

Received : 22.9.1997

**A RESEARCH ON THE FLORA OF UZUNDERE
(KARGAPAZARI MOUNTAINS ERZURUM) AND ITS
SURROUNDINGS**

Abdullah KAYA, Nasip DEMİRKUŞ*

Department of Science Education, Faculty of Education, Yüzüncü Yıl
University, 65080, Van, TURKIYE

Abstract: The field studies have been carried out to determine the flora of Uzundere (Kargapazari Mountains) and its surroundings, during 1995 and 1996. 1002 plant specimen were collected in these studies. After the identification of these materials, 683 taxa, at species, subspecies and variety levels, have been established. The largest family is *Asteraceae* (96 species) and the second family is *Lamiaceae* (51 species). The largest genus is *Astragalus* (14 species) and the second genus is *Centaurea* (12 species). The research area is in the Irano-Turanian phytogeographical region. The phytogeographical spectrum of the species is as follows: Irano-Turanian elements 158 (25.1%); Euro-Siberian elements 116 (17.8%) and Mediterranean elements 20 (3.1%). The rate of endemism is 11.5%.

Key Words: Flora, Turkey, Kargapazari Mountains.

Introduction

This paper is concerned with the flora of Uzundere (Kargapazari Mountains) and its surroundings which takes place in the North-East Anatolia: in the boundaries of Erzurum Province and within A8 and A9 grid squares. The area is surrounded by Oltu stream (at south, east and north) and Tortum stream (at west) and have a surface area of about 1230 square kilometres with an altitude of 700 to 3047 metres from sea level (Fig.1).

* Author to whom correspondence should be addressed

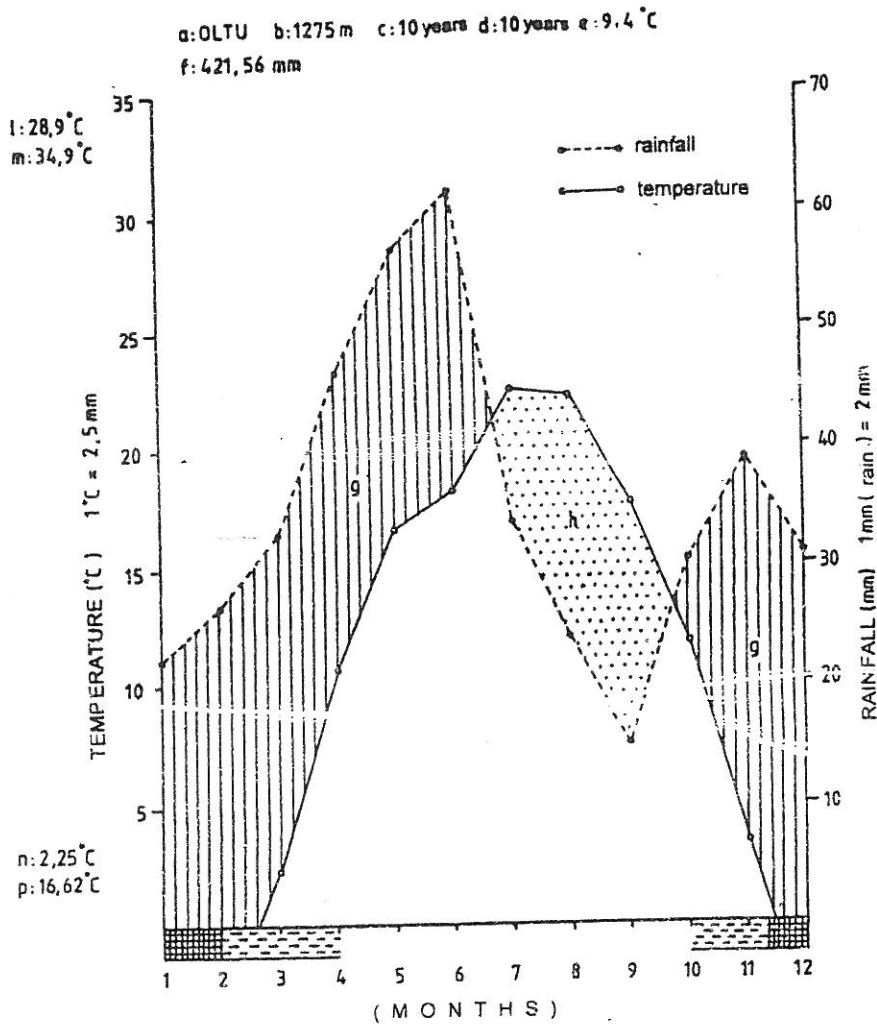


Figure 2. Climatic Diagram of Oltu.

a. Meteorology station, b. Altitude of the meteorology station, c. Duration of temperature measurement, d. Duration of rainfall measurement, e. Annual average temperature, f. Annual average rainfall, g. Rainy period, h. Dry period, i. Months with high freezing probability, l. Average high temperature of the hottest month, m. Average highest temperature of the hottest month, n. Average low temperature of the coldest month, p. Average lowest temperature of the coldest month.

Material and Method

The research material were obtained as a result of twelve field trips to the study area at different times in 1995 and 1996. During the identification of the plant samples, Flora of Turkey The East Aegean Islands ⁵ was the main reference.

In the floristic list, all the families, genera and species are given in evolutionary order as cited in The Flora ⁵. To avoid repetition, the localities are given in a list. Every species, in the floristic list, is represented in the following order: The name and the author of the species, the locality list number, the citation of the specimens collected from the study area, the endemism, phytogeographical elements and Red Data Categories ⁶.

During the citation of species, the red data categories, phytogeographical regions ect. are used as abbreviations. These abbreviations are: Ex-Extinct; E-Endangered; V-Vulnerable; R-Rare; nt-No risk; K-Insufficiently known; I-Indeterminate; Ir.-Tur.-Irano-Turanian; Eux.-Euxine; Medit.-Mediterranean; E.Medit.-East Mediterranean; Abd.-Abdullah.

The collected samples are kept in VANF (Herbarium of Yüzüncü Yıl University).

The life forms which are analyzed according to Raunkiaer ⁷ and phytogeographical distribution of each taxa are given in "Result and Discussions" section. The obtained results were also discussed by comparing with the results of other nearest floristic researches ⁸⁻¹³.

Localities from which plant samples were collected, and the specimen numbers

(Abd. 1001 - 2002)

1. A9, Oltu, around Oltu, around arable fields, 1300-1400 m, 5.18.1995

1001 - 1034

2. A8, Uzundere, Azort high plateau, nursery field, 2000-2300 m,
5.19.1995
1035 - 1065
3. A8, Uzundere, between Yayla and Başbağlar villages, 1800-2000 m,
5.19.1995
1066 - 1087
4. A8, Oltu, between Çamlıbel and İnancı villages, 1600-1900 m,
5.19.1995
1088 - 1093
5. A8, Uzundere, Azort high plateau, forest area, 2000-2300 m,
5.19.1995
1094 - 1099
6. A8, Oltu, between İnancı and Başbağlar villages, 1800-1900 m,
5.19.1995
1100 - 1101
7. A8, Oltu, İnci Village, Mağarabaşı place, woodland, 2000-2300 m,
5.20.1995
1102 - 1109
8. A8, Oltu, around İnci Village, 1600-1800 m, 5.20.1995
1110 - 1123
9. A9, Oltu, Kesik Köprü place, 1400-1600 m, 5.21.1995
1124 - 1150
10. A9, Olur, around Ormanağzı Village, 1100-1800 m, 5.21.1995
1151 - 1161
11. A9, Oltu, around Tuzla Village, 1200-1400 m, 5.22.1995
1162 - 1170
12. A9, Olur, around Ormanağzı Village, 1100-1800 m, 5.22.1995
1171 - 1178
13. A8, Uzundere, Dikyar Village, Avuşgen place, 1200-1500 m,
5.23.1995
1179 - 1183
14. A8, Uzundere, from Uzundere to Çağlayan Village, 1000-1200 m,
5.24.1995
1184 - 1202

15. A8, Uzundere, from Aksukapı to Yayla Village, 1600-2000 m,
5.25.1995
1203 - 1208
16. A8, Uzundere, Azort high plateau, 2000-2300 m, 6.18.1995
1209 - 1296
17. A8, Uzundere, Yayla Village, around arable fields, 1800-2000 m,
6.18.1995
1297 - 1341
18. A8, Oltu, around Orcuk Village, 1600-1800 m, 6.19.1995
1342 - 1369
19. A8, Oltu, around İnancı Village, step, 1700-1900 m, 6.20.1995
1370 - 1381
20. A8, Oltu, around the road İnci Village, 1600-1800 m, 6.20.1995
1382 - 1403
21. A9, Oltu, from Tuzla Village to Olur, 1200-1400 m, 6.21.1995
1404 - 1426
22. A9, Oltu, around Dutlu Village, 1300-1500 m, 6.21.1995
1427 - 1433
23. A9, Oltu, from Günlüce Village to Ormanağzı Village, along the forest
road, 1500-2000 m, 6.22.1995
1434 - 1452
24. A9, Oltu, around the Şendurak Village, around arable fields, 1300-
1500 m, 6.23.1995
1453 - 1472
25. A9, Oltu, around the Uzunoluk forest park, forest area, 1700-1800 m,
6.23.1995
1473 - 1490
26. A8, Uzundere, Uzundere forest, Aros place, 1600-1800 m, 6.24.1995
1491 - 1501
27. A8, Uzundere, around Kirazlı Village, step, 1200-1600 m, 6.24.1995
1502 - 1512
28. A8, Uzundere, Yayla Village, around arable fields, 1800-2000 m,
7.09.1995
1513 - 1547

29. A9, Oltu, from Günlüce Village to Ormanağzı Village, 1500-2000 m,
7.10.1995
1548 - 1585
30. A8, Oltu, around the Orcuk Village, 1600-1800 m, 7.11.1995
1586 - 1608
31. A8, Uzundere, Yayla Village, around arable fields, 1900-2100 m,
7.12.1995
1609 - 1641
32. A8, Uzundere, from Uzundere to Çağlayan Village, 1000-1200 m,
7.12.1995
1642 - 1651
33. A9, Oltu, from Dutlu Village to Dutlu Mount, 1500-2200 m,
7.13.1995
1652 - 1737
34. A8, Uzundere, Uzundere Forest, forest area, 1900-2300 m,
7.13.1995
1738 - 1765
35. A8, Uzundere, from Cevizli Village, 1200-1400 m, 7.14.1995
1766 - 1785
36. A8, Uzundere, between Cevizli and Çağlayan villages, 1000-1400 m,
7.14.1995
1786 - 1799
37. A8, Uzundere, from Aksukapı to Yayla Village, 1600-2000 m,
8.10.1995
1800 - 1817
38. A9, Oltu, from Günlüce Village to Ormanağzı Village, 1500-2000 m,
8.11.1995
1818 - 1838
39. A9, Oltu, from Gökçedere Village to Güryaprak Village, 1400-2200
m, 8.12.1995
1839 - 1863
40. A8, Oltu, around the road of İnci Village, Hanlar place, 1600-1800 m,
8.12.1995
1864 - 1879

41. A8, Olur, from Ayvalı Village to İřhan Village, along the highway, 800-1100 m, 8.13.1995

1880 - 1915

42. A8, Uzundere, Uzundere Forest, 1800-2200 m, 8.16.1995

1916 - 1932

43. A9, Oltu, from Dutlu Village to Dutlu Mount, 1500-2200 m, 9.11.1995

1933 - 1940

44. A8, Uzundere, Azort high plateau, nursery field, 1900-2200 m, 9.12.1995

1941 - 1944

45. A8, Oltu, from İnanmıř Village to Orcuk Village, 1600-1900 m, 9.12.1995

1945 - 1948

46. A9, Oltu, from Tuzla Village to Günlüce Village, 1200-1600 m, 11.5.1995

1949 - 1954

47. A8, Oltu, from Orcuk Village to İnanmıř Village, 1600-1900 m, 11.6.1995

1955 - 1956

48. A8, Uzundere, around Yayla Village, 1900-2100 m, 5.05.1996

1957 - 1963

49. A9, Oltu, around Günlüce Village, 1500-1800 m, 5.06.1996

1964 - 1973

50. A9, Oltu, Günlüce Village, Kırdağ, 1900-2200 m, 5.06.1996

1974 - 1979

51. A9, Oltu, Dutlu Mount, Koçaklar place, 1900-2100 m, 5.06.1996

1980 - 1983

52. A9, Oltu, from Dutlu Mount to Dutlu Village, 1500-2200 m, 5.06.1996

1984 - 1988

53. A9, Oltu, from Oltu to Olur, along the highway, 1100-1400 m, 5.07.1996

1989 - 1992

54. A8, Olur, from Ayvalı Village to İřhan Village, 800-1100 m,
5.08.1996

1993 - 1997

55. A8, Uzundere, from Balıklı Village to Altınçanak Village, 11900-1200
m, 5.08.1995

1998 - 2002

The Floristic List

I. DIVISIO: PTERIDOPHYTA

1. EQUISETACEAE

1. *Equisetum hyemale* L., 42, Abd. 1929
2. *E. ramosissimum* Desf., 36, Abd. 1790

II. DIVISIO: SPERMATOPHYTA

GYMNOSPERMAE

2. PINACEAE

1. *Pinus sylvestris* L., 16, Abd. 1250, Euro-Sib.

3. CUPRESSACEAE

1. *Juniperus communis* L. subsp. *nana* Syme, 16, Abd. 1251
2. *J. oxycedrus* L. subsp. *oxycedrus*, 17, Abd. 1340
3. *J. foetidissima* Willd., 16, Abd. 1251.

4. EPHEDRACEAE

1. *Ephedra major* Host, 46, Abd. 1952.

ANGIOSPERMAE

DICOTYLEDONES

5. RANUNCULACEAE

1. *Nigella arvensis* L., 24, Abd. 1459.
2. *Caltha polypetala* Hochst. ex Lorent, 5, Abd. 1098.
3. *Delphinium albiflorum* DC., 20, Abd. 1400.
4. *Consolida hohenackeri* (Boiss.) Grossh., 38, Abd. 1827, Ir.-Tur.

5. *C. orientalis* (Gay) Schröd., 14, Abd. 1196
6. *Anemone albana* Stev., 16, Abd. 1239, Ir.-Tur.
7. *Clematis orientalis* L., 33, Abd. 1701.
8. *Adonis aestivalis* L. subsp. *parviflora* (Fisch ex DC.) Busch, 1, Abd. 1024.
9. *Ranunculus brachylobus* Boiss.&Hoh. subsp. *brachylobus*, 2, Abd. 1081.
10. *R. dissectus* Bieb. subsp. *napelliflorus* (DC.) Davis, 7, Abd. 1102.
11. *R. repens* L., 4, Abd. 1091.
12. *R. kotschii* Boiss., 1, Abd. 1026.
13. *R. constantinopolitanus* (DC.) d.'Urv., 4, Abd. 1090.
14. *R. arvensis* L., 8, Abd. 1110.
15. *Ceratocephalus falcatus* (L.) Pers., 50, Abd. 1974.
16. *Thalictrum isopyroides* C.A. Meyer, 30, Abd. 1608.
17. *T. minus* L. var. *minus*, 23, Abd. 1434.

6. BERBERIDACEAE

1. *Berberis vulgaris* L., 9, Abd. 1148.

7. PAPAVERACEAE

1. *Chelidonium majus* L., 23, Abd. 1441, Euro-Sib.
2. *Glaucium grandiflorum* Boiss.&Huet var. *grandiflorum*, 49, Abd. 1965, Ir.-Tur.
3. *G. grandiflorum* Boiss.&Huet var. *torquatum* Gullen, 22, Abd. 1433, Ir.-Tur., "V".
4. *G. cappadocicum* Boiss., 12, Abd. 1171, End., Ir.-Tur., "R"
5. *Papaver orientale* L. var. *parviflorum* Busch., 23, Abd. 1435, Ir.-Tur., "R"
6. *P. paucifolium* (Trautv.) Fedde, 17, Abd. 1330, Ir.-Tur.
7. *P. tauricola* Boiss., 31, Abd. 1627.
8. *P. fugax* Poiret var. *fugax*, 26, Abd. 1495, End., Ir.-Tur.
9. *P. macrostomum* Boiss. et Huet ex Boiss., 9, Abd. 1137, Ir.-Tur.
10. *Fumana microcarpa* Boiss., 2, Abd. 1055.

8. BRASSICACEAE (CRUCIFERAE)

1. *Rhaphanus raphanistrum* L., 10, Abd. 1160.
2. *Crambe orientalis* L. var. *orientalis*, 14, Abd. 1192, Ir.-Tur.
3. *Conringia orientalis* (L.) Andrz., 30, Abd. 1604.
4. *C. planisiliqua* Fisch & Mey., 8, Abd. 1015.
5. *C. persica* Boiss., 9, Abd. 1124.
6. *C. perfoliata* (C. A. Meyer) Busch, 52, Abd. 1986.
7. *Lepidium sativum* L. subsp. *sativum*, 35, Abd. 1782.
8. *Cardaria draba* (L.) Desv. subsp. *draba*, 1, Abd. 1022.
9. *C. draba* (L.) Desv. subsp. *chalepensis* (L.) O.E. Schultz, 28, Abd. 1540.
10. *Isatis cappadocica* Desv. subsp. *cappadocica*, 9, Abd. 1141, Ir.-Tur.
11. *I. aucheri* Boiss., 3, Abd. 1082, End., Ir.-Tur.
12. *I. glauca* Aucher ex Boiss. subsp. *glauca*, 3, Abd. 1085, Ir.-Tur.
13. *Coluteocarpus vesicaria* (L.) Holmoe subsp. *vesicaria*, 48, Abd. 1960, Ir.-Tur.
14. *Aethionema arabicum* (L.) Andrz. ex DC., 8, Abd. 1112.
15. *A. cordatum* (Desf.) Boiss., 30, Abd. 1601, Ir.-Tur.
16. *A. speciosum* Boiss. & Huet, 2, Abd. 1036, Ir.-Tur.
17. *A. trinervium* (DC.) Boiss., 7, Abd. 1105.
18. *A. diastrophis* Bunge, 9, Abd. 1133, "K".
19. *Thlaspi perfoliatum* L., 48, Abd. 1962.
20. *T. oxyceras* (Boiss.) Hedge, 49, Abd. 1971.
21. *Capsella bursa-pastoris* (L.) Medik, 19, Abd. 1271.
22. *Alyssum linifolium* Steph. ex Willd. var. *linifolium*, 1, Abd. 1012.
23. *A. alyssoides* (L.) L., 1, Abd. 1013.
24. *A. strigosum* Banks & Sol. subsp. *strigosum*, 9, Abd. 1127.
25. *A. ochroleucum* Boiss. & Huet, 16, Abd. 1229, End.
26. *A. artvinense* Busch, 4, Abd. 1093, End., "R".
27. *A. praecox* Boiss. & Bal. var. *praecox*, 16, Abd. 1282, End.
28. *A. pateri* Nyar. subsp. *prostratum* (Nyar.) Dudley, 9, Abd. 1133, End.
29. *A. murale* Waldst. & Kit. var. *alpinum* Boiss. ex Nyar., 16, Abd.

9. *C. armeniacum* Gren., 9, Abd. 1126.
10. *C. chloriflorum* Fisch. & Mey., 10, Abd. 1159.
11. *C. fragillimum* Boiss., 10, Abd. 1152.
12. *Dianthus crinitus* Sm. var. *crinitus*, 24, Abd. 1464.
13. *D. erythrocoleus* Boiss., 33, Abd. 1709, 37, Abd. 1815, End., Ir.-Tur.
14. *D. calocephalus* Boiss., 33, Abd. 1671.
15. *Saponaria prostrata* Willd. subsp. *calvertii* (Boiss.) Hedge, 3, Abd. 1071.
16. *Gypsophila elegans* Bieb., 17, Abd. 1303, Ir.-Tur.
17. *G. bitlisensis* Bark., 33, Abd. 1723, End., Ir.-Tur., "R".
18. *Vaccaria pyramidata* Medik. var. *grandiflora* (Fisch ex DC.) Gullen, 14, Abd. 1193.
19. *Silene saxatilis* Sims, 33, Abd. 1712.
20. *S. marschalli* C. A. Mayer, 23, Abd. 1407, Ir.-Tur.
21. *S. laxa* Boiss. & Kotschy, 34, Abd. 1752, Ir.-Tur.
22. *S. spergulifolia* (Desf.) Bieb., 16, Abd. 1245, Ir.-Tur.
23. *S. montbretiana* Boiss., 3, Abd. 1085, Ir.-Tur.
24. *S. dianthoides* Pers., 16, Abd. 1234, Ir.-Tur.
25. *S. vulgaris* (Moench) Garcke var. *vulgaris*, 1, Abd. 1017.
26. *S. alba* (Miller) Krause subsp. *divaricata* (Reich.) Walthus, 16, Abd. 1272.
27. *S. dichotoma* Ehrh. subsp. *dichotoma*, 42, Abd. 1928.

15. ILLECEBRACEAE

1. *Paronychia kurdica* Boiss. subsp. *kurdica* var. *kurdica*, 21, Abd. 1404, Ir.-Tur.

16. POLYGONACEAE

1. *Atraphaxis billardieri* Jaub & Spach var. *billardieri*, 14, Abd. 1190, Ir.-Tur.
2. *A. billardieri* Jaub & Spach. var. *tournefortii* (Jaub. & Spach) Gullen, 24, Abd. 1470, Ir.-Tur.
3. *Polygonum persicaria* L., 37, Abd. 1808.
4. *P. avicularia* L., 43, 1938.

5. *P. dumetorum* L., 34, Abd. 1647.
6. *Rumex scutatus* L., 23, Abd. 1451.
7. *R. tuberosus* L. subsp. *creticus* (Boiss.) Rech., 10, Abd. 1154.
8. *R. tuberosus* L. subsp. *horizontalis* (Koch) Rech., 23, Abd. 1440.

17. CHENOPODIACEAE

1. *Chenopodium foliosum* (Moench) Aschers, 29, Abd. 1584.
2. *C. album* L. subsp. *album* var. *album*, 41, Abd. 1883.
3. *Krascheninnikovia ceratoides* (L.) Guldenst., 37, Abd. 1810.

18. AMARANTHACEAE

1. *Amaranthus retroflexus* L., 41, Abd. 1886.

19. TAMARICACEAE

1. *Tamarix symyrensis* Bunge, 14, Abd. 1199.
2. *Myricaria germaniaca* (L.) Desv., 37, Abd. 1811.

20. HYPERICACEAE (GUTTIFERAE)

1. *Hypericum scabrum* L., 17, Abd. 1309.
2. *H. venustum* Fenzl., 15, Abd. 1204.
3. *H. linarioides* Bosse, 17, Abd. 1300.
4. *H. armenum* Jaub. & Spach, 17, Abd. 1310.
5. *H. perforatum* L., 29, Abd. 1551.
6. *H. lydiu* Boiss., 14, Abd. 1197.

21. MALVACEAE

1. *Malva neglecta* Wallr., 17, Abd. 1336.
2. *Alcea striata* (DC.) Alef. subsp. *striata*, 21, Abd. 1424.
3. *A. calvertii* (Boiss.) Boiss., 33, Abd. 1669, End., Ir.-Tur.
4. *A. lavateriflora* (DC.) Boiss., 39, Abd. 1854, "R".
5. *Althea cannabina* L., 41, Abd. 1889.

22. TILIACEAE

1. *Tili rubra* DC: subsp. *caucasica* (Rpr.) V. Engler, 53, Abd. 19489, Eux.

23. LINACEAE

1. *Linum mucronatum* Bertol subsp. *armenum* (Bordz.) Davis, 11, Abd. 1162.

2. *L. nervosum* Waldst. & Kit., 17, Abd. 1306.
3. *L. tenuifolium* L., 29, Abd. 1559.
4. *L. austriacum* L. subsp. *austriacum*, 7, Abd. 1205.
5. *L. catharticum* L., 42, Abd. 1916, Euro-Sib.

24. GERONIACEAE

1. *Geranium tuberosum* L. subsp. *tuberosum*, 9, Abd. 1131.
2. *G. macrostylum* Boiss., 1, Abd. 1021.
3. *G. collinum* Steph. ex Willd., 45, Abd. 1946.
4. *G. polypetalum* Fisch. & Mey., 25, Abd. 1447.
5. *G. ibericum* Cav. subsp. *ibericum*, 25, Abd. 1478.
6. *Erodium moschatum* (L.) L'Herit, 49, Abd. 1964, Medit.
7. *Pelargonium endlicherianum* Fenzl, 27, Abd. 1507.

25. ZYGOPHYLLACEAE

1. *Peganum harmala* L., 21, Abd. 1426.

26. RUTACEAE

1. *Haplophyllum armenum* Spach, 33, Abd. 1720, End.

27. ACERACEAE

1. *Acer divergens* Pax var. *divergens*, 21, 36, Abd. 1423, Abd. 1796, End.
2. *A. divergens* Pax var. *trilobum* Yalt., 23, Abd. 1445, End., Ir.-Tur.

28. VITACEAE

1. *Vitis sylvestris* Gmelin, 41, Abd. 1880.

29. RHAMNACEAE

1. *Paliurus spina-christi* Miller, 14, Abd. 1189.
2. *Rhamnus pallasii* Fisch. & Mey., 33, Abd. 1665.

30. ANACARDIACEAE

1. *Cotinus coggyria* Scop., 14, Abd. 1201.

31. CELASTRACEAE

1. *Euonymus latifolius* (L.) Miller subsp. *latifolius*, 43, Abd. 1934, Euro-Sib.
2. *E. europaeus* L., 41, Abd. 1913, Euro-Sib.

32. FABACEAE (LEGUMINOSAE)

1. *Acasia longifolia* Willd., 25, Abd. 1473.
2. *Colutea armena* Boiss. & Huet., 14, Abd. 1198.
3. *Chesneya elegans* Fomin, 6, Abd. 1100, End., Ir.-Tur., "R".
4. *Astragalus coadunatus* Hub-Mor. & Chamb., 29, Abd. 1570, End., Ir.-Tur., "R".
5. *A. galegiformis* L., 18, Abd. 1359, Euro-Sib.
6. *A. aureus* Willd., 33, Abd. 1667, Ir.-Tur.
7. *A. eriocephalus* Willd. subsp. *eriocephalus*, 32, Abd. 1651, "R".
8. *A. lagurus* Willd. 33, Abd. 1666, Ir.-Tur.
9. *A. cancellatus* Bunge, 34, Abd. 1743, Ir.-Tur.
10. *A. atrocarpus* Chamb. & Matthews, 1, Abd. 1006, End., Ir.-Tur., "R".
11. *A. fumosus* Boiss., 3, Abd. 1068, End.
12. *A. onobrychioides* Bieb., 28, Abd. 1518.
13. *A. bicolor* Lam., 16, Abd. 1215, End., Ir.-Tur.
14. *A. cylindraceus* DC., 18, Abd. 1263, End., Ir.-Tur.
15. *A. czorochensis* Charadze, 26, Abd. 1500, Eux. mt., "R".
16. *A. campylosema* Boiss. subsp. *campylosema*, 17, Abd. 1308, End., Ir.-Tur.
17. *A. kastamonuensis* Chamb. & Matthews, 24, Abd. 1467, End., Ir.-Tur.
18. *Oxytropis albana* Stev., 43, Abd. 1935.
19. *O. lazica* Boiss., 5, Abd. 1094.
20. *Cicer anatolicum* Alef., 26, Abd. 1498, Euro-Sib.
21. *Vicia cracca* L. subsp. *cracca*, 17, Abd. 1302, Euro-Sib.
22. *V. cracca* L. subsp. *tenuifolia* (Roth.) Gaudin, 33, Abd. 1736.
23. *V. cracca* L. subsp. *stenophylla* Vel., 31, Abd. 1623.
24. *V. villosa* Roth. subsp. *villosa*, 42, Abd. 1930.
25. *V. trunculata* Fischer ex Bieb., 17, Abd. 1305, Euro-Sib.
26. *V. erzurumica* Demirkuş ex Erik (yayına hazırlanmakta), 26, Abd. 1492, End., "E".

27. *Lathyrus pratensis* L., 39, Abd. 1849.
28. *L. tuberosus* L., 24, Abd. 1461, Euro-Sib.
29. *L. rotundifolius* Willd. subsp. *miniatus* (Bieb. ex Stev.) Davis, 10, Abd. 1153.
30. *Pisum sativum* subsp. *elatus* (Bieb.) Asches&Graebn var. *elatus*, 17, Abd. 1319, Medit.
31. *Trifolium ambiguum* Bieb., 16, Abd. 1258.
32. *T. pratense* L. var. *pratense*, 1, Abd. 1007.
33. *T. trichoccephalum* Bieb., 17, Abd. 1321.
34. *Melilotus officinalis* (L.) Desr., 20, Abd. 1394.
35. *Trigonella arcuata* C. A. Meyer, 3, Abd. 1070.
36. *Medicago lupulina* L., 3, Abd. 1074.
37. *Lotus corniculatus* L. var. *corniculatus*, 30, Abd. 1599.
38. *L. corniculatus* L. var. *tenuifolius* L., 31, Abd. 1639.
39. *L. corniculatus* L. var. *alpinus* Ser., 3, Abd. 1073.
40. *Anthyllis vulneraria* L. subsp. *polyphylla* (DC.) Nyman, 29, Abd. 1561, Euro-Sib.
41. *A. vulneraria* L. subsp. *boissieri* (Sag.) Bornm., 16, Abd. 1291.
42. *Coronilla orientalis* Miller var. *orientalis*, 18, Abd. 1351.
43. *C. varia* L. subsp. *varia*, 39, Abd. 1850.
44. *Hedysarum varium* Willd., 27, Abd. 1504, Ir.-Tur.
45. *H. nitidum* Willd., 18, Abd. 1356, End., Ir.-Tur.
46. *H. huetii* Boiss., 27, Abd. 1512, Ir.-Tur., "K".
47. *H. cappadocicum* Boiss., 14, Abd. 1188, End., Ir.-Tur.
48. *H. elegans* Boiss. & Huet., 19, Abd. 1372, Ir.-Tur.
49. *H. Onobrychis cornuta* (L.) Desv., 27, Abd. 1510, Ir.-Tur.
50. *H. stenostachya* Freyn subsp. *sosnowskyi* (Grossh.) Hedge, 20, Abd. 1392, End., Ir.-Tur., "R".
51. *H. oxyodonta* Boiss. var. *oxyodonta*, 31, Abd. 1624.
52. *H. huetiana* Boiss., 20, Abd. 1389, End., Ir.-Tur., "R".
53. *H. tournefortii* (Willd.) Desv., 18, Abd. 1361, End.
54. *H. oltense* B. Yıldız et Aktoklu, 27, Abd. 1504.

33. ROSACEAE

1. *Prunus domestica* L. 41, Abd. 1905.
2. *P. divaricata* Ledeb. subsp. *divaricata*, 38, Abd. 1838.
3. *Cerasus angustifolia* (Spach) Browicz. var. *angustifolia*, 20, Abd. 1403, Ir.-Tur.
4. *C. avium* (L.) Moench, 35, Abd. 1775.
5. *C. vulgaris* Miller, 35, Abd. 1776.
6. *C. mahaleb* (L.) Miller var. *mahaleb*, 38, Abd. 1821.
7. *Persica vulgaris* Miller, 35, Abd. 1774.
8. *Flipendula vulgaris* Moench. 23, Abd. 1436, Euro-Sib.
9. *Rubus saxatilis* L. 39, Abd. 1842.
10. *R. caesius* L. 35, Abd. 1783.
11. *R. discolor* Weihe & Nees, 41, Abd. 1911.
12. *Potentilla anatolica* Peşmen, 25, Abd. 1489, End., Ir.-Tur.
13. *P. crantzii* (Crantz.) G. Beck ex Fritsch var. *crantzii*, 16, Abd. 1216, Euro-Sib.
14. *P. geranoides* Willd. 2, Abd. 1059, Ir.-Tur.
15. *Fragaria vesca* L. 25, Abd. 1480.
16. *Geum urbanum* L. 42, Abd. 1919.
17. *Agrimonia eupatoria* L. 30, Abd. 1591.
18. *Sanguisorba minor* Scop. subsp. *minor*, 33, Abd. 1655.
19. *Alchemilla caucasica* Buser, 16, Abd. 1236, Eux. mt.
20. *A. stricta* Rothm. 31, Abd. 1631.
21. *Rosa pimpinellifolia* L. 23, Abd. 1444, Euro-Sib.
22. *R. elymaitica* Boiss & Hauskn. 33, Abd. 1656, Ir.-Tur., "R".
23. *R. gallica* L. 24, Abd. 1368.
24. *R. iberica* Stev. 39, Abd. 1844.
25. *Cotoneaster nummularia* Fisch. & Mey. 33, 39, Abd. 1673, Abd. 1869.
26. *Crataegus orientalis* Pallas ex Bieb. var. *orientalis*, 38, Abd. 1820.
27. *C. pseudoheterophylla* Pojark, 9, Abd. 1147, Ir.-Tur.
28. *Sorbus umbellata* (Desf.) Fritsch var. *umbellata*, 33, Abd. 1707.

29. *Cydonia oblonga* Miller, 36, Abd. 1799.

30. *Pyrus communis* L. subsp. *sativa* (DC.) Hedge, 38, Abd. 1818.

31. *P. communis* L. subsp. *caucasica* (Fed.) Browicz, 38, Abd. 1819.

32. *P. salicifolia* Pallas var. *salicifolia*, 13, Abd. 1183, "R".

34. PUNICACEAE

1. *Punica granatum* L. 41, Abd. 1898.

35. LYTHRACEAE

1. *Lythrum salicaria* L. 36, Abd. 1876, Euro-Sib.

36. ONAGRACEAE

1. *Epilobium anagrostifolium* L. 39, Abd. 1841.

2. *E. hirsutum* L. 41, Abd. 1885.

3. *E. confusum* Hausskn. 36, Abd. 1789, Ir.-Tur.

37. CUCURBITACEAE

1. *Bryonia alba* L. 41, Abd. 1892, Euro-Sib.

38. CRASSULACEAE

1. *Sedum telephium* L. subsp. *maximum* (L.) Krocke, 40, Abd. 1878, Euro-Sib.

2. *S. spurium* Bieb. 30, Abd. 1603.

3. *S. album* L. 24, Abd. 1463.

4. *S. subulatum* (C. A. Meyer) Boiss. 33, Abd. 1713.

5. *S. magellense* Ten. 33, Abd. 1715.

6. *S. gracile* C. A. Meyer, 16, Abd. 1280, Eux. mt.

7. *S. sempervivoides* Bieb. 24, Abd. 1472.

8. *S. pilosum* Bieb. 16, Abd. 1261.

9. *S. pallidum* Bieb. var. *bithynicum* (Boiss.) Chamberlain, 33, Abd. 1714, Eux.

10. *Sempervivum transcaucasicum* Muirhead, 41, Abd. 1897, "R".

39. SAXIFRAGACEAE

1. *Saxifraga paniculata* Miller subsp. *paniculata*, 16, Abd. 1262.

2. *S. adscendens* L. subsp. *adscendens*, 33, Abd. 1716.

40. APIACEAE (UMBELLIFERAE)

1. *Eryngium billardieri* Delar., 37, Abd. 1817, Ir.-Tur.

2. *Chaerophyllum macrospermum* (Sprengel) Fisch. & Mey., 39, Abd. 1858, Ir.-Tur.
 3. *Anthriscus nemorasa* (Bieb.) Sprengel, 25, Abd. 1483.
 4. *Bunium microcarpum* (Boiss.) Freyn. subsp. *bourgeri* (Boiss.) Hedge & Lamond, 31, Abd. 1611.
 5. *Carum meifolium* (Bieb.) Boiss., 19, Abd. 1370.
 6. *Physospermum cornubiense* (L.) DC., 39, Abd. 1848.
 7. *Eleutherospermum cicutarium* (Bieb.) Boiss., 39, Abd. 1894.
 8. *Prangos pabularia* Lindl., 9, Abd. 1145, Ir.-Tur.
 9. *P. ferulacea* (L.) Lindl., 27, Abd. 1511.
 10. *Bupleurum schistosum* Woronw., 21, Abd. 1416, End., Ir.-Tur.
 11. *B. falcatum* L. subsp. *cernuum* (Ten.) Arc., 38, Abd. 1828.
 12. *Cicuta virosa* L., 33, Abd. 1700, "K".
 13. *Cnidium silaifolium* (Jacq.) Simonkai, 20, Abd. 1397.
 14. *Malabalia secacul* Banks & Sol., 30, Abd. 1597.
 15. *Heracleum platytaenium* Boiss., 23, Abd. 1452, End., Eux.
 16. *H. pastinacifolium* C. Koch subsp. *incanum* (Boiss. & Huet) Davis., 33, Abd. 1701. End.
 17. *Laser tribolum* (L.) Barkh., 25, Abd. 1542, Ir.-Tur.
 18. *Astrodaucus orientalis* (L.) Drude, 28, Abd. 1542, Ir.-Tur.
 19. *Caucalis platycarpus* L., 40, Abd. 1867.
- 41. CORNACEAE**
1. *Cornus sanguinea* L. subsp. *australis* (J.A. Meer) Jav., 36, Abd. 1797, Euro-Sib.
 2. *C. mas* L., 35, Abd. 1773, Euro-Sib.
- 42. CAPRIFOLIACEAE**
1. *Lonicera caucasica* Pallas subsp. *caucasica*, 23, Abd. 1446.
 2. *L. caprifolium* L., 39, Abd. 1859.
- 43. VALERIANACEAE**
1. *Valeriana alliarifolia* Adams., 25, Abd. 1482.
 2. *Centranthus longiflorus* Stev., 9, Abd. 1144, Ir.-Tur.

44. MORINACEAE

1. *Morina persica* L., 20, Abd. 1402, Ir.-Tur.

45. DISPACACEAE

1. *Knautia montana* (Bieb.) DC., 28, Abd. 1545, Euro-Sib., "R".
2. *K. involucrata* Somm & Lev., 40, Abd. 1871, Eux. mt.
3. *Scabiosa crinita* Katschy & Boiss., 21, Abd. 1410, Ir.-Tur.
4. *S. argentea* L., 17, Abd. 1323.

46. ASTERACEAE (COMPOSITAE)

1. *Telekia speciosa* (Shreber) Baumg., 35, Abd. 1780, Euro-Sib.
2. *Inula helenium* L. subsp. *orygalis* (Boiss.) Grierson, 39, Abd. 1862, End., Eux.
3. *I. salicina* L., 21, Abd. 1413, Euro-Sib., "R".
4. *I. mariae* Bordz., 30, Abd. 1602, Eux. mt.
5. *I. oculus-christi* L., 36, Abd. 1689, Euro-Sib.
6. *I. montbretiana* DC., 33, Abd. 1717, Ir.-Tur.
7. *Pulicaria dysenterica* (L.) Bernth., 41, Abd. 1884.
8. *Antennaria dioica* (L.) Gaertner, 16, Abd. 1284, Euro-Sib.
9. *Helicrhysum plicatum* DC. subsp. *plicatum*, 29, Abd. 1563.
10. *H. arenarium* (L.) Moench subsp. *aucheri* (Boiss.) Davis & Kupicha, 18, Abd. 1350.
11. *H. arenarium* (L.) Moench subsp. *erzincanicum* Davis & Kupicha, 33, Abd. 1722, End., Ir.-Tur.
12. *Solidago virgurea* L. subsp. *alpestris* (Waldst. & Kit.) Gaudin, 39, Abd. 1839, Euro-Sib.
13. *Aster amellus* L. subsp. *ibericus* (Stev.) Avetisian, 28, Abd. 1527.
14. *A. alpinus* L., 34, Abd. 1760.
15. *A. tripolium* L., 28, Abd. 1532, "V".
16. *Erigeron caucasicus* Stev. subsp. *caucasicus*, 30, Abd. 1590, Eux. mt.
17. *E. caucasicus* Stev. subsp. *venustus* (Batsch.) Grierson, 34, Abd. 1760.
18. *E. acer* L. subsp. *pycnotrichus* (Vierh.) Grierson, 16, Abd. 1255.
19. *Conyza canadensis* (L.) Cronquist, 41, Abd. 1907.

20. *Senecio integrifolius* (L.) Clairv. subsp. *karsianus* Matthews, 16,
Abd. 1273, End., Eux. mt., "R".
21. *S. vernalis* Walldst. & Kit., 10, Abd. 1161.
22. *Tussilago farfara* L., 51, Abd. 1983, Euro-Sib.
23. *Eupatorium cannabinum* L., 41, Abd. 1912, Euro-Sib.
24. *Anthemis cretica* L. subsp. *umbliciata* (Boiss. & Huet.) Grierson, 11,
Abd. 1170.
25. *A. tinctoria* L. var. *tinctoria*, 26, Abd. 1497.
26. *A. tinctoria* L. var. *pallida* DC., 16, Abd. 1219.
27. *A. triumfettii* (L.) All., 29, Abd. 1569.
28. *Achillea millefolium* L. subsp. *millefolium*, 33, Abd. 1690, Euro-Sib.
29. *A. setacea* Waldst. & Kit., 28., Abd. 1535, Euro-Sib.
30. *A. biebersteinii* Afan., 1, Abd. 1003, Ir.-Tur.
31. *Leucanthemum vulgare* Lam., 44, Abd. 1941, Euro-Sib.
32. *Tanacetum balsamita* L. subsp. *balsamitoides* (Schultz Bip.) Grierson,
34, Abd. 1754.
33. *T. sericeum* (Adams) Schultz, 28, Abd. 1529, "R".
34. *T. oltense* (Sosn.) Grierson, 29, Abd. 1577, End., "R".
35. *T. chiliophyllum* (Fisch & Mey.) Schultz var. *chiliophyllum*, 33, Abd.
1686.
36. *T. abrotanifolium* (L.) Druce, 33, Abd. 1663, Ir.-Tur.
37. *T. argenteum* (Lam.) Willd. subsp. *canum* (C. Koch) Grierson var.
canum, 33, Abd. 1653.
38. *Tripleurospermum melanolepis* (Boiss. & Bushe) Pebed., 16, Abd.
1220.
39. *Artemisia absinthum* L., 24, Abd. 1454.
40. *Arctium tomentosum* Miller var. *glabrum* (Körnigke) Arenes, 28, Abd.
1546.
41. *Onopordum acanthium* L., 33, Abd. 1704.
42. *Cirsium adjaricum* Somm. & Lev., 40, Abd. 1874, Eux. mt., "K".
43. *C. macrobotrys* (C. Koch.) Boiss., 42, Abd. 1932.
44. *C. lappaceum* (Bieb.) Fischer subsp. *tenuilobum*. (C. Koch.) Davis &

- Parris, 42, Abd. 1931, End., Ir.-Tur.
45. *C. arvense* (L.) Scop subsp. *vesticum* (Wimmer et Graph.) Petrak, 37, Abd. 1813, Eux.
 46. *C. pseudopersonata* Boiss & Ball. subsp. *pseudopersonata*, 44, Abd. 1942, End., Eux.
 47. *C. pseudopersonata* Boiss & Ball. subsp. *kuznezowianum* (Somm & Lev.) Pertak, 33, Abd. 1967, Status: "K".
 48. *C. simplex* C. A. Meyer subsp. *armenum* (DC.) Petrak, 31, Abd. 1628.
 49. *C. libanoticum* DC. subsp. (Boiss. & Heldr.) Davis & Parris, 12, Abd. 1173, End., E. Medit mt.
 50. *Carduus lanuginosus* Willd., 28, Abd. 1547, End.
 51. *C. hamulosus* Ehrh. subsp. *hamulosus*, 18, Abd. 1362, Euro-Sib.
 52. *Jurinea pontica* Hausskn. & Freyn ex Hausskn., 21, Abd. 1412, End., Ir.-Tur.
 53. *Jurinella moschus* (Habl.) Bobrov subsp. *pinnatisecta* (Boiss.) Danin & Davis, 28, Abd. 1524, Ir.-Tur.
 54. *Serratula coriacea* Fisch. & Mey ex DC., 37, Abd. 1806, Ir.-Tur. "R".
 55. *Centaurea virgata* Lam., 37, Abd. 1803, Ir.-Tur.
 56. *C. sessilis* Willd., 33, Abd. 1706, End., Ir.-Tur.
 57. *C. rhizanta* C.A. Meyer., 30, Abd. 1586, Ir.-Tur.
 58. *C. glastifolia* L., 28, Abd. 1530, Ir.-Tur.
 59. *C. carduiformis* DC. subsp. *carduiformis*, 32, Abd. 1634.
 60. *C. carduiformis* DC. subsp. *orientalis* Wagenitz, 18, Abd. 1363, Ir.-Tur.
 61. *C. pseudascabiosa* Boiss. & Buhse subsp. *pseudascabiosa*, 27, Abd. 1509.
 62. *C. simplicicaulis* Boiss. & Huet., 17, Abd. 1307, Eux.
 63. *C. hedgei* Wagenitz, 18, Abd. 1357, End., Ir.-Tur.
 64. *C. pulcherrima* Willd. var. *pulcherrima*, 39, Abd. 1861.
 65. *C. cheiranthifolia* Willd. var. *cheiranthifolia*, 16, Abd. 1237, Eux. mt.
 66. *C. tirumfettii* All, 34, Abd. 1759.

67. *C. depressa* Bieb., 28, Abd. 1538.
68. *Carthamus lanatus* L. 39, Abd. 1845.
69. *C. glaucus* Bieb. subsp. *glaucus*, 43, Abd. 1936.
70. *Xeranthemum annuum* L., 37, Abd. 1800.
71. *Echinops sphaerocephalus* L. subsp. *sphaerocephalus*, 33, Abd. 1703, Euro-Sib.
72. *Uechtrizia armena* Freyn & Sint., 38, Abd. 1835, End., Ir.-Tur., "R".
73. *Cichorium intybus* L., 28, Abd. 1514.
74. *Scorzonera cana* (C. A. Meyer) Hoffm. var. *jacquiniana* (W. Koch) Chamberlain, 29, Abd. 1565.
75. *S. cana* (C.A. Meyer) Hoffm. var. *alpina* (Boiss.) Chamberlain, 34, Abd. 1762.
76. *S. cana* (C.A. Meyer) Hoffm. var. *radicosa* (Boiss.) Chamberlain, 16, Abd. 1222.
77. *S. parviflora* Jacq., 11, Abd. 1167.
78. *S. pseudolanata* Grossh., 48, Abd. 1967, Ir.-Tur.
79. *S. latifolia* (Fisch & Mey.) DC. var. *angustifolia* Prilipko, 29, Abd. 1574, Ir.-Tur., Status: "R".
80. *S. woronowii* Krasch, 29, Abd. 1575, Euro-Sib.
81. *Tragopogon longirostris* Bisch ex Schultz var. *abbreviatus* Boiss., 39, Abd. 1853.
82. *T. reticulatus* Boiss. & Huet., 15, Abd. 1206.
83. *T. fibrosus* Freyn & Sint ex Freyn, 17, Abd. 1332, End.
84. *Leontodon hispidus* L. var. *glabratus* (W. Koch) Bisch., 29, Abd. 1572.
85. *S. crispus* Vill. subsp. *asper* (Waldst & Kit.) Rohl. var. *asper*, 28, Abd. 1521.
86. *Picris hieracioides* L., 44, Abd. 1943, Euro-Sib.
87. *P. strigosa* Bieb., 29, Abd. 1563, Ir.-Tur.
88. *Reichardia glauca* Matthews, 28, Abd. 1533, Ir.-Tur.
89. *Hieracium lasiochaetum* (Bornm. & Zahn) Sell & West, 29, Abd.

1573. End.

90. *Pilosella hoppeana* (Schultes) C.H. & F.W. Schultz subsp. *pilisquama* (NP.) Sell & West, 26, Abd. 1494.
91. *P. x ruprechtii* (Boiss.) Sell & West, 29, Abd. 1571.
92. *P. piloselloides* (Vill.) Sojak subsp. *megalomastix* (NP.) Sell & West, 17, Abd. 1325.
93. *P. echiioides* (Lumn.) C.H. & F. W. Schultz subsp. *procera* (Fries) Sell & West, 38, Abd. 1836.
94. *P. x macrotricha* (Boiss.) C.H. & F. W. Schultz, 38, Abd. 1837.
95. *P. maschukensis* (Litw. & Zahn.) Sojak, 33, Abd. 1724.
96. *P. verruculata* (Link) Sojak, 42, Abd. 1920.
97. *Prenanthes purpurea* L., 17, Abd. 1308, "R".
98. *Lactuca saligna* L., 41, Abd. 1910.
99. *Lapsana communis* L. subsp. *alpina* (Boiss. & Bal) Sell, 41, Abd. 1890, Eux.
100. *L. communis* L. subsp. *intermedia* (Bieb.) Hayek, 18, Abd. 1354.
101. *L. communis* L. subsp. *grandiflora* (Bieb.) Sell, 43, Abd. 1940, Eux. mt.
102. *Taraxacum ceratinum* (Waldst. & Kit.) Poirer, 11, Abd. 1168.
103. *T. crepidiforme* DC. subsp. *crepidiforme*, 16, Abd. 1221, Ir.-Tur.
104. *Crepis sancta* (L.) Babcock, 29, Abd. 1549.

47. CAMPANULACEAE

1. *Campanula rapunculoides* L. subsp. *rapunculoides*, 18, Abd. 1345.
2. *C. rapunculoides* L subsp. *cordifolia* (C. Koch) Damboldt, 43, Abd. 1937.
3. *C. trachelium* L., 33, Abd. 1661.
4. *C. sibirica* L., subsp. *hohenachkeri* (Fisch. & Mey.) Damboldt, 11, Abd. 1165, Eux.
5. *C. glomerata* L. subsp. *hispida* (Witasek) Hayek, 18, Abd. 1346.
6. *C. macrochlamys* Boiss. & Huet, 3, Abd. 1078.
7. *C. allifaifolia* Willd., 29, Abd. 1578, Eux.
8. *C. betulifolia* C. Koch., 33, Abd. 1652, Eux., "R".

9. *C. tridentata* Schreber, 16, Abd. 1209, Eux.
10. *C. stevenii* Bieb. subsp. *stevenii*, 34, Abd. 1764, Eux.
11. *Asyneuma rigidum* (Willd. Grossh. subsp. *rigidum*, 42, Abd. 1831, Ir.-Tur.
12. *A. amplexicaula* (Willd.) Hand-Maz. subsp. *amplexicaula* var. *amplexicaula*, 29, Abd. 1562.
13. *A. amplexicaula* (Willd.) Hand. Maz. subsp. *amplexicaula* var. *angustifolium* (Boiss.) Bornm., 31, Abd. 1616, Ir.-Tur.
14. *A. virgatum* (Labill) Bornm, subsp. *virgatum*, 27, Abd. 1505, Ir.-Tur.

48. ERICACEAE

1. *Pyrola media* Swartz, 39, Abd. 1851, Euro-Sib.

49. PRIMULACEAE

1. *Primula veris* L. subsp. *columnae* L., 25, Abd. 1481, Euro-Sib.
2. *P. veris* L. subsp. *macrocalyx* (Bunge) Lüdi, 2, Abd. 1050, Euro-Sib.
3. *P. elatior* (L.) Hill subsp. *pseudoelatior* (L.) Hill, 33, Abd. 1688, Euro-Sib.
4. *P. longipes* Freyn & Sint., 5, Abd. 1099, End., Eux., "R".
5. *P. auriculata* Lam., 3, Abd. 1066, Ir.-Tur.
6. *P. algida* Adams, 5, Abd. 1097.
7. *Androsace armenica* Duby var. *macrantha* (Boiss. & Huet.) Martelli, 16, Abd. 1225, End., Ir.-Tur.
8. *A. villosa* L., 2, Abd. 1057, Euro-Sib.
9. *Lysimachia vulgaris* L., 32, Abd. 1649.

50. EBENACEAE

1. *Diospyros lotus* L., 39, Abd. 1843.
2. *D. kaki* L., 41, Abd. 1906.

51. OLEACEAE

1. *Jusminum fruticans* L., 9, Abd. 1149, Medit.
2. *Olea europea* L. var. *sylvestris* (Miller) Lehr., 41, Abd. 1909, Medit.

52. APOCYNACEAE

1. *Trachomitum venetum* (L.) Woodson, 41, Abd. 1899, Medit.
2. *Vinca minor* L., 41, Abd. 1891.

53. ASCLEPIADACEAE

1. *Cynanchum acutum* L. subsp. *acutum*, 36, Abd. 1788.
2. *Vincetoxicum tmoicum* Boiss., 21, Abd. 1425, Ir.-Tur.

54. GENTIANACEAE

1. *Gentiana gelida* Bieb., 33, Abd. 1730, Eux.
2. *Gentianella ciliata* (L.) Morkh. subsp. *blepharophora* (E. Bordz.) Pritchard, 43, Abd. 1934, Eux. mt.

55. CONVULVULACEAE

1. *Convolvulus lineatus* L., 20, Abd. 1383, Ir.-Tur.
2. *C. arvensis* L., 31, Abd. 1637.

56. CUSCUTACEAE

1. *Cuscuta campestris* Yuncker, 41, Abd. 1914.
2. *C. europaea* L., 34, Abd. 1744.

57. BORGINACEAE

1. *Heliotropium europaeum* L., 41, Abd. 1908, Medit.
2. *Asperugo procumbens* Ledeb., 1, Abd. 1010, Euro-Sib.
3. *Myosotis stricta* Link ex Roemer et Schultes, 16, Abd. 1228, Euro-Sib.
4. *M. arvensis* (L.) Hill subsp. *arvensis*, 2, Abd. 1045, Euro-Sib.
5. *L. lazica* M. Popov, 8, Abd. 1116, Euro-Sib.
6. *M. alpestris* F.W. Schmidt subsp. *alpestris*, 48, Abd. 1961.
7. *M. litospermifolia* (Willd) Hornem., 12, Abd. 1176.
8. *M. laxa* Lehm. subsp. *caespitosa* (C.F. Schultz) Hyl ex Nordh., 1, Abd. 1002.
9. *M. sicula* Guss., 53, Abd. 1991.
10. *Arnebia pulchra* (Roemer & Schultes) Edmondsdson, 7, Abd. 1108, Eux. mt.
11. *Buglossoides arvensis* (L.) Johnston, 8, Abd. 1111.
12. *Echium rusicum* J.F. Gmelin, 15, Abd. 1203, Euro-Sib.
13. *E. italicum* L., 28, Abd. 1515, Medit.
14. *E. vulgare* L., 17, Abd. 1320, Euro-Sib.
15. *Moltkia coerulea* (Willd.) Lehm., 14, Abd. 1197, Ir.-Tur.
16. *Onosma sericeum* Willd., 11, Abd. 1163, Ir.-Tur.

17. *O. nigricaula* H. Riedl, 9, Abd. 1134, End., Eux., "R".
18. *O. tauricum* Pallas ex Willd. var. *tauricum*, 16, Abd. 1292.
19. *Symphytum armeniacum* Bucknall, 32, Abd. 1643, End., Eux., "K".
20. *Anchusa leptophylla* Roemer & Schlutes subsp. *leptophylla*, 19, Abd. 1277.
21. *A. leptophylla* Roemer & Schultes subsp. *incana* (Ledeb.) Chamb., 10, Abd. 1153, End., Ir.-Tur.
22. *Nonea anchusoides* Boiss. & Buhse, 2, Abd. 1039, Ir.-Tur.
23. *N. intermedia* Ledeb., 16, 1266, Eux., "K".
24. *N. pulla* (L.) DC. subsp. *scabrisquamata* A. Baytop, 2, Abd. 1048, Ir.-Tur.
25. *Caccinia macranthera* (Banks & Sol.) Brand var. *crassifolia* (Vent) Brand, 1, Abd. 1020, Ir.-Tur.

58. SOLANACEAE

1. *Solanum nigrum* L. subsp. *nigrum*, 40, Abd. 1868.
2. *S. dulcamara* L., 22, Abd. 1428, Euro-Sib.
3. *S. tuberosum* L., 28, Abd. 1517.
4. *Physalis alkegeni* L., 41, Abd. 1430.
5. *Datura stramonium* L., 22, Abd. 1430.
6. *Hyoscyamus niger* L., 9, Abd. 1146.

59. SCROPHULARIACEAE

1. *Verbascum flavidum* (Boiss.) Freyn & Bornm., 14, Abd. 1185, Euro-Sib.
2. *V. georgicum* Benth., 31, Abd. 1632, Ir.-Tur.
3. *V. asperuloides* Hub.-Mor., 14, Abd. 1184, End., Ir.-Tur.
4. *V. speciosum* Schrader, 31, Abd. 1633.
5. *Scrophularia ilwensis* C. Koch., 17, Abd. 1324, Ir.-Tur.
6. *Linaria genistifolia* (L.) Miller subsp. *linifolia* (Boiss) Davis, 32, Abd. 1751.
7. *L. corifolia* Chav., 19, Abd. 1738, End., Ir.-Tur.
8. *L. armaniaca* Chav., 19, Abd. 1381, Ir.-Tur.
9. *L. kurdica* Boiss. & Hohen. subsp. *kurdica*, 37, Abd. 1816, Ir.-Tur.

10. *Digitalis ferruginea* L. subsp. *schischkinii* (Ivan.) Werner, 42, Abd. 1863, Eux.
11. *Veronica gentianoides* Vahl. subsp. *gentianoides*, 8, Abd. 1211, Eux. mt.
12. *V. anagallis-aquatica* L. subsp. *oxycarpa* (Boiss.) A. Jelem, 33, Abd. 1695.
13. *V. beccabunga* L. subsp. *beccabunga*, 25, Abd. 1488.
14. *V. beccabunga* L. subsp. *abscantia* M.A.F., 16, Abd. 1269.
15. *V. oltensis* Woron., 3, Abd. 1072, End., Ir.-Tur. "R".
16. *V. orientalis* Miller subsp. *orientalis*, 3, Abd. 1086.
17. *V. multifida* L., 1, Abd. 1023, End., Ir.-Tur.
18. *V. armena* Boiss. et Huet, 2, Abd. 1035, Ir.-Tur.
19. *Melampyrum arvense* L. var. *arvense*, 31, Abd. 1622, Euro-Sib.
20. *Euphrasia pectinata* Ten., 30, Abd. 1606, Euro-Sib.
21. *Odontites glutinosa* (Bieb.) Benthams, 30, Abd. 1593.
22. *Pedicularis wilhemsiana* Fischer ex Bieb., 8, Abd. 1121, Eux. mt.
23. *P. comosa* L. var. *sibthorpii* (Boiss.) Boiss., 13, Abd. 1181.
24. *Rhinanthus angustifolius* C. C. Gmelin subsp. *grandiflorus* (Wallr.) D. A. Webb., 18, Abd. 1344.
25. *Bungea trifida* (Vahl) C. A. Meyer, 20, Abd. 1385, Ir.-Tur.

60. OROBANCHACEAE

1. *Orobanche purpurea* Jacq., 24, Abd. 1466.
2. *O. elatior* Sutton, 33, Abd. 1723.

61. GLOBULARIACEAE

1. *Globularia trichosanctha* Fisch. & Mey., 46, Abd. 1953, "R".

62. LAMIACEAE (LABIATEAE)

1. *Ajuga orientalis* L., 8, Abd. 1120.
2. *A. chamaepitys* (L.) Schreber subsp. *cuneatifolia* (Stapf.) P.H. Davis, 1, Abd. 1031.
3. *Teucrium orientale* L. var. *orientale*, 24, Abd. 1456, Ir.-Tur.
4. *T. orientale* L. var. *puberulens* T. Ekim, 45, Abd. 1947, Ir.-Tur.
5. *T. chamaedrys* L. subsp. *chamaedrys*, 29, Abd. 1554, Euro-Sib.

6. *T. polium* L., 21, Abd. 1405.
7. *Scutellaria orientalis* A. Ham. subsp. *sosnowskyi* (Takht.) Fed., 4, Abd. 1092, Ir.-Tur. "R".
8. *Eremostachys laciniata* (L.) Bunge, 12, Abd. 1178, Ir.-Tur.
9. *Phlomis tuberosa* L., 30, Abd. 1587.
10. *P. armeniaca* Willd., 20, Abd. 1399, Ir.-Tur.
11. *Lamium garganicum* L. subsp. *reniforme* (Montbret & Aucher ex Benth) R. Mill, 10, Abd. 1156.
12. *L. tomentosum* Willd. var. *tomentosum*, 16, Abd. 1267, Ir.-Tur.
13. *L. galactophyllum* Boiss. & Reuter, 2, Abd. 1054, End. Ir.-Tur.
14. *Marrubium anisodon* C. Koch., 41, Abd. 1912.
15. *M. parviflorum* Fisch. & Mey. subsp. *parviflorum*, 28, Abd. 1525, Ir.-Tur.
16. *Sideritis montana* L. subsp. *montana*, 23, Abd. 1450, Medit.
17. *Stachys setifera* C. A. Meyer subsp. *setifera*, 23, Abd. 1439, Ir.-Tur.
18. *S. lavandulifolia* Vahl. var. *lavandulifolia*, 33, Abd. 1687, Ir.-Tur.
19. *S. lavandulifolia* Vahl. var. *brachyodon* Boiss., 19, Abd. 1373, Ir.-Tur.
20. *S. atherocalyx* C. Koch., 28, Abd. 1523, Euro-Sib.
21. *S. iberica* Bieb. subsp. *iberica* var. *iberica*, 17, Abd. 1313, Ir.-Tur.
22. *S. iberica* Bieb. subsp. *stenostacyha* (Boiss.) Rech., 30, Abd. 1592, Ir.-Tur.
23. *S. annua* (L.) L. subsp. *annua* var. *annua*, 17, Abd. 1301.
24. *Nepeta cataria* L., 23, Abd. 1437, Euro-Sib.
25. *N. nuda* L. subsp. *albiflora* (Boiss.) Germs., 33, Abd. 1694.
26. *N. transcaucasica* Grossh., 9, Abd. 1139, Ir.-Tur.
27. *N. fissa* C. A. Meyer, 38, Abd. 1829, Ir.-Tur.
28. *Lallemantia peltata* (L.) Fisch. & Mey., 17, Abd. 1329.
29. *L. canescens* (L.) Fisch. & Mey., 28, Abd. 1526, Ir.-Tur.
30. *Prunella vulgaris* L., 33, Abd. 1683, 23, Abd. 1448, Euro-Sib.
31. *P. laciniata* (L.) L., 23, Abd. 1448, Euro-Sib.
32. *Origanum vulgare* L. subsp. *vulgare*, 38, Abd. 1832, Euro-Sib.

33. *Satureja hortensis* L., 42, Abd. 1917.
34. *Clinopodium vulgare* L. subsp. *vulgare*, 39, Abd. 1840.
35. *Micromeria fruticosa* (L.) Druce subsp. *serpyllifolia* (Bieb.) P.H. Davis, 40, Abd. 1865.
36. *Thymus canoviridis* Jalas, 20, Abd. 1390, End., "R".
37. *T. transcaucasicus* Ronniger, 38, Abd. 1828, "R".
38. *T. pubescens* Boiss. & Kothly ex Celak var. *pubescens*, 38, Abd. 1828B.
39. *T. migricus* Kokov & Shost., 20, Abd. 1391, Ir.-Tur.
40. *T. bornmuelleri* Velen., 33, Abd. 1681, Medit., "R".
41. *T. praecox* Opiz subsp. *grossheimi* (Ronniger) Jalas var. *grossheimi*, 31, Abd. 1640.
42. *T. longicaulis* C. Presl. subsp. *longicaulis* var. *subisophyllus* (Borbas) Jalas, 33, Abd. 1662.
43. *Mentha longifolia* (L.) Hudson subsp. *longifolia*, 36, Abd. 1787, Eux. element.
44. *M. longifolia* (L.) Hudson subsp. *typhoides* (Briq.) Harley var. *typhoides*, 32, Abd. 1644.
45. *M. spicata* L. subsp. *spicata*, 37, Abd. 1802.
46. *Salvia pinnata* L., 17, Abd. 1312, Medit.
47. *S. bracteata* Banks & Sol., 9, Abd. 1140, Ir.-Tur.
48. *S. rosifolia* Sm., 29, Abd. 1550, End., Ir.-Tur.
49. *S. huberi* Hedge, 14, Abd. 1194, End., Ir.-Tur., "R".
50. *S. sclarea* L., 18, Abd. 1364.
51. *S. aethiopis* L., 29, Abd. 1585.
52. *S. candidissima* Vahl. subsp. *occidentalis* Hedge, 28, Abd. 1543, Ir.-Tur.
53. *S. staminea* Montbret & Aucher ex Benth, 7, Abd. 1109, Ir.-Tur.
54. *S. nemorosa* L., 29, Abd. 1582.
55. *S. verticillata* L. subsp. *verticillata*, 28, Abd. 1524.

63. PLUMBAGINACEAE

1. *Plumbago europea* L., 38, Abd. 1830, Euro-Sib.
2. *Acantholimon acerosum* (Willd.) Boiss. var. *brachystachyum* Boiss., 33, Abd. 1668, End., Ir.-Tur.
3. *A. armenum* Boiss. & Huet var. *balansae* Boiss. & Huet, 21, Abd. 1418, Ir.-Tur.

64. PLANTAGINACEAE

1. *Plantago matirima* L., 16, Abd. 1296.
2. *P. media* L., 31, Abd. 1617.
3. *P. lanceolata* L., 35, Abd. 1769.

65. TYMELAEACEAE

1. *Daphne glomerata* Lam., 16, Abd. 1249, Eux.
2. *D. oleoides* Schreber subsp. *oleoides*, 21, Abd. 1414.
3. *D. oleoides* Schreber subsp. *kurdica* (Bornm.) Bornm., 46, Abd. 1951, Ir.-Tur.

66. ELEAGNACEAE

1. *Hippophae rhamnoides* L., 35, Abd. 1778.
2. *Eleagnus angustifolia* L., 14, Abd. 1200.

67. EUPHORBIACEAE

1. *Euphorbia paralias* L., 33, Abd. 1705, Medit.
2. *E. cheiradenia* Boiss. & Hohen., 24, Abd. 1453, Ir.-Tur.
3. *E. virgata* Waldst. Kit., 49, Abd. 1973.
4. *E. iberica* Boiss., 3, Abd. 1088, Ir.-Tur.

68. URTIACEAE

1. *Urtica dioica* L., 19, Abd. 1278, Euro-Sib.

69. MORACEAE

1. *Morus alba* L., 22, Abd. 1429.
2. *Ficus carica* L. subsp. *carica*, 41, Abd. 1904.

70. ULMACEAE

1. *Celtis australis* L., 41, Abd. 1902.

71. JUGLANDACEAE

1. *Juglans regia* L., 35, Abd. 1770.

72. FAGACEAE

1. *Quercus macranthera* Fisch. & Mey. ex Hoben. subsp. *sypirensis* (C. Koch) Menitsky, 42, Abd. 1926.

73. CORYLACEAE

1. *Carpinus betulus* L., 23, Abd. 1442, Euro-Sib.
2. *Ostrya carpinifolia* Scop., 25, Abd. 1484, Medit.
3. *Corylus maxima* Miller, 35, Abd. 1772, Euro-Sib.

74. SALICACEAE

1. *Salix triandra* L. subsp. *bornmuelleri* L., 35, Abd. 1777, Ir.-Tur.
2. *S. babylonica* L., 35, Abd. 1779.
3. *Populus tremula* L., 25, Abd. 1486.
4. *P. nigra* L. subsp. *nigra*, 22, Abd. 1431.

75. RUBIACEAE

1. *Asperula glomerata* (Bieb.) Griseb. subsp. *glomerata*, 17, Abd. 1326.
2. *A. glomerata* (Bieb.) Griseb. subsp. *condensata* (Ehrend.) Ehrend. var. *condensata*, 19, Abd. 1378.
3. *A. virgata* Hub.-Mor. ex Ehrend & Schnöb.-Ten., 27, Abd. 1502, End., Ir.-Tur. "R".
4. *A. pestalozzae* Boiss., 47, Abd. 1955, End., Eux.
5. *A. woronwii* Krecz., 31, Abd. 1641, End., Eux., "R".
6. *A. orientalis* Boiss. & Hohen., 9, Abd. 1128, Ir.-Tur.
7. *Galium articulatum* Lam., 35, Abd. 1784, Eux. mt., "R".
8. *G. humifusum* Bieb., 34, Abd. 1739.
9. *G. verum* L. subsp. *verum*, 24, Abd. 1460, Euro-Sib.
10. *G. margaceum* Ehrend. & Schön.-Ten., 18, Abd. 1348.
11. *Cruciata taurica* (Pallas ex Willd.) Ehrend., 3, Abd. 1075, Ir.-Tur.
12. *C. articulata* (L.) Ehrend., 9, Abd. 1141, Ir.-Tur.
13. *Rubia tinctorum* L., 41, Abd. 1888, Ir.-Tur.

MONOCOTYLEDONES

76. LILIACEIAE

1. *Allium stamineum* Boiss., 27, Abd. 1503.
2. *A. kunthianum* Vved., 39, Abd. 1857, Ir.-Tur.

3. *A. flavum* L. subsp. *tauricum* (Besser ex Reichb.) Stearn var. *tauricum*, 24, Abd. 1426B, Medit, "R".
4. *A. armenum* Boiss. & Kotschy, 24, Abd. 1462, End., Ir.-Tur., "R".
5. *A. atrovioleaceum* Boiss., 28, Abd. 1541.
6. *A. scorodoprasmum* L. subsp. *rotundum* (L.) Stearn, 20, Abd. 1396.
7. *A. sosnowskyanum* Misch., 19, Abd. 1380, End., Eux., "R".
8. *Scilla siberica* Haw. subsp. *armena* (Grossh.) Mordak, 51, Abd. 1980, Ir.-Tur.
9. *Ornithogalum oligophyllum* E.D. Clarke, 11, Abd. 1166.
10. *O. sigmoideum* Freyn & Sint., 50, Abd. 1978.
11. *Muscari caucasicum* (Griseb.) Baker, 1, Abd. 1005, Ir.-Tur.
12. *M. tenuiflorum* Tausch, 10, Abd. 1152.
13. *M. armeniacum* Leichtlin ex Baker, 2, Abd. 1042.
14. *M. neglectum* Guss., 49, Abd. 1971.
15. *Bellevalia gracilis* Feinbrun, 1, Abd. 1009, End., Ir.-Tur.
16. *Fritillaria pinardii* Boiss., 49, Abd. 1969, Ir.-Tur.
17. *Tulipa julia* C. Koch, 7, Abd. 1107, Ir.-Tur.
18. *Gagea bulbifera* (Pallas) H. Schultes & Schultes fil., 49, Abd. 1970, Euro-Sib.
19. *G. chanae* Grossh., 2, Abd. 1047, Ir.-Tur., "K".
20. *G. villosa* (Bieb.) Duby var. *villosa*, 51, Abd. 1981, Medit.
21. *Narthecium balansae* Briq., 20, Abd. 1388, Eux., "R".
22. *Colchicum szovitsii* Fisch. & Mey., 48, Abd. 1957, Ir.-Tur.

77. IRIDACEAE

1. *Iris taochia* Woronow ex Grossh., 8, Abd. 1118, End., Ir.-Tur., "R".
2. *I. iberica* Hoffm. subsp. *elegantissima* (Sosn.) Takht. & Fedorov, 1, Abd. 1034, Ir.-Tur.
3. *I. caucasica* Hoffm. subsp. *caucasica*, 49, Abd. 1966, Euro-Sib., "R".
4. *Crocus biflorus* Miller subsp. *tauri* (Maw.) Matthew, 51, Abd. 1982, Ir.-Tur.
5. *C. vallicola* Herbert, 44, Abd. 1944, Eux.
6. *Gladiolus kotschyanus* Boiss., 31, Abd. 1612, Ir.-Tur.

7. *G. atroviolaceus* Boiss., 1, Abd. 1001, Ir.-Tur.

78. ORCHIDACEAE

1. *Platanthera bifolia* (L.) L. C. M. Richard, 26, Abd. 1496, Euro-Sib.
2. *P. chlorantha* (Custer) Reichb., 12, 1274.
3. *Ophrys oestriifera* Bieb. subsp. *oestriifera*, 34, Abd. 1749.
4. *Orchis tridentata* Scop., 3, Abd. 1067.
5. *Dactylorhiza iberica* (Bieb. ex Willd.) Soo, 33, Abd. 1671.

79. TYPHACEAE

1. *Typha latifolia* L., 40, Abd. 1877.

80. POACEAE

1. *Amblylopyrum muticum* (Boiss.) Eig var. *loliaceum* (Jaub. & Spach) Eig, 21, Abd. 1420.
2. *Aegilops triuncialis* L. subsp. *triuncialis*, 33, Abd. 1704.
3. *Psathyrostachys fragilis* (Boiss.) Nevski, 9, Abd. 1143, 23, Abd. 1449.
4. *Hordeum violaceum* Boiss. & Huet, 31, Abd. 1619.
5. *Bromus squarrosus* L., 33, Abd. 1727.
6. *B. danthoniae* Trin., 33, Abd. 1702.
7. *B. sterilis* L., 18, Abd. 1367.
8. *B. tomentellus* Boiss., 16, Abd. 1257, Ir.-Tur.
9. *B. erectus* Hudson, 33, Abd. 1691.
10. *Avena sterilis* L. subsp. *sterilis*, 37, Abd. 1814.
11. *Helictotrichon argaeum* (Boiss.) Parsa, 16, Abd. 1246.
12. *Trisetum rigidum* (Bieb.) Roemer & Schultes, 30, Abd. 1605, Ir.-Tur.
13. *T. flavescens* (L.) P. Beauv., 33, Abd. 1729, Euro-Sib.
14. *Koeleria eriostachya* Pancic, 16, Abd. 1276.
15. *K. cristata* (L.) Pers., 18, Abd. 1366, 20, Abd. 1384.
16. *Calamagrotis epigejos* (L.) Roth, 33, Abd. 1674, Euro-Sib.
17. *C. arundinacea* (L.) Roth, 39, Abd. 1852, Euro-Sib.
18. *Agrostis stolonifera* L., 39, Abd. 1855.
19. *Phleum pratense* L., 31, Abd. 1621.
20. *P. exaratum* Hachst. ex Griseb, subsp. *exaratum*, 21, Abd. 1408.

21. *Festuca arundinacea* Schreber subsp. *arundinacea*, 33, Abd. 1676.
22. *F. woronowii* Hackel subsp. *caucasica* (St.-Yves) Markgr-Dannenb., 42, Abd. 1927, Ir.-Tur.
23. *F. chalcophaea* V. Krecz. & Bobrov subsp. *chalcophaea*, 31, Abd. 1620, Ir.-Tur.
24. *Poa trivialis* L., 16, Abd. 1275.
25. *P. longifolia* Trin., 18, Abd. 1244, Eux.
26. *P. bulbosa* L. var. *vivipara*, 16, Abd. 1238.
27. *Dactylis glomerata* L. subsp. *glomerata*, 31, Abd. 1618, 33, Abd. 1658.
28. *Sesleria phleoides* Steven ex Roemer & Schultes, 16, Abd. 1247.
29. *Glyceria plicata* (Fries) Fries, 34, Abd. 1758.
30. *Stipa hohenackeriana* Trin. & Rupr. var. *hohenackreiana*, 20, Abd. 1382, Ir.-Tur.
31. *Piptatherum coerulescens* (Desf.) P. Beauv., 33, Abd. 1657.
32. *Arundo donax* L., 24, Abd. 1468.
33. *Setaria viridis* (L.) P. Beauv., 35, Abd. 1766.
34. *Pennisetum orientale* L. C. M. Richard. 21, Abd. 1409.
35. *Sorghum halepense* (L.) Pers. var. *halepense*, 51, Abd. 1983.
36. *Bothriochloa ischaemum* (L.) Keng., 21, Abd. 1421, 35, Abd. 1768.
37. *Zea mays* L., 24, Abd. 1459.

Results and Discussion

At the end of the identification of the collected samples, 303 genera, 651 species, 20 subspecies and 11 varieties, as total 683 taxa have been established. Among the 683 taxa, two of them belong to Pteridophyta division and 681 of them belong to Spermatophyta division. In this division, Gymnospermae and Angiospermae have 5 and 676 taxa respectively. In Angiospermae, Dicotyledones include 517 taxa and Monocotyledones include 59 taxa.

Table 1. Life-forms in Uzundere (Kargapazari Mountains) and its surroundings.

Life-form	Number of species	Percentage (%)
Hemicryptphyte	362	53.1
Therophyte	117	17.1
Cryptophyte	89	13.1
Phanerophyte	78	11.4
Chamaephyte	36	5.3
Total	683	100

Life-forms in the study area are given in Table 1. It appears that hemicryptophytes (53.1 %) have the largest proportion in the total flora. The proportions of Therophytes, Cryptophytes, Phanerophytes and Chamaephytes are 17.1 %, 13.1 %, 11.4 % and 5.3 % respectively.

Table 2. Comparison of the distribution of the phytogeographical elements and the endemism with the result of the other nearest floristic studies.

RESEARCHES	1	2	3	4	5	6
TOTAL NUMBER OF SPECIES	683	476	1407	592	726	728
EURO-SIBERIAN (%)	17.8	10.95	8.0	12.9	29.6	15.1
IRANO-TURANIAN (%)	25.2	46.11	45.7	20.7	12.6	24.4
MEDITERRANEAN (%)	3.1	2.95	4.4	1.2	1.0	--
UNKNOWN (%)	53.3	39.99	41.9	55.5	56.8	60.2
ENDEMISMS (%)	11.5	13.65	19.9	5.3	2.7	4.4

RESEARCHES:

1. FLORA OF UZUNDERE (KARGAPAZARI MOUNTAINS) AND ITS SURROUNDINGS
2. FLORA OF TORTUM
3. FLORA OF MUNZUR MOUNTAINS (TUNCELİ/ERZİNCAN)
4. FLORA OF ALADAĞ
5. FLORA OF ÇİÇEK MOUNTAIN (ULGAR) AND ITS ENVIRONS
6. FLORA OF AKYAYA-ARPAÇAY (KARS)

Distribution of the phytogeographical elements in Kargapazarı Mountain and the comparison with other nearest studies are given in Table 2. Except the 5th study which is carried out in an area closer to Black Sea Region, the distribution of phytogeographical elements show correlation with all the studies. This is due to existence of the study area in East Anatolia which is under the effect of continental climate.

The rate of endemism in our research area is 11.5 % 43 of 78 endemic species are Irano-Turanian elements, 9 of them are Euxine elements, 1 of them is East-Mediterranean element and the other 25 are endemic to Turkey.

Table 3. Comparison of the largest 10 families with other neraset floristic studies.

RESEARCHES	Uzundere and its surrounding(Erz)	Tortum (Erzurum)	Munzur Dağları (Erzincan)	Aladağ Fiorası (Kars)	Çiçek Dağı (Posof/Kars)	Akyaka-Arpaçay (Kars)
	1	2	3	4	5	6
TOTAL TAXA	683	476	1407	592	734	728
FAMILY NAME	Asteraceae	Asteraceae	Asteraceae	Asteraceae	Asteraceae	Asteraceae
RATIO (%)	15.2	15.54	12.1	17.0	15.7	17.2
" "	Lamiaceae	Fabaceae	Brassicaceae	Brassicaceae	Fabaceae	Poaceae
" "	8.05	9.24	9.2	8.34	6.3	8.9
" "	Fabaceae	Lamiaceae	Fabaceae	Fabaceae	Lamiaceae	Fabaceae
" "	7.9	8.32	8.7	8.03	5.7	7.4
" "	Brassicaceae	Caryophyllaceae	Lamiaceae	Lamiaceae	Rosaceae	Caryophyllaceae
" "	7.8	6.3	7.2	6.77	5.3	7.3
" "	Poaceae	Poaceae	Caryophyllaceae	Caryophyllaceae	Scrophulariaceae	Lamiaceae
" "	5.4	6.3	5.7	6.45	5.1	6.2
" "	Rosaceae	Brassicaceae	Poaceae	Liliaceae	Brassicaceae	Scrophulariaceae
" "	4.7	6.09	5.0	4.72	4.7	4.9
" "	Caryophyllaceae	Boraginaceae	Boraginaceae	Rosaceae	Caryophyllaceae	Brassicaceae
" "	3.95	3.78	4.7	4.56	4.7	4.7
" "	Boraginaceae	Apiaceae	Liliaceae	Poaceae	Poaceae	Rosaceae
" "	3.66	3.57	4.3	4.09	4.5	3.7
" "	Scrophulariaceae	Rosaceae	Apiaceae	Apiaceae	Apiaceae	Boraginaceae
" "	3.66	2.94	4.2	3.93	4.2	3.7
" "	Liliaceae	Scrophulariaceae	Scrophulariaceae	Boraginaceae	Ranunculaceae	Liliaceae
" "	3.2	2.52	4.0	3.93	3.0	3.6

The largest 10 families are listed and compared with other studies in Table 3. As it can also be seen from the table, *Asteraceae* is the largest family. It is also the largest family in Turkey and the members of this have a wide range of ecological toleranca. *Laimaceae* is the second and the *Fabaceae* is the third family. They are also the third and second largest families of Turkey. *Brassicaceae*, which is another larger family of

Turkey, is the fourth one in our study area. *Poaceae* and *Rosaceae* which are the fifth and sixth largest families in the area, show a wide distribution in the tropical region of north hemisphere. *Caryophyllaceae*, *Boraginaceae*, *Scrophulariaceae* and *Liliaceae*, which are the seventh, eight, ninth and tenth families in the area, more or less have the same ranks in other studies.

Acknowledgement

The authors wish to thank "The Scientific and Technical Research Council of Turkey (TÜBİTAK) (TBAG AY-48)" and "Yüzüncü Yıl University Research Fund" for their financial supports.

References

1. Oltu Orman İşletme Müdürlüğü Amenajmar. Planları, Erzurum, 1972.
2. Akman, Y., Biyoklimatoloji Ders Notları, Ankara Üniv. Fen Fak. Botanik Bölümü, Ankara, 1982.
3. Akman, Y., İklim ve Biyoiklim, Palme Yayın Dağıtım, 68-83, 186-216, Ankara, 1990.
4. Davis, P., H., Turkey: Present State of Floristic Knowledge, Coll. Int. C.N.R.S. 235, La Flore du Bassin Mediterranean: Essai de Systematique Synthetique: 93-115, 1975.
5. Davis, P.H. and ed., Flora of Turkey and The East Aegean Islands, vols. 1-10, Edinburgh Univ. Press, Edinburgh, 1965-1988.
6. Ekim, T., Koyuncu, M., Erik, S. and İlarıslan, R., List of Rare, Threatend and Endemic, No: 18, Ankara, 1989.
7. Raunkiaer, C., The Life Forms of Plants and Statistical Plant Geography, Oxford, 1934.
8. Aksoy, A., Tortum Florası, Erzurum, 1989.
9. Demirkuş, N., Contributions To The Flora of Northeast Anatolia, YYÜ, Journal of Faculty of Education, Vo. 1, No 2, 103-127, 1996.
10. Yıldırım, Ş., Flora of Munzur Dağları (Erzincan-Tunceli), The Herb Journal of Systematic Botany, 2, 1, 1-78, 1995.
11. Demirkuş, N. and Erik, S., Çiçek Dağı (Ulğar) ve Çevresi'nin (Posof/Kars) Florası Üzerine Bir Araştırma, Hacettepe Fen ve Mühendislik Bilimleri Dergisi, Cilt 15, Seri A ve C, 1-47, 1994.
12. Güneş, O., Aladağ (Kars) Florası Üzerine Bir Araştırma, Doktora Tezi, Hacettepe Üniversitesi, Fen Fakültesi, Biyoloji Bölümü, Ankara, 1982.
13. Ocakverdi, H., Akyaka, Arpaçay, Melikköy ve Değirmenköprü Köyü Yaylaları (Kars) ile Sovyet Sınırı Arasında Kalan Bölgenin Florası, Doğa Bil. Der. Seri: A2, Cilt: 10, Sayı 3, 412-437, 1985.



HACETTEPE BULLETIN OF NATURAL SCIENCES AND ENGINEERING

An Annual publication

Volume 27 / 1998

Series A BIOLOGY and CHEMISTRY

ISSN 0072 - 9221

SAHİBİ
Hacettepe Üniversitesi
Fen Fakültesi Adına
Dekan

OWNER
On Behalf of Hacettepe
University Faculty of Science
Dean

ALİ KALAYCIOĞLU

EDİTÖR

EDITOR

GÜROL OKAY

ADVISORY BOARD

AYŞE BOŞGELMEZ
EMİR CANSUNAR
NEŞE ÇAĞATAY
ALİ DEMİR SOY
SADIK ERİK
FÜSUN ERK'AKAN
NAZİF KOLANKAYA
AY ÖĞÜŞ

SERDAR ATEŞ
ADIL DENİZLİ
MEHMET DOĞAN
YAVUZ İMAMOĞLU
ERHAN PIŞKIN
ATTILAYILDIZ

CONTENTS

Biology

Series A

- N. M. PINAR, Ö. İNCEOĞLU
Pollen Morphology Of Some Chenopodiaceae: I. *Atriplex* L.....1
- N. M. PINAR, Ö. İNCEOĞLU
Pollen Morphology Of Some Turkish Chenopodiaceae: II. *Suaeda* L.
.....15
- A. KAYA, N. DEMİRKUŞ
A Research On The Flora Of Uzundere (Kargapazarı Mountains
Erzurum) And Its Surroundings27
- S. YERLİ, N. EMİR AKBULUT, A. AKBULUT
The Observation Aquatic Parameters Of Çıldır Lake67
- F. GEYİKOĞLU, A. ÖZKARAL
Postnatal Growth Of Muscles Pectoralis Major Fibres Of *Guinea* Pig
.....79

Chemistry

Series A

- A. SÖKMEN, M. SÖKMEN
Bioactive Chemicals From Cell Suspension Cultures Of *Hypericum*
Capitatum Var. *Capitatum*89
- M. SÖKMEN, D.W. ALLEN, A.T. HEWSON, M.R. CLENCH
Fenton And Related Oxidation Reactions Of Methylthiophenes 101

The Hacettepe Bulletin of Natural Sciences and Engineering publishes short to medium length research papers written in English on Biology and Chemistry (Series A), Mathematics and Statistics (Series B).

Address for Correspondence

Hacettepe Fen ve Mühendislik Bilimleri Dergisi Danışma Kurulu Başkanlığı,
Hacettepe Üniversitesi, Fen Fakültesi, 06532, Beytepe, Ankara , Türkiye.

E-mail: hdergi @hun.edu.tr

Fax : 0 90 312 299 20 80

20 offprints will be provided free of charge to author(s) and additional offprints (20 at minimum) can be purchased at cost price per offprint (1-4 pp: 4 \$; 5-8 pp: 8 \$; postage additionally) and must be prepaid.

Subscription Orders should be placed with Dr. Gürol Okay Editör - in - Chief. Airmail delivery surcharge rates to other countries are available on request. Claims for undelivered issues must be made promptly - at the very latest, immediately following receipt of the issue succeeding the missing number.

Publication Charge

A page charge of 3 \$ per page will be assessed uniformly for the publication of each manuscript. The author(s) must pay the charge to Ziraat Bankası Beytepe Şubesi 30459/225151. or in \$ to 944-173947. Check in not accepted.

Editorial Information

Papers and correspondence should be sent to Dr. Gürol Okay, Editor - in - Chief.

The manuscripts should be submitted until 26th May.

Authors receive an acknowledgement of receipt of their paper together with a notification of acceptance or rejection within 3 months.

Hacettepe Bulletin of Natural Sciences and Engineering

Series A, is an international journal for communication in the fields of chemistry and biology. The aim of the journal is to inform its readers *quickly* and in a *condensed* form about the latest findings and developments in this fast-growing field. Only original papers will be considered for publication. The " Instructions for Authors " should be followed exactly. Every effort will be made to get the submitted manuscripts rapidly refereed by experts of the respective area of research