

Full Length Research Paper

Some ecological characteristics and the flora of Gölcük District and its environs (Kocaeli-Turkey)

Zeki Severoğlu^{1*}, Volkan Altay², İbrahim İlker Özyiğit¹, Mustafa Keskin³, Memduh Serin¹,
Celal Yarci¹, Ülkühan Yaşar⁴ and Göksel Demir⁵

¹Department of Biology, Faculty of Science and Arts, Marmara University, 34722, Göztepe, Istanbul, Turkey.

²Department of Biology, Faculty of Science and Arts, Mustafa Kemal University, 31040, Antakya, Hatay, Turkey.

³Başbüyük M, Toprak Yol Firin S, 19/3, 81550, Maltepe, Istanbul, Turkey.

⁴Environmental Engineering Department, Faculty of Engineering, Bartın University, 74100, Bartın, Turkey.

⁵Environmental Engineering Department, Faculty of Engineering, Bahçeşehir University, 34353, Beşiktaş, Istanbul, Turkey.

Accepted 1 February, 2011

Some ecological characteristics and the flora of Gölcük District and its environs are represented in this study. All the greenery in the district during 2006 to 2009 vegetation seasons was explored. Plant samples were collected, dried, labeled, and determined according to the standard herbarium methods. At the end of the study, 461 species belonging to 295 genera and 85 families were identified. Seven of the identified taxa belonged to Pteridophyta while 454 belonged to Spermatophyta divisions. Eight taxa were Gymnospermae and 446 taxa were Angiospermae members (386 of them Dicots and 60 of them Monocots) in the Spermatophyta division. In addition, four taxa were endemics, so the endemism ratio was 0.87%. The most commonly found plant taxa were in Fabaceae family with 57 taxa (12.36%), and other families; Asteraceae 50 taxa (10.85%), Poaceae 33 taxa (7.16%), Rosaceae 22 taxa (4.77%) and Brassicaceae 21 taxa (4.56%). Species containing the highest number of genera were represented with *Trifolium* (14 taxa, 3.04%), *Lathyrus* (12 taxa, 2.60%), *Vicia* (nine taxa, 1.95%) and *Quercus* (eight taxa, 1.74%) respectively. Life forms were found in the following categories: hemicryptophytes (33.41%), therophytes (32.97%), phanerophytes (18.66%), geophytes (12.80%) and chamaephytes (2.16%). Phytogeographical origins of the taxa were as follows; 98 taxa (21.26%) were from Euro-Siberian elements (including Euxine), 57 taxa (12.36%) consisted of Mediterranean elements (including East Mediterranean), four taxa (0.87%) were of Irano-Turanian origin. Finally, 97 taxa (21.04%) were widespread and 9 taxa (1.95%) were cosmopolitan while phytogeographical origins of 302 taxa were unknown.

Key words: Ecology, flora, Gölcük, Kocaeli, Turkey.

INTRODUCTION

The district of Gölcük (Kocaeli-Turkey) is located in The Marmara Region (40° 40' N, 29° 40' E) towards the east end of the Izmit Gulf, which is about two kilometers wide (Municipality, 2010). The city, together with its

surrounding vineyards and orchards, reaches over to the northern side of the Samanlı Mountains. Neighboring districts are Karamürsel to the west, and Başiskele to the east, Bursa City is to the south and Izmit Gulf to the north (Governorship, 2010). Izmit Gulf has great advantages for marine transportation and security and because of the Gulf is a natural harbor; it has been a tradition to build shipyards from ancient times until Byzantine, Ottoman, and modern-era Republic times (Municipality, 2010). The district covers 199 km² and has the typical physical

*Corresponding author. E-mail: zseveroglu@marmara.edu.tr, zseveroglu@gmail.com. Tel: +90 0 216 346 45 53. Fax: +90 0 216 347 87 83.

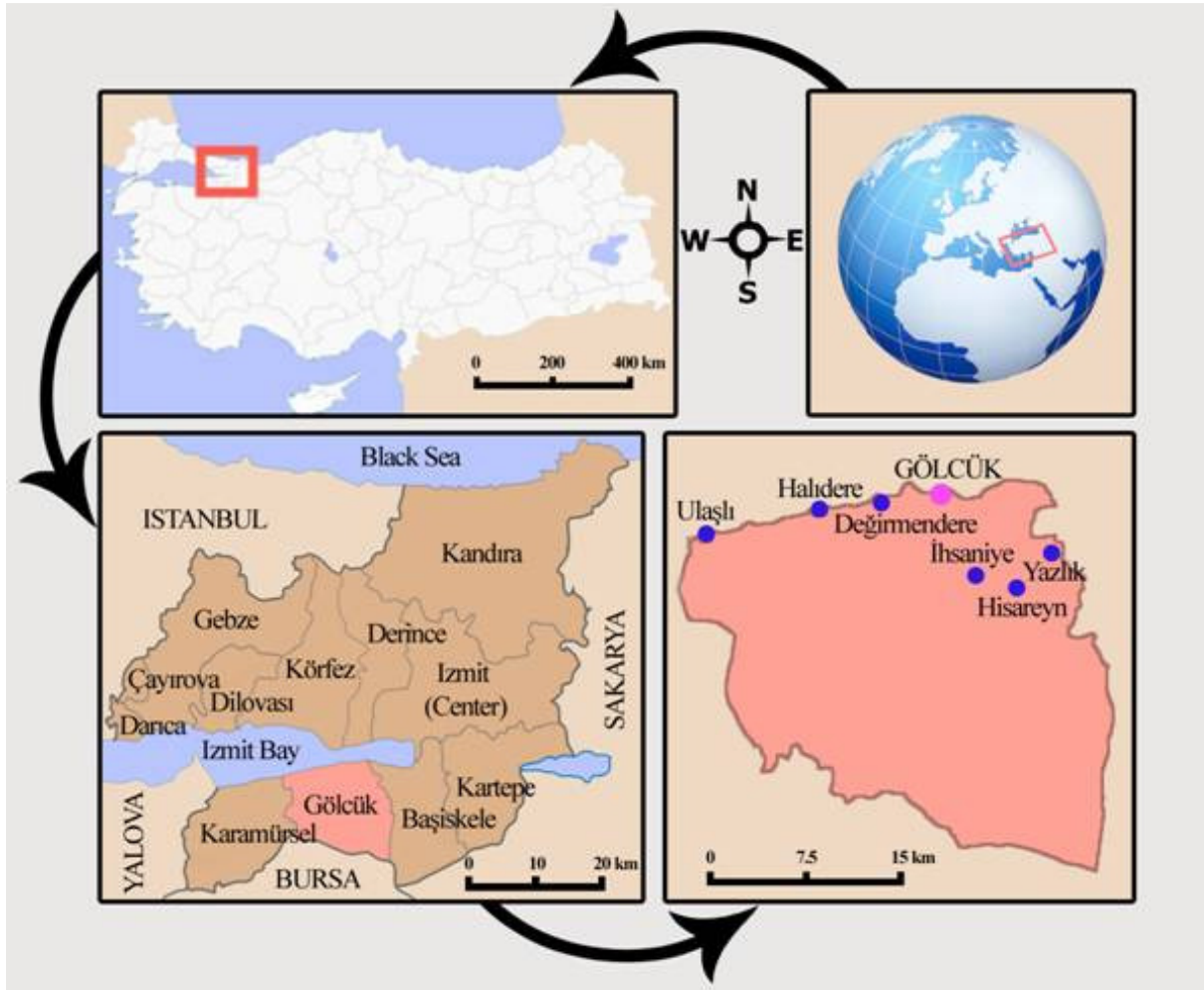


Figure 1. Gölcük District and its location in Turkey.

characteristics of coastal cities, especially on the northern sides (Figure 1) (Governorship, 2010).

The historical background of Gölcük District and its environs is very rich. Phrygians, Lydians, Persians and the Kingdom of Britain reigned in this region, especially South Coast of Izmit Gulf from the third to the eighth centuries BC. The Roman Empire ruled this region until its collapse and Eastern Rome (Byzantium) reigned thereafter (Governorship, 2010). The Seljuks captured it in 1075 for a short time, but it was taken back by the Crusaders in 1101. It had been under the control of Byzantium and Crusaders until Ottomans took it back. Gölcük was conquered by Karamürsel Bey, who was born in Akçakoca. Early Ottomans emigrated to these new lands; especially to the countryside, and individual tribes consequently settled in those places. According to records of the Kanuni Sultan Süleyman (Suleiman the Magnificent) period, Değirmendere and Gölcük were used as settlements (Municipality, 2010). Today's Gölcük history starts with the Turkish battleship Yavuz, which was damaged in the First World War. When Yavuz

anchored at Izmit Gulf in 1924, there used to be a small port and nothing more than a few houses. After the migration of dockworkers and their families from Istanbul, the population of Gölcük grew rapidly, and when the battleship Yavuz was fixed the place became a shipyard. In 1933, the main naval base in Gölcük was established. Historically, World War II deterred the development of Gölcük Shipyard, which was realized only after 1950 (Governorship, 2010). Gölcük became an administrative district in 6/15/1936 and executed in 11/9/1936. As Izmit is an industrialized city, there has been a rapid development in building in Gölcük and that has caused many people from different cities to move to Gölcük (Municipality, 2010).

After the military shipyard was founded in the district for its geographical convenience, Gölcük underwent a rapid urbanization process and while its population was about 5000 in 1940 by the year 2005 its population was about 108,000. In spite of the August 17th earthquake, which was called "the disaster of the century", Gölcük thereafter became a rapidly growing city (Municipality, 2010). The

Gölcük earthquake started on Tuesday, August 17th, 1999 at 03:01 AM local time, and had a moment magnitude of $M_w=7.4$ (Efe, 2000). The cause of the earthquake was the sudden breakage or rupture of the earth's crust along the western part of the North Anatolian fault zone. This earthquake affected a widespread area that runs from the city of Bolu to the district of Avcılar (Western outskirts of Istanbul). Following the seismic event, over 15,000 people died and 24,000 were injured (Ansal et al., 1999; Efe, 2000). After recovering, the lower side of Bursa - Izmit highway was left and new settlements were built on the hills. Its population, which had decreased from 77 to 56 thousand, began to increase again. With the establishment of the Ford Auto Factory and University, the district also began to develop again (Municipality, 2010). Today, the Gölcük administrative district has six towns including Gölcük (center) and Değirmendere, İhsaniye, Halidere, Ulaşlı, Hisareyn, Yazlık and 23 villages (Governorship, 2010). According to 2009 data, the population of the district is 129,713 (men 65,753) (women 63,960) (Tuikapp, 2010).

Since the Gölcük District is a typical naval city, its economy relies mainly on shipyards (on the coast). Inlands, agriculture (wheat, corn, beans, oats, nuts, apples, pears, grapes and olives and kiwi fruit are grown) and greenhouse production have improved in recent years. Livestock farming has not been developed yet; only individual breeding is present for domestic consumption. Beekeeping has also an important place in the economy. In accordance with the statistics of the year 2004, the unemployment rate has decreased to 6.7%. That is mainly because an industrial giant, Ford Otosan, has recently started operations and has been providing new jobs (Municipality, 2010).

Gölcük District has an elevation range of 1 to 900 m above sea level. It has many hills and plateaus topographically. The Southern side of the district is surrounded by Samanlı Mountains (Governorship, 2010). The elevation of the Samanlı Mountain range is 850 m on the west side. To the east, elevations can exceed 1250 m (Efe, 2000). A few rivers (Aşar Dere, Aydınbey Deresi, Halı Dere, Değirmendere, Ulaşlı Dere, Beyoğlu Deresi) run in the study area, but they are not very long and large (DSİ, 2010). The geological structure of eastern Marmara was mostly formed during the Eosen-Oligosen period by the closing of the Intrapontid Ocean. During this period, huge areas were covered by the debris of volcanic eruptions. There are different ages of the geological formations (from Paleozoic to Quaternary) found in the study area. The oldest formations of the study area consist of Precambrian and Paleozoic metamorphic rocks containing serpentine, schist, gneiss and granites. Paleozoic formations are outcropped in the Elmacık and Samanlı Mountains. Izmit Bay is located along the North Anatolian fault line. In its eastern portions, there are vast alluvial plains between Sapanca Lake and Izmit Bay. The ground of these plains generally consists of very thick, moderately clayey or silty sand strata. Sedimentary

deposits with rounded pebble, gravel, and sand are common in the plains. Areas adjacent to the fault line are not suitable for development by virtue of these ground features. The percentage risk of liquifaction is high in the lowest plains of the area (Efe, 2000).

Spodosol soil types are common in the Kocaeli peninsula and Black Sea coastal zone. This soil type is rich in organic material. Ultisol soil types are seen with spodosol in some parts. These soil types have A, B and C-horizons and they are yellowish and reddish in color. Inceptisols and lithosols are also seen in degraded areas. Fluvent soil types found in the study area are common on young soil groups (Efe, 2000).

Gölcük District has a type of Mediterranean climate, which is associated with the oceanic climate of the Black Sea where it is seen in the northern parts. January and February are the coldest months while July and August are the warmest. Annual precipitation is about 814.7 mm, most occurring in winter. In the summer, low precipitation and high temperatures prevail with an annual mean temperature of 14.6°C in last three decades. Between May and September, the temperature is generally above 29°C and between November and April, it is rarely observed to drop below 0°C. In the vegetation period, the daily mean temperature is 8°C for about 250 days (between 15 April and 20 December) (DMİ, 2010). The rain regime is W. A. Sp. Su. (Winter, Autumn, Spring, Summer). Figure 2 (Ombrothermic diagram) shows the bioclimatic characteristics of Gölcük District and its environs.

The general vegetation consists of quite rich mixed forests and maquis, mainly formed of *Quercus* L., *Fagus* L., *Castanea* Miller (Fagaceae), *Carpinus* L. (Corylaceae), *Arbutus unedo*, *Erica* sp. (Ericaceae), *Phillyrea latifolia* (Oleaceae), *Cistus* sp. (Cistaceae) taxa and they are mainly distributed on the mountain chains and hills. The shrub vegetation is mainly formed of *Laurus nobilis* (Lauraceae), *Phillyrea latifolia* (Oleaceae), *Arbutus unedo*, *Erica arborea* (Ericaceae), *Juniperus oxycedrus* (Cupressaceae), *Paliurus spina-christi* (Rhamnaceae) and *Spartium junceum* (Fabaceae) (Ayberk, 1987).

MATERIALS AND METHODS

The plant samples collected in Gölcük District and its environs were the materials of this study. The samples were collected, dried, labeled and determined according to the standard herbarium methods and the flora in the district was explored during 2006 to 2009 vegetation seasons. The plant specimens were identified by using "Flora of Turkey and the East Aegean Islands" (Davis, 1965-1985; Davis et al., 1988; Güner et al., 2000) and deposited in MÜFE Herbarium (Faculty of Science and Arts Herbarium, Marmara University). The flora is listed in the Appendix 1 and the floristic list is arranged in alphabetical order as family, genera and species. Life forms [phanerophytes (Ph), chaemaphytes (Ch), hemicyptophytes (H), therophytes (Th), geophytes (G), helophytes (He)] were determined according to Raunkiaer system (Raunkiaer, 1934) and phytogeographical origins [Euro-Siberian (Euro.-Sib. El.), Irano-Turanian (Ir.-Tur. El.), Mediterranean (Medit. El.), East

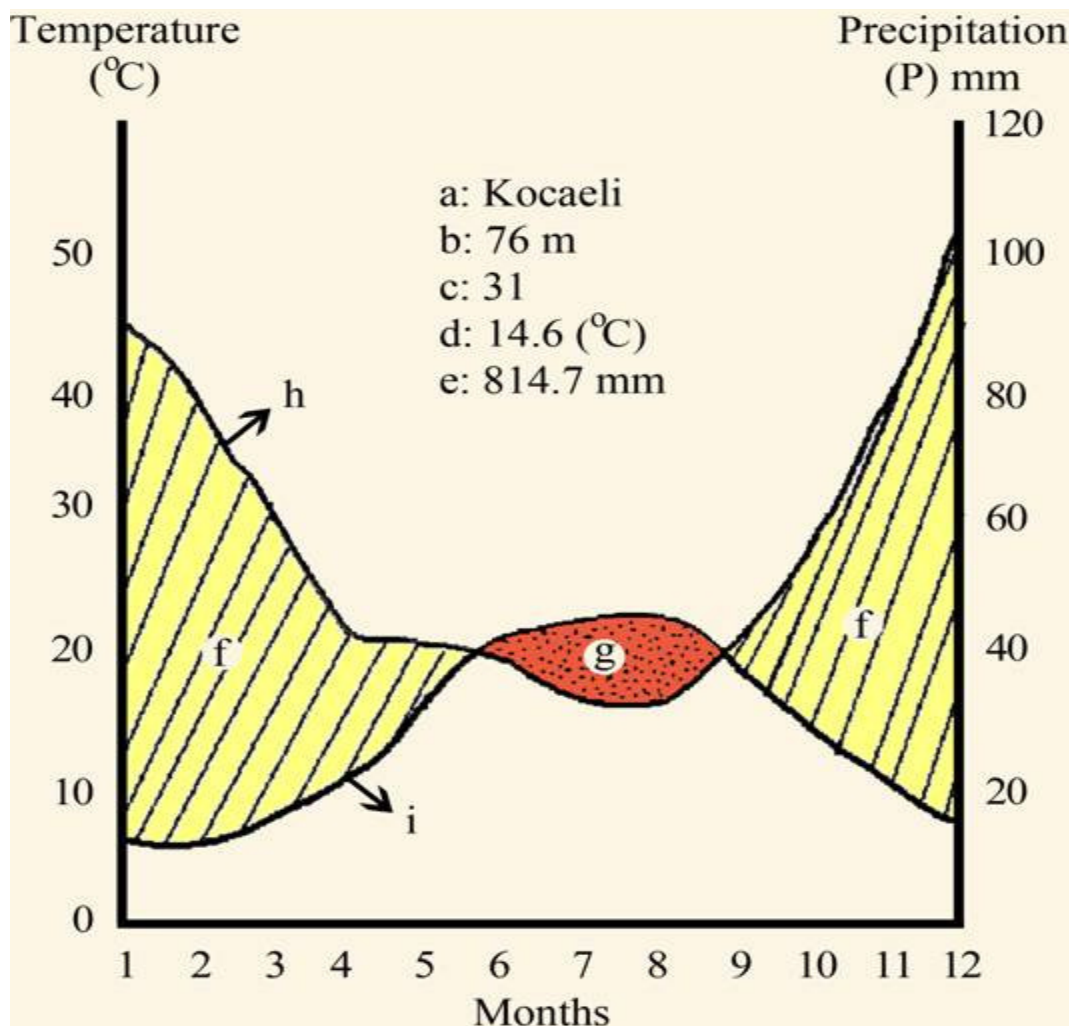


Figure 2. The Ombrothermic Diagram of Gölcük District. a: Name of the meteorological station, b: Altitude of the meteorological station, c: Meteorological observation time (year), d: Average temperature (annual), e: Average precipitation (annual), f: Precipitated period, g: Drought period, h: Precipitation curve, i: Temperature curve.

Mediterranean (E. Medit. El.) and Euxine (Euxine El.) are mentioned in Appendix 1. Additionally, life spans (perennial, biennial and annual), distribution (widespread or cosmopolitan), endemism, locality code and altitude information are given in the Appendix 1 too. The categories and criteria of rare and endangered species are fixed according to Ekim et al., (2000) and "Red Data List" of International Union for the Conservation of Nature and Natural Resources (IUCN, 2010). In Appendix 2, the collection dates of plant specimens, their localities, and the locality codes are given.

RESULTS AND DISCUSSION

In this study, a total of 461 vascular plant species belonging to 295 genera and 85 families were identified from the collected plant samples. Seven of the identified taxa were Pteridophyta members whilst 454 were Spermatopyta. The Angiosperms comprised 446 taxa within 283 genera and 77 families, the Gymnosperms consisted of eight taxa in three families and six genera,

and the Pteridophytes included seven taxa in six genera and five families. It was determined that 386 of the taxa belonged to dicots while 60 were monocots. 295 of the total taxa were perennials whilst, 153 were annuals and 13 were biennials. Floristic properties of the research area are given in Table 1. As it is seen in the table, the most observed taxa in the research area were dicots, followed by monocots, Gymnosperms and Pteridophyta members.

The following families were represented by the largest number of taxa; Fabaceae (57 taxa, 12.36%), Asteraceae 50 taxa (10.85%), Poaceae 33 taxa (7.16%), Rosaceae 22 taxa (4.77%) and Brassicaceae 21 taxa (4.56%), which formed 39.70% of the whole taxa. In Table 2, comparison for the percentages of the families including the highest number of taxa in the study area and closer areas is given (Kaynak, 1997; Akıncı and Özhatay 2004; Sezer, 2006; Akaydın et al., 2006; İkinci and Güner,

Table 1. Floristic properties of the research area.

Division/Subdivision	Family number	Family (%)	Species number	Species (%)
Pteridophyta	5	5.88	7	1.52
Gymnospermae	3	3.53	8	1.74
Monocotyledoneae	8	9.41	60	13.01
Dicotyledoneae	69	81.18	386	83.73
Totally	85	100	461	100

Table 2. The comparison for the percentages of the families including the highest number of taxa in the study area and closer areas.

Family	Study area	Armutlu	Keltepe	Şile	Ballıkayalar	Gölcük
Fabaceae	12.36	10	7.41	13.4	9.1	8.7
Asteraceae	10.85	13.6	9.33	10.2	14.6	9.3
Poaceae	7.16	5	6.22	10.5	6.2	9.3
Rosaceae	4.77	4.1	5.26	5.7	3.3	5.4
Brassicaceae	4.56	5.4	4.06	9.95	2.6	3.9

References: Armutlu/Yalova - (Kaynak, 1997), Keltepe/Kocaeli - (Akıncı and Özhatay 2004), Şile/Istanbul - (Sezer, 2006), Ballıkayalar/Gebze/Kocaeli - (Akaydın et al., 2006), Gölcük/Bolu - (İkinci and Güner, 2007).

Table 3. Comparison of some large genera ratios (%) determined in the study area with closer areas (References are below in Table 2).

Genera	Study area	Armutlu	Keltepe	Şile	Ballıkayalar	Gölcük
<i>Trifolium</i>	3.04	2.42	2.2	4.8	2.4	1.7
<i>Lathyrus</i>	2.6	0.88	0.95	1.6	0.72	1.08
<i>Vicia</i>	1.95	1.54	0.23	0.9	0.72	2.2
<i>Quercus</i>	1.74	0.77	0.71	1.13	1.4	0.65

2007).

Although it is known that the Asteraceae family has the highest number of taxa in the flora of Turkey and most parts of the Central Europe and Asia, Fabaceae family members were mostly found in Gölcük District and its environs (Davis, 1965 and 1985; Shaltout and El-Sheikh, 2002; Antipina, 2003; Amanatidou, 2005; Yarcı et al., 2007; Maxwell, 2009; Altay et al., 2010; Osma et al., 2010). When compared with results of the similar studies in closer areas, only in Şile District and in our study area, Fabaceae family members are predominant and Asteraceae family is the second largest family. Like many other areas in Turkey, Asteraceae is the predominant family in Armutlu, Keltepe, Ballıkayalar and Gölcük (Bolu) areas (Table 2).

The Fabaceae family varies in habit from annual and perennial herbs to shrubs, trees, vines/lianas, and even a few aquatics, and therefore it is cosmopolitan in distribution and well-represented throughout temperate and tropical regions of the world (Rundel, 1989). The preference of Fabaceae members for semi-arid to arid habitats is related to a nitrogen-demanding metabolism, which is thought to be an adaptation to climatically

variable or unpredictable habitats (McKey, 1994). The most common genera were *Trifolium* (14 taxa, 3.04%), *Lathyrus* (12 taxa, 2.60%), *Vicia* (nine taxa, 1.95%) and *Quercus* (eight taxa, 1.74%). Comparison of some large genera ratios determined in the study area with other researches realized in closer areas is given in Table 3. As it is seen in the table, genus *Trifolium* is present in all researches realized in closer areas like many parts of Turkey (Davis, 1965 to 1985; Kaynak, 1997; Akıncı and Özhatay 2004; Sezer, 2006; Akaydın et al., 2006; İkinci and Güner, 2007).

In this study, only four taxa [*Abies nordmanniana* (Stev.) Spach subsp. *bornmuellerina* (Mattf.) Coode and Cullen (Pinaceae), *Campanula lyrata* Lam. subsp. *lyrata* (Campanulaceae), *Lathyrus undulatus* Boiss. (Fabaceae) and *Crepis macropus* Boiss. and Heldr. (Asteraceae)] are endemic and endemism ratio is 0.87%. According to the "Red Data Book of Turkish Plants" by Ekim et al., (2000), *A. nordmanniana*, *C. macropus* and *C. lyrata* are within the groups of Lower Risk (LR) and Least Concern (LC) while *L. undulatus* is within the group Vulnerable (VU). Davis et al. (1988) suggested that endemism rate of the Euro-Siberian phytogeographical region is lower than

two other phytogeographical regions in Turkey. As a matter of fact, our research area is within the Euro-Siberian phytogeographical region and this may explain the low endemism rate. In the research area, two taxa were found within the Bern Convention (The Convention on the Conservation of European Wildlife and Natural Habitats), which was signed in Switzerland in 1979 and became effective on 1st June 1982; *Vaccinium arctostaphylos* L. (Ericaceae) and *Cyclamen coum* Miller var. *coum* (Primulaceae) (Bern, 1979; Özhatay et al., 2003).

The largest groups of life forms were found as hemipterophytes (33.41%) and therophytes (32.97%). The percentages of other life forms were as follows; phanerophytes (18.66%), geophytes (12.80%) and chamaephytes (2.16%) in Gölcük District and its environs. As it is known, therophytes and hemipterophytes are widespread in areas where a Mediterranean climate is predominant (Akman and Ketenoğlu, 1987). Although our study area is very close to the Euro-Siberian phytogeographical region, it is also under the influence of the Mediterranean climate at some places.

Euro-Siberian elements (including Euxine) with 98 taxa (21.26%) were found as the most common phytogeographical elements followed by the Mediterranean elements (including East Mediterranean) with 57 taxa (12.36%) and Irano-Turanian elements with four taxa (0.87%). Additionally, 97 taxa (21.04%) were widespread, 9 taxa (1.95%) were cosmopolitan whilst phytogeographical origins of 302 taxa were unknown. It is obviously known that Turkey is under the influence of continental, oceanic and Mediterranean climate types. The oceanic climate prevails on the northern slopes along the 1500 km Black Sea Turkish coast, but at some points of this coastal zone, influence of the Mediterranean climate is present as well (İkinci and Güner, 2007).

The floristic structure of Gölcük District and its environs has been facing a severe destruction. This could be mostly as a result of anthropogenic pressures, which damage the vegetation willingly or unwillingly. As it is known, the August 17th 1999 earthquake caused catastrophic and dramatic changes in the land cover of Gölcük and environs. After the earthquake, a rapid urbanization and industrialization began within the area, especially on the parent rocks. Although this policy was a kind of rapid solution for desperate people in the area, the result of this process was destructive to floristic diversity. Furthermore, as a result of legal and sometimes illegal forestry activities, the number of *Fagus*, *Carpinus*, *Quercus* and other trees were reduced and under forest flora has vanished in most of the habitats. In the area, enlargement of the agricultural areas, overgrazing, increasing of touristic constructions and forest fires damage the vegetation.

Conclusion

Overall, the current study found 461 plant species belonging to 85 families and 295 genera in Gölcük and its

environs. Major floristic destruction in the region reflects recent disasters in the form of earthquakes, and the subsequent changes in human population. Despite all these shortcomings, the current study showed that Gölcük and its environs have rich plant diversity. In conclusion, for the protection of the vegetation in the study area, the local municipal authorities should apply strong sanctions for the negative effects and attempts should be made to make people conscious about the problem.

ACKNOWLEDGEMENTS

This study is supported by Marmara University, Commission of Scientific Research Project under grant FEN-KPS-100105-0074. The authors also thank the undergraduate laboratory assistants Miss. Busecan Aksoydan and Mr. Neşet Kaan Karahan for rearranging the Tables and Figures, Research Assistant Mr. Ahmet Yılmaz and Bahçeşehir University, English Preparatory School Directory for rechecking language of the document.

REFERENCES

- Akaydın G, Özmen E, Özüdoğru B (2006). The flora of Ballıkayalar Valley (Gebze-Kocaeli). *Firat Univ. Sci and Eng. J.* 18 (3): 279-289.
- Akinci Ş, Özhatay E (2004). The flora of Keltepe Area (Kocaeli/Turkey). *J. Fac. Pharm.*, 37: 23-54.
- Akman Y, Ketenoğlu O (1987). *Vegetation Ecology*. A.U. Science Faculty, No: 146. Ankara, Turkey.
- Altay V, Özyiğit İ, Yarcı C (2010). Urban flora and ecological characteristics of the Kartal District (Istanbul): A contribution to urban ecology in Turkey. *Sci. Res. Essay.*, 5: 183-200.
- Amanatidou D (2005). Analysis and evaluation of a traditional cultural landscape as a basis for its conservation management. A case study in Vikos-Aoos National Park-Greece", PhD. Thesis, Albert-Ludwigs University, Germany, pp. 1-225.
- Ansal A, Bardet JP, Bray J, Cetin O, Durgunoglu T, Erdik M, Kaya A, Ural D, Yılmaz T, Youd L (1999). Initial geotechnical observations of the August 17, 1999, Izmit earthquake (A report of the Turkey-US geotechnical reconnaissance team, September 3, 1999. National Information Service for Earthquake Engineering, University of California, Berkeley. Online at <http://nisee.berkeley.edu/turkey/report.html>.
- Antipina GS (2003). Urban flora as a component of the urban ecosystems in the Taiga Zone: An example of Karelian Cities. *Russian J. Ecol.*, 34: 215-218.
- Ayberk S (1987). The distribution of the natural plant populations and ecological factors in the eastern parts of Samanlı Mountains. *J. Nature Agric. For.*, 11: 152-167.
- Bern (1979). *The Convention on the Conservation of European Wildlife and Natural Habitats* (Bern, 1979): Procedures of Application in Practice. Online at <http://www.jiwp.com/contents/bern.pdf>.
- Davis PH (1965-1985). *Flora of Turkey and the East Aegean Islands*. Vol. 1-9. Edinburg Univ. Press, Edinburg. UK.
- Davis PH, Mill RR, Tan K (1988). *Flora of Turkey and the East Aegean Islands* (Supplement). Vol. 10. Edinburg Univ. Press, Edinburg. UK.
- DMI (2010). The Official Website of Turkish State Meteorological Service. <http://www.dmi.gov.tr>.
- DSİ (2010). The Official Website of General Directorate of State Hydraulic Works. <http://www.dsi.gov.tr>.
- Efe R (2000). Gölcük and Düzce Earthquakes - 1999. Fatih University Publications. No: 8. Istanbul- Turkey.
- Ekim T, Koyuncu M, Vural M, Duman H, Aytaç Z, Adıgüzel N (2000). *Türkiye Red Data Book of Turkish Plants - Pteridophyta and*

- Spermatophyta. Türkiye Tabiatını Koruma Derneği Yayınları, Ankara, pp. 1-30.
- Governorship (2010). The Official Web Site of Gölcük District Governorship. <http://www.golcuk.gov.tr>
- Güner A, İkinci İkinci N, Güner A (2007). Flora of the Gölcük Area (Bolu, Turkey). *Turk. J. Bot.*, 31: 87-107.
- Güner A, Özhatay N, Ekim T, Başer KHC (2000). Flora of Turkey and the East Aegean Islands (Supplement 2). Vol. 11. Edinburg Univ. Press, Edinburg. UK.
- IUCN (2010). The Website of International Union for Conservation of Nature. <http://www.iucn.org>.
- Kaynak G (1997). Flora of Armutlu Peninsula III, Lagacali., 20(1): 63-98.
- Maxwell JF (2009). Vegetation and vascular flora of the Mekong River, Kratie and Steung Treng Provinces, Cambodia. *Maejo Int. J. Sci. Technol.*, 3: 143-211.
- McKey D (1994). Legumes and Nitrogen: The Evolutionary Ecology of a Nitrogen-Demanding Lifestyle. In *Advances in Legume Systematics, Part 5, The Nitrogen Factor* (Sprent JI, McKey, D eds.). Royal Botanic Gardens, Kew, UK. pp. 211-228.
- Municipality (2010). The Official Web Site of Gölcük District Municipality. <http://www.golcuk.bel.tr>.
- Osma E, Altay, V, Özyiğit İİ, Serin M (2010). Urban vascular flora and ecological characteristics of Kadıköy district, Istanbul, Turkey. *Maejo Int. J. Sci. Technol.*, 4(1): 64-87.
- Özhatay N, Byfield A, Atay S (2003). Important Plant Areas of Turkey. WWF Turkey, Istanbul, pp. 1-28.
- Raunkiaer C (1934). *The Life Forms of Plants and Statistical Plant Geography*. Clarendon Press, Oxford, UK, pp. 1-35.
- Rundel PW (1989). Ecological Success in Relation to Plant Form and Function in The Woody Legumes. In Stirton CH, Zarucchi JL (eds.). *Advances in Legume Biology (Monographs in Systematic Botany)*. Missouri Botanical Garden Press, US., 29: 377-398.
- Sezer Y (2006). The flora and vegetation of Şile and environs (Istanbul). M.Sc. thesis, Marmara University, Istanbul, Turkey, pp. 68-92.
- Shaltout KH, El Sheikh MA (2002). Vegetation of the urban habitats in the Nile Delta region, Egypt. *Urban Ecosyst.*, 6: 205-221.
- Tuikapp (2010). The Official Web Site of Turkish Republic Office of Prime Ministry Statistics Institution. <http://tuikapp.tuik.gov.tr>.
- Yarçı C, Serin M, Altay V (2007). The segetal vegetation of Kocaeli Province (Turkey). *Ekoloji*, 63: 23-33.

Appendix 1

Life forms	Divisio/Family/Species	Life span	Phytogeographical Origin	Distribution	Endemism	Locality Code	Altitude (m)
Pteridophyta							
Aspleniaceae							
G	<i>Asplenium trichomanes</i> L.	Perennial				Loc 20a	300
G	<i>Phyllitis scolopendrium</i> (L.) Newman	Perennial				Loc 14c	350
Athyriaceae							
G	<i>Athyrium filix-femina</i> (L.) Roth.	Perennial				Loc 14d	300
Equisetaceae							
G	<i>Equisetum hyemale</i> L.	Perennial				Loc 19a	700
G	<i>Equisetum palustre</i> L.	Perennial				Loc 14b	350
Hypolepidaceae							
G	<i>Pteridium aquilinum</i> (L.) Kuhn.	Perennial				Loc 14b	350
Polypodiaceae							
G	<i>Polypodium vulgare</i> L. subsp. <i>vulgare</i>	Perennial				Loc 6f	300
Spermatophyta							
Gymnospermae							
Cupressaceae							
Ph	<i>Cupressus sempervirens</i> L.	Perennial				Loc 30k	300
Ph	<i>Juniperus oxycedrus</i> L. subsp. <i>oxycedrus</i>	Perennial		Widespread		Loc 25a	350
Pinaceae							
Ph	<i>Abies nordmanniana</i> (Stev.) Spach subsp. <i>bornmuelleriana</i> (Mattf.) Coode and Cullen	Perennial	Euxine El.		Endemic	Loc 25b	750
Ph	<i>Cedrus libani</i> A.Rich.	Perennial	Medit. El.			Loc 30m	750
Ph	<i>Pinus brutia</i> Ten.	Perennial	E. Medit. El.			Loc 17c	250
Ph	<i>Pinus nigra</i> Arn. subsp. <i>pallasiana</i> (Lamb.) Holmboe	Perennial				Loc 29a	430
Ph	<i>Pinus sylvestris</i> L.	Perennial	Euro-Sib. El.			Loc 29b	530

Appendix 1. Contd.

Taxaceae					
Ph	<i>Taxus baccata</i> L.	Perennial		Loc 17e	550
Angiospermae					
Dicotyledoneae/ Magnoliopsida					
Aceraceae					
Ph	<i>Acer campestre</i> L. subsp. <i>campestre</i>	Perennial		Loc 6c	300
Ph	<i>Acer monspessulanum</i> L.	Perennial		Loc 8e	300
Ph	<i>Acer platanoides</i> L.	Perennial	Euro-Sib. El.	Loc 8b	300
Amaranthaceae					
Th	<i>Amaranthus retroflexus</i> L.	Annual		Loc 30d	300
Anacardiaceae					
Ph	<i>Cotinus coggyria</i> Scop.	Perennial		Loc 32a	300
Ph	<i>Pistacia terebinthus</i> L. subsp. <i>terebinthus</i>	Perennial	Medit. El.	Loc 32a	300
Ph	<i>Rhus coriaria</i> L.	Perennial		Loc 4	350
Apiaceae					
Th	<i>Ammi visnaga</i> (L.) Lam.	Perennial	Medit. El.	Loc 8b	250
H	<i>Berula erecta</i> (Huds.) Coville	Perennial		Loc 6e	350
Th	<i>Bifora radians</i> Bieb.	Annual		Loc 6h	550
Th	<i>Caucalis platycarpus</i> L.	Annual		Loc 17a	250
Th	<i>Daucus guttatus</i> Sm.	Annual		Loc 3	300
H	<i>Eryngium campestre</i> L. var. <i>virens</i>	Perennial		Widespread	Loc 29e
H	<i>Ferulago confusa</i> Velen.	Perennial	Euro-Sib. El.	Loc 29e	300
Th	<i>Orlaya daucooides</i> (L.) Greuter	Annual		Loc 5a	750
Th	<i>Scandix pecten-veneris</i> L.	Annual		Widespread	Loc 29f
Th	<i>Torilis japonica</i> (Houtt.) DC.	Annual		Loc 2b	350
Aquifoliaceae					
Ph	<i>Ilex colchica</i> Poj.	Perennial	Euxine El.	Loc 15a	780
Araliaceae					
Ph	<i>Hedera helix</i> L.	Perennial		Loc 5a	780

Appendix 1. Contd.

Aristolochiaceae						
H	<i>Aristolochia pontica</i> Lam.	Perennial	Euxine El.		Loc 6c	300
Asteraceae						
H	<i>Achillea bierberstenii</i> Afan.	Perennial	Ir.-Tur. El.	Widespread	Loc 19b	850
H	<i>Anthemis aciphylla</i> Boiss. var. <i>discoidea</i> Boiss.	Perennial			Loc 24a	350
Th	<i>Anthemis austriaca</i> Jacq.	Annual		Widespread	Loc 6h	550
H	<i>Anthemis cretica</i> L. subsp. <i>tenuiloba</i> (DC.) Grierson	Perennial			Loc 30d	350
H	<i>Anthemis tinctoria</i> L. var. <i>tinctoria</i>	Perennial			Loc 31	300
H	<i>Arctium minus</i> (Hill.) Bernh. subsp. <i>pubens</i> (Bab.) Arenes	Biennial			Loc 21	800
H	<i>Bellis perennis</i> L.	Perennial	Euro-Sib. El.		Loc 30d	300
Th	<i>Bombycilaena erecta</i> (L.) Smolj.	Annual			Loc 6b	300
Th	<i>Calendula arvensis</i> L.	Annual			Loc 6e	350
H	<i>Carduus nutans</i> L.	Biennial			Loc 6c	300
Th	<i>Carduus pycnocephalus</i> L.	Annual			Loc 6e	350
H	<i>Centaurea diffusa</i> Lam.	Biennial	Medit. El.	Widespread	Loc 17c	300
H	<i>Centaurea iberica</i> Trev. ex. Sprengel	Biennial		Widespread	Loc 1a	300
Th	<i>Centaurea solstitialis</i> L. subsp. <i>solstitialis</i>	Annual		Widespread	Loc 4	300
H	<i>Cichorium intybus</i> L.	Perennial		Widespread	Loc 16	300
H	<i>Cirsium arvense</i> (L.) Scop.	Perennial			Loc 19b	550
	subsp. <i>vestitum</i> (Wimmer and Grab.) Petrak.					
H	<i>Cirsium canum</i> (L.) All.	Perennial	Euro-Sib. El.		Loc 6b	300
H	<i>Cirsium hypoleucum</i> DC.	Perennial	Euxine El.		Loc 30d	300
Th	<i>Conyza canadensis</i> (L.) Cronquist	Annual			Loc 19b	550
H	<i>Crepis macropus</i> Boiss. and Heldr.	Perennial	Ir.-Tur. El.	Endemic	Loc 30m	750
Th	<i>Crepis pulchra</i> L. subsp. <i>pulchra</i>	Annual		Widespread	Loc 11	300
Th	<i>Crupina crupinastrum</i> (Moris) Vis.	Annual		Widespread	Loc 30a	300
G	<i>Doronicum orientale</i> Hoffm.	Perennial			Loc 8c	780
H	<i>Echinops ritro</i> L.	Perennial			Loc 16	300
H	<i>Eupatorium cannabinum</i> L.	Perennial	Euro-Sib. El.		Loc 8g	750
Th	<i>Filago vulgaris</i> Lam.	Annual			Loc 30d	300
Th	<i>Gnaphalium sylvaticum</i> L.	Annual			Loc 8h	550
G	<i>Inula salicina</i> L.	Perennial	Euro-Sib. El.	Widespread	Loc 30c	540
H	<i>Lapsana communis</i> L. subsp. <i>intermedia</i> (Bieb.) Hayek	Biennial		Widespread	Loc 6c	300
G	<i>Leontodon tuberosus</i> L.	Perennial	Medit. El.		Loc 6g	350
Th	<i>Logfia arvensis</i> (L.) Holub	Annual		Widespread	Loc 12g	250

Appendix 1. Contd.

Th	<i>Matricaria chamomilla</i> L.	Annual			Loc 15c	280
G	<i>Mycelis muralis</i> (L.) Dumort.	Perennial	Euro-Sib. El.		Loc 22b	550
Th	<i>Pallenis spinosa</i> (L.) Cass.	Annual			Loc 17c	250
G	<i>Petasites hybridus</i> (L.) Gaertner	Perennial	Euro-Sib. El.		Loc 6c	300
Th	<i>Picnomon acarna</i> (L.) Cass.	Annual	Medit. El.	Widespread	Loc 17c	250
Th	<i>Picris hieracioides</i> L.	Annual	Euro-Sib. El.		Loc 22a	300
H	<i>Scariola viminea</i> (L.) F.W. Schmidt	Biennial		Widespread	Loc 15c	300
Th	<i>Senecio vernalis</i> Waldst. and Kit.	Annual		Widespread	Loc 30n	550
Th	<i>Senecio vulgaris</i> L.	Annual			Loc 6c	300
H	<i>Solidago virgaurea</i> L. subsp. <i>virgaurea</i>	Perennial			Loc 6c	350
Th	<i>Sonchus asper</i> (L.) Hill subsp. <i>glaucescens</i> (Jordan) Ball	Annual		Widespread	Loc 30d	300
Th	<i>Sonchus oleraceus</i> L.	Annual			Loc 30b	700
G	<i>Steptorhamphus tuberosus</i> (Jacq.) Grossh.	Perennial		Widespread	Loc 10b	300
H	<i>Tanacetum parthenium</i> (L.) Schultz-Bip.	Perennial		Widespread	Loc 20a	250
H	<i>Tanacetum vulgare</i> L.	Perennial		Widespread	Loc 7g	750
Ch	<i>Taraxacum officinale</i> Weber	Perennial			Loc 17c	250
H	<i>Tragopogon longirostris</i> Bisch. ex. Schultz	Biennial			Loc 17c	250
G	<i>Tussilago farfara</i> L.	Perennial	Euro-Sib. El.	Widespread	Loc 12b	350
Th	<i>Xeranthemum annuum</i> L.	Annual		Widespread	Loc 15c	300
Betulaceae						
Ph	<i>Alnus glutinosa</i> (L.) Gaertner	Perennial			Loc 12a	350
Boraginaceae						
H	<i>Alkanna tinctoria</i> (L.) Tausch subsp. <i>tinctoria</i>	Perennial	Medit. El.		Loc 15c	250
H	<i>Anchusa azurea</i> Miller var. <i>azurea</i>	Perennial			Loc 30d	300
H	<i>Anchusa officinalis</i> L.	Perennial			Loc 1a	350
H	<i>Cerinthe minor</i> L. subsp. <i>auriculata</i> (Ten) Domac	Perennial	Euro-Sib. El.		Loc 15c	300
H	<i>Cynoglossum creticum</i> Miller	Biennial			Loc 18a	300
H	<i>Echium plantagineum</i> L.	Biennial			Loc 6g	350
Th	<i>Echium vulgare</i> L.	Annual	Euro-Sib. El.		Loc 30e	350
G	<i>Lithospermum purpureocaeruleum</i> L.	Perennial	Euro-Sib. El.		Loc 30g	350
Th	<i>Myosotis ramosissima</i> Rochel ex. Schultes subsp. <i>ramosissima</i>	Annual			Loc 30f	350
Th	<i>Myosotis sicula</i> Guss.	Annual			Loc 1a	350
H	<i>Symphytum orientale</i> L.	Perennial			Loc 1c	350
G	<i>Trachystemon orientalis</i> (L.) G. Don	Perennial	Euxine El.		Loc 7c	550

Appendix 1. Contd.

Brassicaceae							
H	<i>Alliaria petiolata</i> (Bieb.) Cavara and Grande	Biennial			Loc 6c	300	
H	<i>Alyssum condensatum</i> Boiss. and Hausskn. subsp. <i>condensatum</i>	Perennial		Widespread	Loc 12a	350	
Th	<i>Alyssum strigosum</i> Banks and Sol. subsp. <i>strigosum</i>	Annual		Widespread	Loc 15c	300	
H	<i>Arabis sagittata</i> (Bertol) DC.	Biennial			Loc 26a	350	
H	<i>Arabis caucasica</i> Willd. subsp. <i>caucasica</i>	Perennial			Loc 10a	350	
H	<i>Brassica elongata</i> Ehrh.	Biennial			Loc 12d	350	
Th	<i>Brassica nigra</i> (L.) Koch	Annual			Loc 6c	300	
Th	<i>Calepina irregularis</i> (Asso.) Thellung	Annual			Loc 7a	750	
Th	<i>Capsella bursa-pastoris</i> (L.) Medik.	Annual		Widespread	Loc 30g	300	
H	<i>Cardaria draba</i> (L.) Desv.	Perennial			Loc 30e	350	
Th	<i>Cardamine hirsuta</i> L.	Annual		Cosmopolitan	Loc 2a	350	
H	<i>Cardamine quinquefolia</i> (Bieb.) Schmalh.	Perennial	Euro-Sib. El.		Loc 7g	750	
H	<i>Cardamine tenera</i> Gmel.	Perennial			Loc 7g	750	
H	<i>Fibigia eriocarpa</i> (DC.) Boiss.	Perennial		Widespread	Loc 17c	250	
G	<i>Nasturtium officinale</i> R.Br.	Perennial		Widespread	Loc 30f	350	
Th	<i>Rapistrum rugosum</i> (L.) All.	Annual			Loc 30d	300	
Th	<i>Raphanus raphanistrum</i> L.	Annual			Loc 6d	350	
Th	<i>Sinapis arvensis</i> L.	Annual		Widespread	Loc 30d	200	
Th	<i>Sisymbrium officinale</i> (L.) Scop.	Annual		Widespread	Loc 6d	350	
Th	<i>Thlaspi</i> cf. <i>arvense</i> L.	Annual			Loc 6h	550	
Th	<i>Thlaspi perfoliatum</i> L.	Annual		Widespread	Loc 30n	550	
Buxaceae							
Ph	<i>Buxus sempervirens</i> L.	Perennial	Euro-Sib. El.		Loc 2b	300	
Campanulaceae							
H	<i>Campanula glomerata</i> L. subsp. <i>hispida</i> (Witasek) Hayek	Perennial	Euro-Sib. El.		Loc 7c	550	
H	<i>Campanula lyrata</i> Lam. subsp. <i>lyrata</i>	Perennial		Widespread	Endemic	Loc 7e	350
H	<i>Campanula rapunculoides</i> L.	Perennial			Loc 8a	280	
Th	<i>Legousia falcata</i> (Ten) Fritsch.	Annual	Medit. El.		Loc 30e	300	
Th	<i>Legousia speculum-veneris</i> (L.) Chaix	Annual	Medit. El.	Widespread	Loc 30n	550	
Caprifoliaceae							
Ph	<i>Lonicera etrusca</i> Santi var. <i>etrusca</i>	Perennial	Medit. El.		Loc 10b	350	
Ph	<i>Sambucus ebulus</i> L.	Perennial	Euro-Sib. El.		Loc 6i	350	

Appendix 1. Contd.

Ph	<i>Sambucus nigra</i> L.	Perennial	Euro-Sib. El.		Loc 18a	280
Caryophyllaceae						
Th	<i>Agrostemma githago</i> L.	Annual			Loc 30n	550
Th	<i>Arenaria leptoclados</i> (Reichb.) Guss.	Annual			Loc 6c	350
Th	<i>Cerastium glomeratum</i> Thuill.	Annual		Cosmopolitan	Loc 30h	300
H	<i>Dianthus giganteus</i> d'Urv.	Perennial	Euro-Sib. El.		Loc 1a	300
Th	<i>Holosteum umbellatum</i> L.	Annual			Loc 30i	350
H	<i>Minuartia hybrida</i> (Vill.) Schischk subsp. <i>hybrida</i>	Perennial			Loc 6c	300
Th	<i>Moehringia trinervia</i> (L.) Clairv.	Annual			Loc 7c	540
Th	<i>Moenchia mantica</i> (L.) Bartl. subsp. <i>mantica</i>	Annual			Loc 30f	350
Th	<i>Petrorhagia alpina</i> (Habl.) Ball and Heywood subsp. <i>olympica</i> (Boiss.) Ball. and Heywood	Annual			Loc 30d	350
Th	<i>Petrorhagia prolifera</i> (L.) Ball and Heywood	Annual			Loc 10b	300
H	<i>Silene alba</i> (Miller) Krause	Perennial			Loc 10b	300
H	<i>Silene compacta</i> Fischer	Biennial			Loc 18a	300
Th	<i>Silene dichotoma</i> Ehrh. subsp. <i>sibthorpiana</i> (Reichb.) Rech.	Annual			Loc 18a	300
Th	<i>Silene gallica</i> L.	Annual		Cosmopolitan	Loc 6c	300
H	<i>Silene italica</i> (L.) Pers.	Perennial			Loc 12a	300
H	<i>Silene vulgaris</i> (Moench.) Garcke var. <i>vulgaris</i>	Perennial			Loc 6h	500
Ch	<i>Stellaria holostea</i> L.	Perennial	Euro-Sib. El.		Loc 30n	500
Th	<i>Stellaria media</i> (L.) Vill. subsp. <i>media</i>	Annual			Loc 30d	300
Cistaceae						
Ph	<i>Cistus creticus</i> L.	Perennial	Medit. El.		Loc 30i	300
Ph	<i>Cistus salviifolius</i> L.	Perennial			Loc 30d	300
Th	<i>Helianthemum salicifolium</i> (L.) Miller	Annual		Widespread	Loc 6c	300
Chenopodiaceae						
Th	<i>Chenopodium album</i> L. subsp. <i>album</i> var. <i>album</i>	Annual			Loc 24a	350
Convolvulaceae						
H	<i>Calystegia sylvatica</i> (Kit.) Griseb.	Perennial			Loc 8f	300
H	<i>Convolvulus arvensis</i> L.	Perennial			Loc 8c	700
H	<i>Convolvulus cantabrica</i> L.	Perennial			Loc 8f	250

Appendix 1. Contd.

Cornaceae						
Ph	<i>Cornus mas</i> L.	Perennial			Loc 6c	300
Corylaceae						
Ph	<i>Carpinus betulus</i> L.	Perennial	Euro-Sib. El.		Loc 6c	300
Ph	<i>Corylus avellana</i> L. var. <i>avellana</i>	Perennial	Euro-Sib. El.		Loc 6c	300
Ph	<i>Corylus maxima</i> Miller	Perennial	Euro-Sib. El.		Loc 8f	250
Crassulaceae						
Ch	<i>Sedum pallidum</i> Bieb. var. <i>bithynicum</i> (Boiss.) Chamberlain	Perennial	Euxine El.		Loc 30e	350
Th	<i>Sedum pallidum</i> Bieb. var. <i>pallidum</i>	Annual			Loc 30e	350
Ch	<i>Sedum sediforme</i> (Jacq.) Pau.	Perennial	Medit. El.		Loc 18a	250
Ch	<i>Umbilicus erectus</i> DC.	Perennial			Loc 18a	250
Dipsacaceae						
Th	<i>Knautia orientalis</i> L.	Annual	Medit. El.		Loc 6d	350
Th	<i>Ptercephalus plumosus</i> (L.) Coulter	Annual		Widespread	Loc 6d	350
H	<i>Scabiosa columbaria</i> L. subsp. <i>columbaria</i> var. <i>columbaria</i>	Perennial			Loc 6c	300
Ebenaceae						
Ph	<i>Diospyros kaki</i> L.	Perennial			Loc 18a	250
Ericaceae						
Ph	<i>Arbutus andrachne</i> L.	Perennial			Loc 12c	350
Ph	<i>Arbutus unedo</i> L.	Perennial			Loc 12c	350
Ph	<i>Erica arborea</i> L.	Perennial			Loc 12c	350
Ph	<i>Rhododendron ponticum</i> L. subsp. <i>ponticum</i>	Perennial	Euxine El.		Loc 7c	550
Ph	<i>Vaccinium arctostaphylos</i> L.	Perennial	Euxine El.		Loc 7c	550
Euphorbiaceae						
Ch	<i>Euphorbia amygdaloides</i> L. var. <i>amygdaloides</i>	Perennial	Euro-Sib. El.		Loc 17c	250
Th	<i>Euphorbia helioscopia</i> L.	Annual			Loc 30e	350
Th	<i>Euphorbia peplus</i> L.	Annual			Loc 18a	250
H	<i>Euphorbia seguieriana</i> Necker subsp. <i>niciciana</i> (Borbás ex Novák) Rech. fil.	Perennial			Loc 17c	280
Th	<i>Euphorbia stricta</i> L.	Annual	Euro-Sib. El.		Loc 30e	350

Appendix 1. Contd.

Th	<i>Mercurialis annua</i> L.	Annual			Loc 6d	350
Fabaceae						
Ph	<i>Calicotome villosa</i> (Poiret) Link.	Perennial	Medit. El.		Loc 18a	280
H	<i>Coronilla varia</i> L.	Perennial		Widespread	Loc 30i	250
Ph	<i>Cercis siliquastrum</i> L. var. <i>siliquastrum</i>	Perennial			Loc 10b	300
Ch	<i>Chamaecytisus hirsutus</i> (L.) Link	Perennial			Loc 12b	350
H	<i>Dorycnium graecum</i> (L.) Ser.	Perennial	Euxine El.		Loc 12d	350
H	<i>Dorycnium pentaphyllum</i> Scop. subsp. <i>anatolicum</i> (Boiss.) Gams.	Perennial			Loc 12b	350
Ch	<i>Genista tinctoria</i> L.	Perennial	Euro-Sib. El.		Loc 30g	350
Th	<i>Hymenocarpus circinnatus</i> (L.) Savi	Annual	Medit. El.		Loc 30d	350
Th	<i>Lathyrus aphaca</i> L. var. <i>aphaca</i>	Annual			Loc 12f	550
Th	<i>Lathyrus aphaca</i> L. var. <i>biflorus</i> Post	Annual		Widespread	Loc 30f	350
H	<i>Lathyrus aureus</i> (Stev.) Brandza	Perennial	Euxine El.		Loc 6i	360
Th	<i>Lathyrus bithynicus</i> L.	Annual			Loc 6h	560
Th	<i>Lathyrus clymenum</i> L.	Annual	Medit. El.		Loc 5b	560
H	<i>Lathyrus digitatus</i> (Bieb.) Fiori	Perennial	E. Medit. El.		Loc 30f	300
Th	<i>Lathyrus inconspicuus</i> L.	Annual		Widespread	Loc 5b	560
H	<i>Lathyrus laxiflorus</i> (Desf.) Kuntze subsp. <i>laxiflorus</i>	Perennial			Loc 30d	300
Th	<i>Lathyrus nissolia</i> L.	Annual		Widespread	Loc 17c	250
H	<i>Lathyrus palustris</i> L. subsp. <i>palustris</i>	Perennial			Loc 17c	250
Th	<i>Lathyrus cf. setifolius</i> L.	Annual	Medit. El.		Loc 6g	300
H	<i>Lathyrus undulatus</i> Boiss.	Perennial	Euro-Sib. El.	Endemic	Loc 6g	350
H	<i>Lotus corniculatus</i> L. subsp. <i>corniculatus</i>	Perennial		Widespread	Loc 24a	450
Th	<i>Lupinus angustifolius</i> L. subsp. <i>angustifolius</i>	Annual			Loc 10b	250
Th	<i>Medicago arabica</i> (L.) Huds.	Annual			Loc 6k	360
Th	<i>Medicago minima</i> (L.) Bart. var. <i>minima</i>	Annual		Widespread	Loc 6g	280
Th	<i>Medicago orbicularis</i> (L.) Bart.	Annual			Loc 7a	700
Th	<i>Medicago polymorpha</i> L. var. <i>vulgaris</i> (Benth.) Shinnery	Annual		Widespread	Loc 6g	250
Th	<i>Mellilotus officinalis</i> (L.) Desr.	Annual		Widespread	Loc 30i	300
H	<i>Ononis pusilla</i> L.	Perennial	Medit. El.		Loc 10c	250
Th	<i>Ornithopus compressus</i> L.	Annual	Medit. El.		Loc 12e	350
Th	<i>Pisum sativum</i> L.	Annual			Loc 17c	250
H	<i>Psoralea bituminosa</i> L.	Annual	Medit. El.		Loc 17c	250
Th	<i>Securigera securidaca</i> (L.) Degen and Dörf.	Annual			Loc 18b	280
G	<i>Sophora alopecuroides</i> L.	Perennial	Medit. El.		Loc 30r	360

Appendix 1. Contd.

Ph	<i>Spartium junceum</i> L.	Perennial	Medit. El.		Loc 18a	250
Th	<i>Trifolium arvense</i> L. var. <i>arvense</i>	Annual		Widespread	Loc 30d	300
Th	<i>Trifolium campestre</i> Schreb.	Annual		Widespread	Loc 6c	300
Th	<i>Trifolium echinatum</i> Bieb.	Annual	E. Medit. El.		Loc 6h	550
Th	<i>Trifolium constantinopolitanum</i> Ser.	Annual		Widespread	Loc 30d	300
Th	<i>Trifolium hirtum</i> All.	Annual		Widespread	Loc 10b	300
H	<i>Trifolium hybridum</i> L. var. <i>hybridum</i>	Perennial	Medit. El.		Loc 30d	550
Th	<i>Trifolium lappaceum</i> L.	Annual	Medit. El.		Loc 6h	550
H	<i>Trifolium pratense</i> L. var. <i>pratense</i>	Perennial		Widespread	Loc 7h	800
Th	<i>Trifolium purpureum</i> Lois. var. <i>purpureum</i>	Annual		Widespread	Loc 12b	350
H	<i>Trifolium repens</i> L. var. <i>repens</i>	Perennial		Widespread	Loc 12b	350
Th	<i>Trifolium resupinatum</i> L. var. <i>resupinatum</i>	Annual			Loc 6c	300
Th	<i>Trifolium scabrum</i> L.	Annual		Widespread	Loc 12a	280
Th	<i>Trifolium stellatum</i> L. var. <i>stellatum</i>	Annual			Loc 12d	350
Th	<i>Trifolium subterraneum</i> L.	Annual			Loc 12a	300
H	<i>Vicia cracca</i> L. subsp. <i>cracca</i>	Perennial	Euro-Sib. El.		Loc 12a	300
Th	<i>Vicia hirsuta</i> (L.) S.F.Gray	Annual			Loc 12a	280
Th	<i>Vicia hybrida</i> L.	Annual		Widespread	Loc 12a	280
Th	<i>Vicia laxiflora</i> Brot.	Annual	Medit. El.		Loc 12d	350
Th	<i>Vicia lutea</i> L. var. <i>lutea</i>	Annual			Loc 7a	700
Th	<i>Vicia meyeri</i> Boiss.	Annual	Euxine El.		Loc 6d	350
Th	<i>Vicia sativa</i> L. subsp. <i>nigra</i> (L.) Ehrh. var. <i>segetalis</i> (Thuill) Ser. ex DC.	Annual		Widespread	Loc 12a	280
Th	<i>Vicia sativa</i> L. subsp. <i>sativa</i>	Annual		Cosmopolitan	Loc 12a	280
Th	<i>Vicia villosa</i> Roth. subsp. <i>villosa</i>	Annual		Widespread	Loc 30c	550
Fagaceae						
Ph	<i>Castanea sativa</i> Miller.	Perennial	Euro-Sib. El.		Loc 7c	550
Ph	<i>Fagus orientalis</i> Lipsky	Perennial	Euro-Sib. El.		Loc 7g	800
Ph	<i>Quercus cerris</i> L. var. <i>cerris</i>	Perennial	Medit. El.		Loc 6g	350
Ph	<i>Quercus coccifera</i> L.	Perennial	Medit. El.		Loc 17c	250
Ph	<i>Quercus frainetto</i> Ten.	Perennial	Euro-Sib. El.		Loc 6c	280
Ph	<i>Quercus hartwissiana</i> Steven	Perennial			Loc 12b	350
Ph	<i>Quercus ilex</i> L.	Perennial	Medit. El.		Loc 7c	500
Ph	<i>Quercus petraea</i> (Mattschka) Liebl. subsp. <i>iberica</i> (Steven ex Bieb.) Krassiln.	Perennial			Loc 6c	350

Appendix 1. Contd.

Ph	<i>Quercus pubescens</i> Willd.	Perennial		Loc 12a	300
Ph	<i>Quercus robur</i> L.	Perennial		Loc 12b	350
Gentianaceae					
H	<i>Centaurium erythraea</i> Rafn. subsp. <i>erythraea</i>	Perennial	Euro-Sib. El.	Loc 7c	550
Geraniaceae					
Th	<i>Erodium cicutarium</i> (L.) Herit subsp. <i>cutarium</i>	Annual		Loc 12a	300
H	<i>Geranium asphodeloides</i> Burnm. fil. subsp. <i>asphodeloides</i>	Perennial	Euro-Sib. El.	Loc 30g	300
Th	<i>Geranium dissectum</i> L.	Annual		Loc 29f	550
Th	<i>Geranium molle</i> L. subsp. <i>molle</i>	Annual		Loc 12b	350
Th	<i>Geranium purpureum</i> Vill.	Annual		Loc 6c	300
Th	<i>Geranium robertianum</i> L.	Annual		Loc 30b	750
Th	<i>Geranium rotundifolium</i> L.	Annual		Loc 20a	300
Hypericaceae					
H	<i>Hypericum bithynicum</i> Boiss.	Perennial	Euxine El.	Loc 12b	350
Ch	<i>Hypericum calycinum</i> L.	Perennial	Euxine El.	Loc 7a	700
H	<i>Hypericum cerastoides</i> (Spach.) Robson	Perennial		Loc 6c	300
H	<i>Hypericum montbretii</i> Spach.	Perennial		Loc 6g	350
H	<i>Hypericum perforatum</i> L.	Perennial		Loc 7h	800
Illecebraceae					
Th	<i>Scleranthus annuus</i> L. subsp. <i>annuus</i>	Annual		Widespread	Loc 30e
H	<i>Scleranthus perennis</i> L. subsp. <i>marginatus</i> (Guss.) Arc.	Perennial			Loc 7g
Juglandaceae					
Ph	<i>Juglans regia</i> L.	Perennial		Loc 30r	360
Lamiaceae					
H	<i>Acinos arvensis</i> (Lam.) Dandy.	Perennial		Loc 7d	300
Th	<i>Acinos rotundifolius</i> Pers.	Annual		Widespread	Loc 12b
Th	<i>Ajuga chamaepitys</i> (L.) Schreber subsp. <i>chia</i> Arcangeli var. <i>chia</i>	Annual		Widespread	Loc 30d
H	<i>Calamintha nepeta</i> (L.) Savi subsp. <i>glandulosa</i> (Req.) P. W. Ball.	Perennial		Loc 17c	250
H	<i>Clinopodium vulgare</i> L.	Perennial		Loc 7g	800
Th	<i>Lamium amplexicaule</i> L.	Annual	Euro-Sib. El.	Widespread	Loc 7i

Appendix 1. Contd.

H	<i>Lamium maculatum</i> L. var. <i>maculatum</i>	Perennial	Euro-Sib. El.	Widespread	Loc 7a	700
Th	<i>Lamium purpureum</i> L.	Annual			Loc 7i	560
H	<i>Melittis melissophyllum</i> L. subsp. <i>albida</i> (Guss.) P.W.Ball.	Perennial	E. Medit. El.		Loc 7g	800
G	<i>Mentha pulegium</i> L.	Perennial	Medit. El.		Loc 30c	550
H	<i>Micromeria juliana</i> (L.) Benth. ex Reichb.	Perennial	Medit. El.		Loc 17c	250
H	<i>Micromeria myrtifolia</i> Boiss. & Hohen	Perennial	E. Medit. El.		Loc 26b	250
H	<i>Origanum vulgare</i> L. subsp. <i>hirtum</i> (Link.) Letswaart	Perennial	E. Medit. El.		Loc 10b	250
H	<i>Prunella vulgaris</i> L.	Perennial	Euro-Sib. El.	Widespread	Loc 7c	550
H	<i>Salvia argentea</i> L.	Perennial	Medit. El.		Loc 7c	550
H	<i>Salvia virgata</i> Jacq.	Perennial	Ir.-Tur. El.		Loc 12a	300
H	<i>Scutellaria albida</i> L. subsp. <i>albida</i>	Perennial	E. Medit. El.		Loc 10b	250
Th	<i>Stachys annua</i> (L.) L. subsp. <i>annua</i> var. <i>annua</i>	Annual		Widespread	Loc 29c	300
H	<i>Stachys byzantina</i> C. Koch	Perennial	Euro-Sib. El.		Loc 7c	550
H	<i>Stachys sylvatica</i> L.	Perennial	Euro-Sib. El.		Loc 21	550
Ch	<i>Teucrium chamaedrys</i> L. subsp. <i>chamaedrys</i>	Perennial			Loc 17c	250
H	<i>Teucrium polium</i> L.	Perennial		Widespread	Loc 17c	250
Lauraceae						
Ph	<i>Laurus nobilis</i> L.	Perennial	Medit. El.		Loc 12c	350
Linaceae						
Th	<i>Linum bienne</i> Miller.	Annual	Medit. El.		Loc 12b	350
Loranthaceae						
Ph	<i>Viscum album</i> L. subsp. <i>album</i>	Perennial			Loc 26c	700
Lythraceae						
H	<i>Lhytrum salicaria</i> L.	Perennial	Euro-Sib. El.	Widespread	Loc 7c	550
Malvaceae						
H	<i>Alcea pallida</i> Waldst et Kit.	Perennial			Loc 6d	350
H	<i>Malva sylvestris</i> L.	Perennial			Loc 14a	300
Moraceae						
Ph	<i>Ficus carica</i> L. subsp. <i>carica</i>	Perennial		Widespread	Loc 14f	250
Ph	<i>Morus alba</i> L.	Perennial			Loc 14f	250

Appendix 1. Contd.

Ph	<i>Morus nigra</i> L.	Perennial		Widespread	Loc 14f	250
Oleaceae						
Ph	<i>Fraxinus ornus</i> L. subsp. <i>ornus</i>	Perennial			Loc 30e	300
Ph	<i>Jasminum fruticans</i> L.	Perennial	Medit. El.		Loc 15c	250
Ph	<i>Ligustrum vulgare</i> L.	Perennial	Euro-Sib. El.		Loc 30d	300
Ph	<i>Olea europaea</i> L. var. <i>europaea</i>	Perennial			Loc 17c	250
Ph	<i>Phillyrea latifolia</i> L.	Perennial	Medit. El.		Loc 17a	300
Onagraceae						
G	<i>Circaea lutetiana</i> L.	Perennial			Loc 7c	540
H	<i>Epilobium angustifolium</i> L.	Perennial		Widespread	Loc 19b	550
H	<i>Epilobium hirsutum</i> L.	Perennial			Loc 26b	250
H	<i>Epilobium montanum</i> L.	Perennial	Euro-Sib. El.		Loc 7c	550
Orobanchaceae						
G	<i>Orobanche caryophyllacea</i> Smith.	Perennial			Loc 20a	300
G	<i>Orobanche minor</i> Sm.	Perennial			Loc 17e	560
Oxalidaceae						
Th	<i>Oxalis corniculata</i> L.	Annual		Cosmopolitan	Loc 30d	300
Papaveraceae						
H	<i>Chelidonium majus</i> L.	Perennial	Euro-Sib. El.		Loc 17b	750
Th	<i>Fumaria officinalis</i> L.	Annual			Loc 18b	300
Th	<i>Papaver dubium</i> L.	Annual			Loc 30n	560
Th	<i>Papaver rhoeas</i> L.	Annual		Widespread	Loc 30n	560
Phytolaccaceae						
H	<i>Phytolacca americana</i> L.	Perennial			Loc 8g	750
Plantaginaceae						
H	<i>Plantago coronopus</i> L. subsp. <i>coronopus</i>	Perennial			Loc 26b	250
H	<i>Plantago lanceolata</i> L.	Perennial			Loc 7d	300
H	<i>Plantago major</i> L.	Perennial			Loc 18b	250

Appendix 1. contd.

Platanaceae						
Ph	<i>Platanus orientalis</i> L.	Perennial		Widespread	Loc 30b	700
Polygalaceae						
H	<i>Polygala supina</i> Schreb.	Perennial		Widespread	Loc 27c	560
H	<i>Polygala vulgaris</i> L.	Perennial	Euro-Sib. El.		Loc 27a	550
Polygonaceae						
Th	<i>Polygonum aviculare</i> L.	Annual		Cosmopolitan	Loc 17d	250
Th	<i>Polygonum lapathifolium</i> L.	Annual			Loc 6d	350
G	<i>Rumex acetosella</i> L.	Perennial		Cosmopolitan	Loc 6c	300
H	<i>Rumex conglomeratus</i> Murray	Perennial			Loc 7i	560
H	<i>Rumex crispus</i> L.	Perennial			Loc 9	350
H	<i>Rumex pulcher</i> L.	Perennial			Loc 6d	300
G	<i>Rumex cf. tuberosus</i> L.	Perennial			Loc 6c	300
Primulaceae						
Th	<i>Anagallis arvensis</i> L. var. <i>arvensis</i>	Annual			Loc 6c	300
G	<i>Cyclamen coum</i> Miller var. <i>coum</i>	Perennial			Loc 24b	250
H	<i>Lysimachia verticillaris</i> Sprengel	Perennial	Euxine El.		Loc 22c	550
H	<i>Primula vulgaris</i> Huds. subsp. <i>sibthorpii</i> (Hoffm.) W.W. Sm. and Forrest	Perennial	Euxine El.		Loc 30d	300
Ranunculaceae						
Ph	<i>Clematis vitalba</i> L.	Perennial			Loc 30d	300
Th	<i>Delphinium peregrinum</i> L.	Annual			Loc 17c	350
H	<i>Helleborus orientalis</i> Lam.	Perennial	Euxine El.		Loc 7h	860
Th	<i>Nigella damascena</i> L.	Annual			Loc 17c	300
H	<i>Ranunculus constantinopolitanus</i> (DC.) d'Urv.	Perennial		Widespread	Loc 6c	280
G	<i>Ranunculus ficaria</i> L. subsp. <i>ficariiformis</i> Rovy. and Fouc.	Perennial		Widespread	Loc 30m	700
Th	<i>Ranunculus marginatus</i> (DC.) d'Urv. var. <i>marginatus</i>	Annual			Loc 6e	280
Th	<i>Ranunculus marginatus</i> (DC.) d'Urv. var. <i>trachycarpus</i> (Fischer and C.A. Mey.) Azn.	Annual			Loc 6c	280
H	<i>Ranunculus neapolitanus</i> Ten.	Perennial			Loc 7e	350
H	<i>Ranunculus velutinus</i> Ten.	Perennial			Loc 7i	560
G	<i>Thalictrum flavum</i> L.	Perennial			Loc 12g	280

Appendix 1. contd.

Resedaceae						
Th	<i>Reseda lutea</i> L. var. <i>lutea</i>	Annual		Widespread	Loc 6c	280
Rhamnaceae						
Ph	<i>Paliurus spina-christi</i> Miller	Perennial			Loc 29d	350
Ph	<i>Frangula alnus</i> Miller subsp. <i>alnus</i>	Perennial	Euro-Sib. El.		Loc 6c	280
Rosaceae						
H	<i>Agrimonia eupatoria</i> L.	Perennial		Widespread	Loc 17d	250
Ph	<i>Cerasus avium</i> (L.) Moench.	Perennial			Loc 6c	280
Ph	<i>Cotoneaster nummularia</i> Fisch. and Mey.	Perennial			Loc 30e	350
Ph	<i>Crataegus monogyna</i> Jacq. subsp. <i>monogyna</i>	Perennial			Loc 6g	280
Ph	<i>Cydonia oblonga</i> Miller	Perennial			Loc 6g	280
H	<i>Filipendula vulgaris</i> Moench.	Perennial	Euro-Sib. El.		Loc 30d	350
H	<i>Fragaria vesca</i> L.	Perennial			Loc 23	560
H	<i>Geum urbanum</i> L.	Perennial		Widespread	Loc 26b	250
Ph	<i>Laurocerasus officinalis</i> Roemer	Perennial			Loc 30c	550
Ph	<i>Malus sylvestris</i> Miller subsp. <i>orientalis</i> (A. Uglitzkich.) Browicz. var. <i>orientalis</i>	Perennial			Loc 6c	280
Ph	<i>Mespilus germanica</i> L.	Perennial	Euxine El.		Loc 6c	280
H	<i>Potentilla astrocanica</i> Jacq.	Perennial	Euro-Sib. El.		Loc 6c	300
H	<i>Potentilla inclinata</i> Vill.	Perennial			Loc 6c	300
H	<i>Potentilla recta</i> L.	Perennial		Widespread	Loc 6n	300
Ph	<i>Rosa canina</i> L.	Perennial			Loc 29c	280
Ph	<i>Rubus caucasicus</i> Focke	Perennial	Euxine El.		Loc 12g	300
Ph	<i>Rubus discolor</i> Weihe and Nees	Perennial			Loc 7c	550
Ph	<i>Rubus canescens</i> DC. var. <i>canescens</i>	Perennial		Widespread	Loc 20a	280
Ph	<i>Rubus sanctus</i> Schreber	Perennial		Widespread	Loc 6c	300
H	<i>Sanguisorba minor</i> Scop. subsp. <i>muricata</i> (Spach) Briq.	Perennial			Loc 20b	700
Ph	<i>Sorbus aucuparia</i> L.	Perennial	Euro-Sib. El.		Loc 6g	350
Ph	<i>Sorbus torminalis</i> (L.) Crantz var. <i>torminalis</i>	Perennial			Loc 29c	280
Rubiaceae						
H	<i>Asperula involucreta</i> Wahlenb.	Perennial	Euxine El.		Loc 6d	350
G	<i>Asperula taurina</i> L. subsp. <i>taurina</i>	Perennial			Loc 26b	250
H	<i>Asperula tenella</i> Heuffel ex Degen	Perennial			Loc 6g	350
Th	<i>Crucianella latifolia</i> L.	Annual	Medit. El.		Loc 6n	250

Appendix 1. Contd.

Th	<i>Galium aparine</i> L.	Annual			Loc 7i	560
G	<i>Galium rotundifolium</i> L.	Perennial	Euro-Sib. El.		Loc 26b	280
H	<i>Galium verum</i> L. subsp. <i>verum</i>	Perennial	Euro-Sib. El.		Loc 30d	300
H	<i>Rubia tinctorium</i> L.	Perennial	Ir.-Tur. El.	Widespread	Loc 17d	280
Th	<i>Sherardia arvensis</i> L.	Annual			Loc 31	250
Salicaceae						
Ph	<i>Populus tremula</i> L.	Perennial	Euro-Sib. El.	Widespread	Loc 7c	550
Ph	<i>Salix alba</i> L.	Perennial	Euro-Sib. El.	Widespread	Loc 7d	280
Ph	<i>Salix caprea</i> L.	Perennial	Euro-Sib. El.		Loc 7a	700
Santalaceae						
Ph	<i>Osyris alba</i> L.	Perennial	Medit. El.		Loc 6g	350
Saxifragaceae						
Th	<i>Saxifraga cymbalaria</i> L. var. <i>cymbalaria</i>	Annual			Loc 6c	280
G	<i>Saxifraga rotundifolia</i> L.	Perennial	Euro-Sib. El.		Loc 7k	360
Scrophulariaceae						
H	<i>Linaria genistifolia</i> (L.) Miller	Perennial	Euro-Sib. El.		Loc 20a	300
Th	<i>Parentucellia latifolia</i> (L.) Caruel subsp. <i>latifolia</i>	Annual	Medit. El.		Loc 7d	280
H	<i>Scrophularia scopolii</i> (Hoppe ex) Pers.	Perennial			Loc 6k	360
H	<i>Verbascum lasianthum</i> Boiss. ex Bentham	Perennial		Widespread	Loc 7e	350
Th	<i>Veronica anagallis-aquatica</i> L.	Annual			Loc 30d	250
H	<i>Veronica chamaedrys</i> L.	Perennial	Euro-Sib. El.		Loc 6c	280
H	<i>Veronica gentianoides</i> Vahl.	Perennial	Euxine El.		Loc 13	360
H	<i>Veronica montana</i> L.	Perennial	Euro-Sib. El.		Loc 17d	250
Th	<i>Veronica persica</i> Poiret	Annual			Loc 13	360
Th	<i>Veronica polita</i> Fries	Annual		Widespread	Loc 30d	700
H	<i>Veronica serpyllifolia</i> L.	Perennial			Loc 7a	300
Solanaceae						
H	<i>Atropa belladonna</i> L.	Perennial	Euro-Sib. El.		Loc 7h	850
Styracaceae						
Ph	<i>Styrax officinalis</i> L.	Perennial			Loc 17d	250

Appendix 1. Contd.

Thymelaeaceae						
Ph	<i>Daphne pontica</i> L.	Perennial	Euxine El.		Loc 30e	350
Tiliaceae						
Ph	<i>Tilia argentea</i> Desf. ex DC.	Perennial	Euro-Sib. El.		Loc 10a	300
Ulmaceae						
Ph	<i>Celtis australis</i> L.	Perennial	Medit. El.		Loc 7f	350
Ph	<i>Ulmus minor</i> Miller subsp. <i>minor</i>	Perennial			Loc 6d	350
Urticaceae						
Th	<i>Urtica dioica</i> L.	Annual	Euro-Sib. El.	Widespread	Loc 16	350
Th	<i>Urtica pilulifera</i> L.	Annual	Medit. El.		Loc 15c	300
Valerianaceae						
Th	<i>Valerianella turgida</i> (Stev.) Betcke	Annual			Loc 6c	280
Verbenaceae						
H	<i>Verbena officinalis</i> L.	Perennial			Loc 12g	300
Violaceae						
H	<i>Viola alba</i> Besser	Perennial		Widespread	Loc 30n	560
Th	<i>Viola arvensis</i> Murray	Annual			Loc 30d	280
Th	<i>Viola kitaibelliana</i> Roem. and Schult	Annual			Loc 30b	700
H	<i>Viola sieheana</i> Becker	Perennial			Loc 6c	280
Vitaceae						
Ph	<i>Vitis vinifera</i> L.	Perennial			Loc 30d	280
Monocotyledoneae / Liliopsida						
Araceae						
G	<i>Arum maculatum</i> L.	Perennial			Loc 7a	700
Cyperaceae						
G	<i>Carex divulsa</i> Stokes subsp. <i>divulsa</i>	Perennial			Loc 30d	350

Appendix 1. contd.

G	<i>Carex echinata</i> Murray	Perennial	Euro-Sib. El.		Loc 7g	750
G	<i>Carex flacca</i> Schreber subsp. <i>serratula</i> (Biv.) Greuter	Perennial	Medit. El.		Loc 7f	350
G	<i>Carex pendula</i> Hudson	Perennial	Euro-Sib. El.		Loc 7f	350
Dioscoreaceae						
G	<i>Tamus communis</i> L. subsp. <i>communis</i>	Perennial			Loc 7a	700
Iridaceae						
G	<i>Gladiolus italicus</i> Miller	Perennial			Loc 12a	300
G	<i>Iris sintenisii</i> Janka	Perennial	Euro-Sib. El.		Loc 30s	300
Juncaceae						
H	<i>Juncus effusus</i> L.	Perennial		Cosmopolitan	Loc 7g	780
Th	<i>Juncus tenageia</i> Ehrh. ex L. fil.	Annual	Euro-Sib. El.		Loc 17d	250
H	<i>Luzula forsteri</i> (Sm.) DC.	Perennial	Euro-Sib. El.	Widespread	Loc 30g	300
Liliaceae						
G	<i>Allium neopolitanum</i> Cyr.	Perennial	Medit. El.		Loc 17d	250
G	<i>Allium scorodoprasum</i> L. subsp. <i>rotundum</i> (L.) Stearn	Perennial	Medit. El.	Widespread	Loc 29g	380
G	<i>Asparagus acutifolius</i> L.	Perennial	Medit. El.		Loc 17c	200
G	<i>Bellevalia trifoliata</i> (Ten.) Kunth.	Perennial	Medit. El.		Loc 17e	550
G	<i>Fritillaria pontica</i> Wahlenb.	Perennial			Loc 30d	300
G	<i>Gagea bohemica</i> (Zauschn) Schultes and Schultes fil.	Perennial			Loc 28	300
G	<i>Muscari neglectum</i> Guss.	Perennial		Widespread	Loc 27b	300
G	<i>Ornithogalum umbellatum</i> L.	Perennial			Loc 27d	380
G	<i>Ornithogalum sigmoideum</i> Freyn and Sint.	Perennial	Euro-Sib. El.		Loc 27a	560
G	<i>Polygonatum multiflorum</i> (L.) All.	Perennial			Loc 26b	250
G	<i>Ruscus aculeatus</i> L. var. <i>angustifolia</i> Boiss.	Perennial			Loc 12h	350
G	<i>Ruscus hypoglossum</i> L.	Perennial			Loc 30b	750
G	<i>Scilla bifolia</i> L.	Perennial			Loc 29c	300
G	<i>Smilax excelsa</i> L.	Perennial	Euxine El.		Loc 6d	350
Orchidaceae						
G	<i>Cephalanthera epipactoides</i> Fisch. and Mey.	Perennial	E. Medit. El.		Loc 17c	250
G	<i>Platanthera bifolia</i> (L.) L.C.M.	Perennial	Euro-Sib. El.		Loc 26b	250

Appendix 1. contd.

Poaceae						
H	<i>Agrostis capillaris</i> L. var. <i>capillaris</i>	Perennial				Loc 10b 350
Th	<i>Alopecurus myosuroides</i> Hudson var. <i>mysuroides</i>	Annual	Euro-Sib. El.	Widespread		Loc 6c 300
H	<i>Anthoxanthum odoratum</i> L. subsp. <i>odoratum</i>	Perennial	Euro-Sib. El.			Loc 6d 350
Th	<i>Apera spica-venti</i> (L.) P. Beauv.	Annual	Euro-Sib. El.			Loc 7i 560
Th	<i>Avena barbata</i> Pott ex Link subsp. <i>barbata</i>	Annual	Medit. El.	Widespread		Loc 10a 300
Th	<i>Avena sativa</i> L.	Annual				Loc 30n 560
Th	<i>Avena sterilis</i> L.	Annual				Loc 6d 350
Th	<i>Avena wiestii</i> Steudel.	Annual				Loc 12h 300
Th	<i>Briza maxima</i> L.	Annual				Loc 12b 350
Th	<i>Bromus hordeaceus</i> L. subsp. <i>hordeaceus</i>	Annual				Loc 12h 300
Th	<i>Bromus sterilis</i> L.	Annual		Widespread		Loc 7k 300
H	<i>Calamagrostis epigejos</i> (L.) Roth.	Perennial	Euro-Sib. El.			Loc 7c 550
H	<i>Chrysopogon gryllus</i> (L.) Trin. subsp. <i>gryllus</i>	Perennial		Widespread		Loc 17c 250
H	<i>Cynodon dactylon</i> (L.) Pers. var. <i>dactylon</i>	Perennial				Loc 6c 300
Th	<i>Cynosurus echinatus</i> L.	Annual	Medit. El.			Loc 29f 550
H	<i>Dactylis glomerata</i> L. subsp. <i>hispanica</i> (Roth.) Nyman	Perennial	Euro-Sib. El.			Loc 12a 300
H	<i>Festuca arundinacea</i> Schreber subsp. <i>arundinacea</i>	Perennial				Loc 12d 350
H	<i>xFestulolium brinkmanii</i> (A. Braun) Ascherson & Graebner	Perennial				Loc 7h 860
H	<i>Holcus lanatus</i> L.	Perennial	Euro-Sib. El.			Loc 7i 580
Th	<i>Hordeum murinum</i> L. subsp. <i>glaucum</i> (Steudel) Tzvelev	Annual				Loc 7e 350
H	<i>Koeleria cristata</i> (L.) Pers.	Perennial		Widespread		Loc 6m 300
H	<i>Lolium perenne</i> L.	Perennial	Euro-Sib. El.			Loc 30n 560
Th	<i>Lolium rigidum</i> Gaudin var. <i>rigidum</i>	Annual				Loc 12h 280
G	<i>Melica ciliata</i> L. subsp. <i>ciliata</i>	Perennial		Widespread		Loc 26b 250
G	<i>Melica uniflora</i> Retz.	Perennial	Euro-Sib. El.			Loc 10b 300
G	<i>Poa angustifolia</i> L.	Perennial		Widespread		Loc 12h 280
Th	<i>Poa annua</i> L.	Annual		Cosmopolitan		Loc 7i 560
G	<i>Poa bulbosa</i> L.	Perennial				Loc 30c 550
H	<i>Poa nemoralis</i> L.	Perennial		Widespread		Loc 6d 350
G	<i>Poa pratensis</i> L.	Perennial		Widespread		Loc 6c 280
H	<i>Phleum pratense</i> L.	Perennial		Widespread		Loc 7d 300
H	<i>Trisetum flavescens</i> (L.) P. Beauv.	Perennial	Euro-Sib. El.			Loc 7i 580
Th	<i>Vulpia muralis</i> (Kunth) Nees	Annual	Medit. El.			Loc 7b 560

Appendix 2.

DATE	Locality	Locality code
05.05.2006	Yazlik village surroundings	Loc 1a
	Yazlik village center of Kadirga region	Loc 1b
	Yazlik village west of Kadirga region	Loc 1c
11.05.2006	Siyretiye village water reservoir surroundings	Loc 2a
	Yazlik village north-west of Kadirga region	Loc 2b
12.05.2006	Yukari Ulaşli village surroundings	Loc 3
16.05.2006	Yazlik village surroundings	Loc 4
23.05.2006	Sofular village surroundings	Loc 5a
	Icadiye village surroundings	Loc 5b
24.05.2006	Yukari Değirmendere area south of Örcün village	Loc 6a
	Yukari Değirmendere area Findikli region	Loc 6b
	Yazlik village surroundings	Loc 6c
	Yazlik village center of Kadirga region	Loc 6d
	Yazlik village south of Kadirga region	Loc 6e
	Yazlik village west of Kadirga region	Loc 6f
	Yazlik village north of Kadirga region	Loc 6g
	Icadiye village surroundings	Loc 6h
	Siyretiye village water reservoir surroundings	Loc 6i
	Siyretiye village Böcekli region	Loc 6k
	Yazlik village north-west of Kadirga region	Loc 6m
Yukari Ulaşli village surroundings Yalisirti region	Loc 6n	
25.05.2006	Sofular village surroundings	Loc 7a
	Nüzhetiye village surroundings	Loc 7b
	Hamidiye village surroundings	Loc 7c
	Yazlik village surroundings	Loc 7d
	Yazlik village center of Kadirga region	Loc 7e
	Yazlik village north of Kadirga region	Loc 7f
	Ayvazpınar village surroundings	Loc 7g
	Ayvazpınar village fire tower surroundings	Loc 7h
	Icadiye village surroundings	Loc 7i
	Siyretiye village water reservoir surroundings	Loc 7k

Appendix 2. Contd.

	Yukari Değirmendere area south of Örcün village	Loc 8a
	Yukari değirmendere area Findikli region	Loc 8b
	Sofular village surroundings	Loc 8c
26.05.2006	Yazlik village surroundings	Loc 8d
	Yazlik village west of Kadirga region	Loc 8e
	Yukari Ulaşli village surroundings	Loc 8f
	Ayvazpınar village surroundings	Loc 8g
	Irşadiye village Erikli Plateau	Loc 8h
02.06.2006	Yazlik village center of Kadirga region	Loc 9
	Yukari Değirmendere area south of Örcün village	Loc 10a
05.06.2006	Yukari Değirmendere area Findikli region	Loc 10b
	Yukari Ulaşli village surroundings	Loc 10c
06.06.2006	Yukari Değirmendere area Findikli region	Loc 11
	Yazlik village surroundings	Loc 12a
	Yazlik village center of Kadirga region	Loc 12b
	Yazlik village south of Kadirga region	Loc 12c
07.06.2006	Yazlik village north of kadirga region	Loc 12d
	Yazlik village north-west of Kadirga region	Loc 12e
	Icadiye village surroundings	Loc 12f
	West of Ihsaniye village	Loc 12g
	Yazlik village north-west of Kadirga region	Loc 12h
11.06.2006	Siyretiye village water reservoir surroundings	Loc 13
	Sarayli village surroundings	Loc 14a
	Yazlik village surroundings	Loc 14b
12.06.2006	Yazlik village south of Kadirga region	Loc 14c
	Yazlik village west of Kadirga region	Loc 14d
	Yazlik village north of Kadirga region	Loc 14e
	West of Ihsaniye village	Loc 14f
14.06.2006	Sofular village surroundings	Loc 15a

Appendix 2. Contd.

	Yazlik village center of Kadirga region	Loc 15b
	Yukari Ulaşli village surroundings	Loc 15c
16.06.2006	Yazlik village surroundings	Loc 16
	Yukari Değirmendere area Findikli region	Loc 17a
	Sofular village surroundings	Loc 17b
19.06.2006	Yukari Ulaşli village surroundings	Loc 17c
	West of Yukari Ulaşli village surroundings	Loc 17d
	Icadiye village surroundings	Loc 17e
20.06.2006	Yukari Ulaşli village surroundings	Loc 18a
	West of Yukari Ulaşli village surroundings	Loc 18b
21.06.2006	Sofular village surroundings	Loc 19a
	Irşadiye village Erikli Plateau	Loc 19b
26.06.2006	Yukari Değirmendere area south of Örcün village	Loc 20a
	Sofular village surroundings	Loc 20b
29.06.2006	Irşadiye village Erikli plateau	Loc 21
05.07.2006	Yazlik village surroundings	Loc 22a
	Icadiye village surroundings	Loc 22b
	Irşadiye village Erikli plateau	Loc 22c
06.07.2006	Irşadiye village Erikli plateau	Loc 23
12.07.2006	Hisareyn village Panayir region	Loc 24a
	Yukari Ulaşli village surroundings Yalisirti region	Loc 24b
13.07.2006	Yazlik village center of Kadirga region	Loc 25a
	Ayvazpınar village surroundings	Loc 25b
24.07.2006	Yukari Ulaşli village surroundings	Loc 26a
	Yukari Ulaşli village surroundings Yalisirti region	Loc 26b
	Yukari irşadiye village	Loc 26c

Appendix 2. Contd.

23.03.2007	Nüzhetiye village Sakarbiçki region	Loc 27a
	Yazlik village north of KADIRGA region	Loc 27b
	Icadiye village surroundings	Loc 27c
	Siyretiye village Böcekli region	Loc 27d
29.03.2009	Yazlik village surroundings	Loc 28
19.04.2007	Mamuriye village surroundings	Loc 29a
	Nüzhetiye village	Loc 29b
	Yazlik village surroundings	Loc 29c
	Yazlik village center of Kadirga region	Loc 29d
	Yukari Ulaşli village surroundings	Loc 29e
	Icadiye village surroundings	Loc 29f
20.04.2007	Siyretiye village Böcekli region	Loc 29g
	Yukari Değirmendere area south of Örcün village	Loc 30a
	Sofular village surroundings	Loc 30b
	Hamidiye village surroundings	Loc 30c
	Yazlik village surroundings	Loc 30d
	Yazlik village center of Kadirga region	Loc 30e
	Yazlik village west of Kadirga region	Loc 30f
	Yazlik village north of Kadirga region	Loc 30g
	Yazlik village east of Kadirga region	Loc 30h
	Yukari Ulaşli village surroundings	Loc 30i
	Yukari Ulaşli village military zone surroundings	Loc 30k
	Ayvazpınar village surroundings	Loc 30m
	Icadiye village surroundings	Loc 30n
	Irşadiye village Erikli plateau	Loc 30ö
Siyretiye village water reservoir surroundings	Loc 30p	
Siyretiye village Böcekli region	Loc 30r	
Yazlik village north-west of Kadirga region	Loc 30s	
19.05.2007	Yazlik village surroundings	Loc 31
20.05.2007	Yazlik village west of Kadirga region	Loc 32a
	Yukari Ulaşli village surroundings	Loc 32b