, ISTO 35816, Endemic, Least Concern (LC), Irano-Turanian element.

EUPHORBIACEAE

Euphorbia peplus L. var. *minima* DC.

A3 Bolu: Seben, Kabak Village, Çukurca Tarla ridge, at the edge of the field, 903 m., 10.10.2010, N 40°29'22" E 031°27'48", TUNÇKOL 2245, ISTO 35917, Euro-Siberian element.

E. lathyris L.

A3 Bolu: Seben, Dereceören, Gökçepinar kayası location, at the unforested area, 1290 m., 23.10.2010, N 40°32'49" E 031°37'11", TUNÇKOL 2247, ISTO 35923

ULMACEAE

Celtis tournefortii Lam.

A3 Bolu: Seben, Kabak Village, between Aşılıkbaşı ridge and Aladağ Stream Valley, 938 m., 18.06.2011, N 40°30'26" E 031°29'08", TUNÇKOL 2481, ISTO 35907

MONOCOTYLEDONE

LILIACEAE

Allium scorodoprasum L. subsp. *waldsteinii* (G. Don) Stearn

A3 Bolu: Seben, Nimetli Yaylası, Nimetli Plateu, Karboğaz location, meadowland, 1442 m., 12.09.2010, N 40°31'18" E 031°39'06", TUNÇKOL 1941, ISTO 35861, Euro-Siberian element.

A. guttatum Steven subsp. *dalmaticum* (A. Kerner ex Janchen) Stearn

A3 Bolu: Seben, Taşlıyayla location, beneath the Forestry Department storehouse, 1437 m., 07.08.2010, N 40°31'47" E 031°37'34", TUNÇKOL 1722, ISTO 35847, Mediterranean element.

AMARYLLIDACEAE

Galanthus elwesii Hooker fil. subsp. *elwesii*

A3 Bolu: Seben, Dereceören, Su Çatı, Aladağ Stream Valley, 1285 m., 31.03.2011, N 40°33'43" E 031°37'25", TUNÇKOL 2283, ISTO 35773, East Mediterranean element.

GRAMINEAE (Poaceae)

Stipa holosericea Trin.

A3 Bolu: Seben, Kabak Village, Çukur Tarla ridge, rocky land, 911 m., 14.07.2010, N 40°29'22" E 031°27'51", TUNÇKOL 1511, ISTO 35887, Irano-Turanian element.

Discussion

With this study 51 new records were identified for A3 square. This study is also revealed that floristic studies are still necessary to determine the richness of Turkish flora. When we evaluated the new records based on the phytogeographic regions, we determined that 5 of them belong to Mediterranean, 7 of them to Euro-Siberian, and 12 of them to Irano-Turanian phytogeographic regions (Figure 2). 13 of the new records are also endemic. This finding shows also the effects of three phytogeographic regions here. The spread of these 13 endemic taxa in our country and research area are showed in the (Figure 3 and 4).

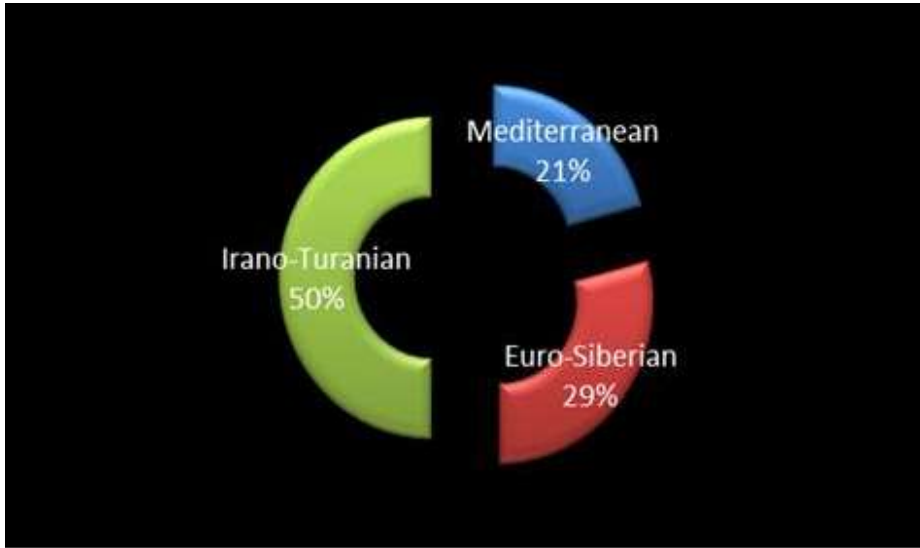


Figure 2. The distribution of the taxa to phyogeographical region

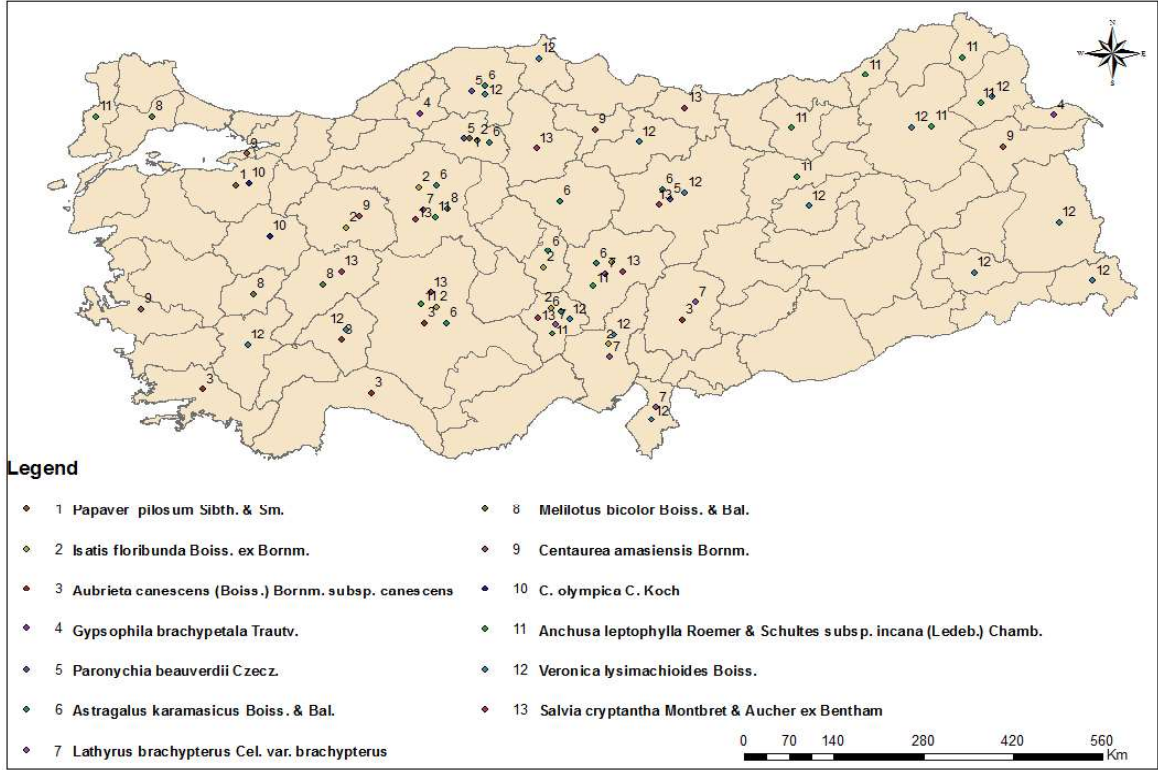


Figure 3. The spread of these 13 endemic taxa in our country

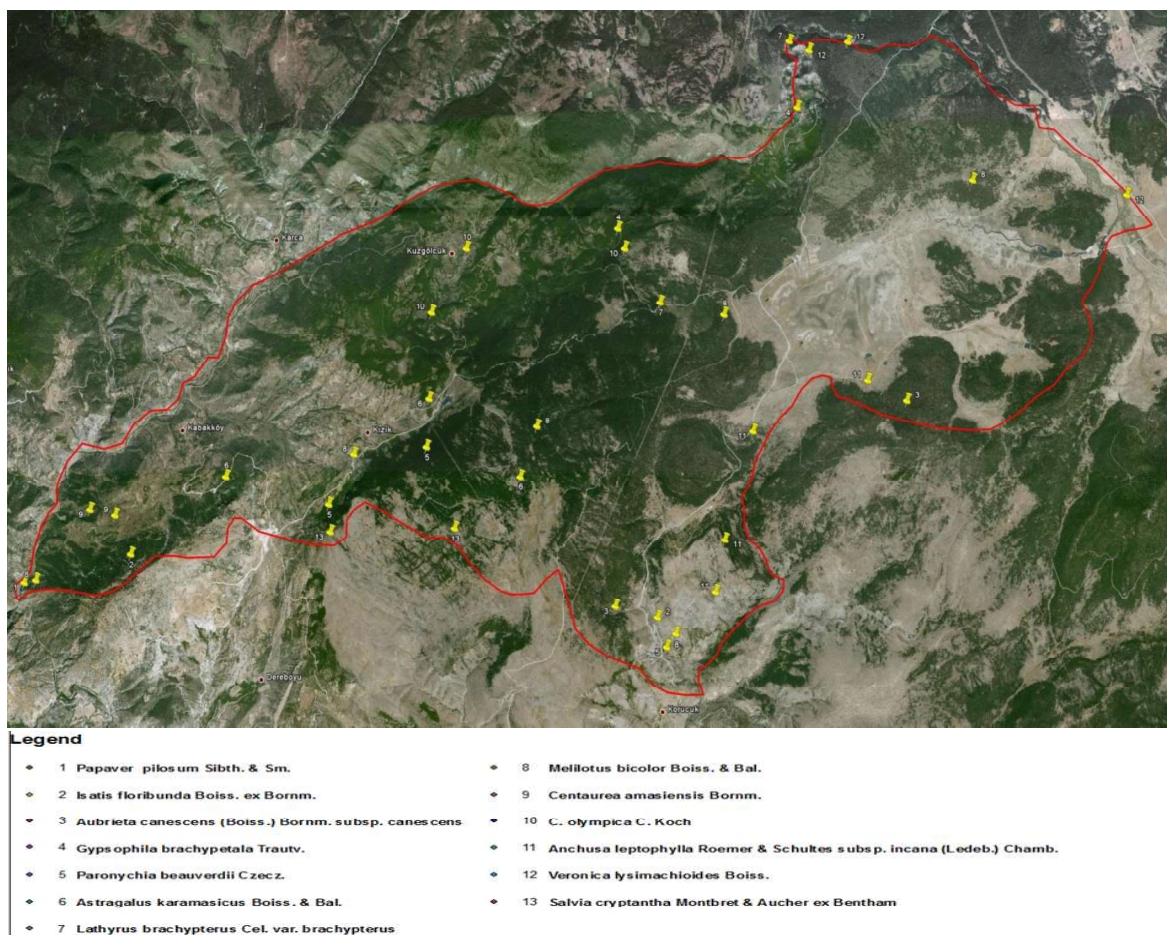


Figure 4. The spread of these 13 endemic taxa in research area

The threat category of 13 endemic taxa found in the research area for A3 square, are identified according to IUCN criteria with the help of the Ekim and his friends' book (2000) Red Data Book. Threat categories are determined according to 3,1 version published by IUCN in 2001.

The result showed that the research area was a bridge between Euro-Siberian and Irano-Turanian floristic regions. In the south sides of the area in which it is seen the effects of Central Anatolian steppe climate, lots of endemic taxa for A3 square belonged to Irano-Turanian floristic region are determined. Also, in the Aladağ stream valley which is the north border of the research area it is seen the effects of the high temperature of the Sakarya valley. Because of this hot weather, in the area it is found the taxa belonged to Mediterranean floristic region. In this valley, there is a huge basin from the Aladağ stream to Sariyer dam and it has a rich floristic diversity.

With the effect of three climatic regions, the number of new taxa for A3 square are high in the research area. At present, because of the Seben dam started to built in 2009 the area studied is under threat. Seben dam has been filled with water during the last two years and covered the important amount of of the area, and some plants have started lost. On the other hand the number of the buildings around the the dam started to increase. Therefore recreation activities and human impacts also started to increase in the area. Their negative impacts may cause to destroy the natural environment here. For that reason human activities should be arranged in a controlled way considering the natural environment and the flora of the region.

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