

## The Flora of Lower Parts of Melet River (Ordu)

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### Abstract

This study concerns the flora of the Melet River. According to grid system of Davis, the west side of Melet River is located within the A6 and east side is located within A7 square. At the end of study 190 taxa belong to 136 genera and 59 families were determined. The distribution of the taxa phytogeographical regions are as follows; Euro-Siberian elements 37 (19,38%), Mediterranean elements 5(2,63%), Irano-Turanien elements 7(3,68%) and pluriregionals 137(72,1%). Endemism rate is 0,031 (% 3,1) with 6 plants in the area.

**Key Words:** Flora, Melet River, Ordu province

### INTRODUCTION

The Melet River is located in Ordu province and mainly in the Euxine province of Euro-Siberian phytogeographical region. The Black Sea Region is divided to two subregions as Euxine and Colchic sectors. Our research area is very important as both ecologically and phytogeographically due to a transitional area between Colchic and Euxine floristic subregions [1]. Ordu city lies approximately at latitude 41° 18'N and longitude 37°52' E. The main rivers of Ordu city are Turnasuyu, Melet, Civil, Akçaova, Ilıca, Bolaman, Elekçi, Cevizdere, Curi and Akçay (east to west). The longest river is Melet among these rivers with its 125km.

The study area lies between A6 and A7 squares according to Davis [2]'s grid system. Characters of soil in the study area are clayey- loamy, slight alkaline and poor in organic matter [3]. The area has an oceanic climate with an average temperature of 19°C and annual precipitation of 1145,5 mm [4].

Aim of our study is to contribute the knowledge about Ordu's flora. The study area has interesting feature in that it is transition zone in terms of floristic region. No specific studies have previously been conducted in this area in point of floristic aspects. However, some floristic studies have been carried out near the vicinity of the study area [5,6,7,8]. Two of them was related to the flora of Ordu city [7,8], the others were related to vegetational properties of Ordu area.

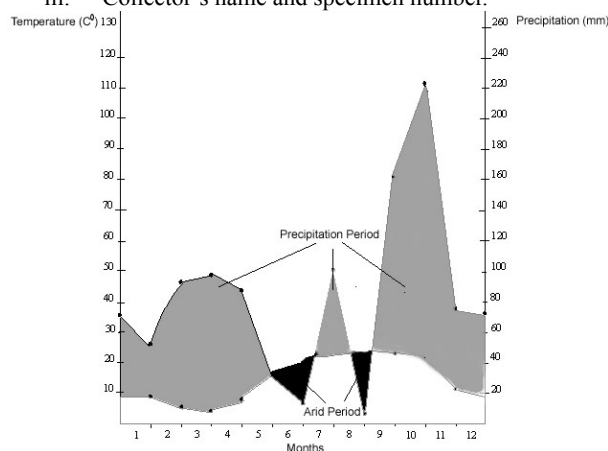
### MATERIALS and METHODS

Plant species were collected from 10 km distance from the sea level between 2003 and 2004 years. It was taken into account that the specimens including both flowers and fruits to provide the identifying of the specimens without any problem. The plant samples were prepared according to established herbarium techniques. All specimens are kept at the Herbarium of Ondokuz Mayıs University (Samsun). The

specimens were identified by help of Flora of Turkey and the East Aegean Island [2, 9, 10]. Taxonomic nomenclature was followed that of Brummitt and Powell [11]. Phytogeographical regions were determined according to Flora of Turkey [2]. In order to calculate the distribution of the species according to phytogeographical regions total number of plant species which belong to a certain phytogeographical region were divided by the total number of taxa. The taxa are listed in the appendix. Taxonomic categories in main groups such as families, genera and species are similarly arranged in evolutionary sequence ie. Ferns, Gymnosperms, dicots and monocots sequences. Cultivated plants are also indicated in parentheses at the end of plant number.

All taxa at level of specific and infra specific ranks in the list are represented in following order;

- The names and authors of species, subspecies and varieties.
- Collection date of specimens.
- Collector's name and specimen number.



**Figure 1.** A climatic diagram of the study area

iv. Endemism and phytogeographical status of taxa are stated.

Abbreviations used in the appendix are as follows: Euro-Siberian element: Euro.-Sib.el; Mediterranean element: Medit. el.; East Mediterranean element: E. Medit.; Irano-Turanian element: Ir.-Tur. el.; Hyrcano-Euxine element: Hyr. Eux.; Euxine: Eux.

Climatological data were obtained from Ordu Meteorological station. The climatic diagram of the study area is drawn according to the observed data (Figure 1).

## RESULTS

As a result of identification of the plant specimens, 59 families, 136 genera, 186 species, 2 subspecies and 2 varieties were determined. The total number of taxa (species, subspecies and varieties) is 190. Four of 190 species are belong to the *Pteridophyta* and the other 186 species are belonging to the *Spermatophyta*. Four species of them are belong to *Gymnospermae* and the others (182 species) are belong to *Angiospermae* subdivision. Twelve species are belonging to *Liliopsida (Monocotyledoneae)*, while the others are (170) belong to classis *Magnoliopsida (Dicotyledoneae)*.

Distribution of the species in the study area are as follows: Euro-Siberian elements 28 (14,65%), Hyrcano-Euxine elements 1(0,52%) and Euxine elements 8(4,21%), Mediterranean elements 5 (2.63%), Irano-Turanian elements 7 (3,68%) and pluriregionals and unknown 137 (72,1%) (Table 1). There are six endemic taxa (2,1%) in the study area, *Abies nordmanniana* (Stev.) Spach subsp. *bornmuelleriana* (Mattf.) Coode & Cullen and *Heracleum platytaenium* Boiss. are Euxine elements. *Silene capitellata* Boiss. and *Thymus leucostomus* Hausskn & Velen var. *leucostomus* are Irano-Turanian elements. The other endemic species are *Tragopogon aureus* Boiss. and *G. margaceum* Ehrend. & Schönb.-Tem.

**Table 1.** A comparison of the distribution and endemism rates (%) of species over the floristic regions in the study area with some studies performed in nearby areas.

Phytogeographical regions	Present study	Kılınc (1985)	Kutbay (1995)	Korkmaz (2001)	Özen (1995)	Eminağaoğlu (2008)
Euro-Siberian	14,65	32,04	17,02	12,40	20,75	48,2
Euxine	4,21	3,90	7,52	3,83	-	-
Hyrcano-Euxine	0,52	1,50	0,65	0,68	-	-
Mediterranean	2,63	11,77	9,65	9,74	13,79	1,9
Irano-Turanian	3,68	23,88	2,29	11,31	4,32	3,5
Pluriregionals	72,1	1,50	0,81	50,29	54,95	46,4
Endemic	3,1	2,00	3,43	10,43	5,18	2,3

**Table 2.** Genera totals of the common families in the study area

Families	Genera Numbers
Leguminosae (Fabaceae)	30
Compositae (Asteraceae)	27
Labiatae (Lamiaceae)	20
Cruciferae (Brassicaceae)	12
Caryophyllaceae	11
Umbelliferae (Apiaceae)	8
Graminae (Poaceae)	5

**Table 3.** Species totals of the common genera in the study area.

Genera	Taxon Numbers
Trifolium	8
Vicia	6
Geranium	6
Silene	4

The largest families in terms of number of genera are Leguminosae (Fabaceae) 30, Compositae (Asteraceae) 27, Labiatae (Lamiaceae) 20, Cruciferae (Brassicaceae) 12, Caryophyllaceae 11, Umbelliferae (Apiaceae) 8 and Gramineae (Poaceae) 5 in the study area (Table 2). *Trifolium* 8 and *Vicia* 6, *Geranium* 6 and *Silene* 4 are the largest four genera in the study area (Table 3).

## DISCUSSION

The research area is basin of Melet River. Vegetation types in the study area are forests, shrubs, hazelnut grove, fallow fields and streams. *Pinus sylvestris* L. is a dominant species of the forest vegetation. Shrub vegetation is characterised by *Crataegus monogyna* Jacq., *Salix alba* L. and *Geranium sylvaticum* L. are commonly found along the stream vegetation.

According to the climatic diagram an arid period was found in the study area from June to August thus aridity was not severe. Except for this short dry period the climate is rather humid (Figure 1). Based on Emberger's precipitation-temperature scale, AWSS (autumn-winter-summer-spring) precipitation regime is present in Ordu province. Such precipitation regime states an oceanic precipitation regime. Two main precipitation regime types are seen as Eastern and Western Black Sea Region in Black Sea Region. In our study area Eastern Black Sea Region 1<sup>st</sup> type oceanic precipitation regime is seen [12].

Endemism rate is very low in our study area. The most important cause of this situation is high climatic and edaphic similarity in the study area. In addition to this, the study area is near to the sea level and topographic structure of the study area is rather homogeneous. It has long been known that endemism rate affected by climatic, edaphic and topographic factors and endemism rate is rather low near to the sea level regions due to low climatic and edaphic diversity [13].

When the phytogeographic distribution is taken into consideration, the high number of the Euro-Siberian elements is not surprising because the study area is situated in the Euro-Siberian region. Additionally, according to the precipitation-temperature coefficient of Emberger Mediterranean climate is also seen in the region locally. Irano-Turaniaen and Mediterranean element is occurred in Black Sea Region interruptively except for Eastern Black Sea Region. Irano-Turanian elements are especially found at higher parts of the study area due to continental climate.

The comparison among our study and other studies are given in Table 1. When the results of this study is compared with the studies of Kılınc, Kutbay et.al., Korkmaz, Özen and Eminağaoğlu [14, 15, 16, 17, 18], the ratio of Euro-Siberian elements is also high in other studies. The ratio of Euxine elements in the study present is similar to the study of Kılınc

[14] and Korkmaz [16] while the ratio of Hyrcano-Euxine elements and Mediterranean elements are very similar to the study of Kutbay et.al. and Korkmaz [1,16]. However, the rate of Irano-Turanian elements is similar to the study of Kutbay and Özen [13,17, 18] while the ratio of endemic species is similar to the study of Kılınç, Kutbay and Eminağaoğlu [14, 15, 18] (Table 1).

The study area is very poor floristically among to other regions of Turkey. Many characteristic species for Black Sea Region were not found in relation to similar regions[14] because severe destruction in the area due to over-grazing and "construction sites" around the study area only includes the lower most part of Melet River region. The lower most part of Melet River is dried day by day owing to heavy distribution. One of the most important signs of severe destruction is high number of pluriregionals as compared to similar regions. Most of the characteristic species belong to Euro-Siberian region Euxine subregion in general.

In the study area, agricultural facilities especially hazelnut farming is performed. So that the number of natural plant species is comparatively rare except along the riverbanks and streams. Tree and shrub plant species such as *Salix*, *Alnus*, *Sambucus* and *Rubus* are seen along the riversides and stream banks. In the empty places among the hazelnut gardens occupied by *Arum italicum*. The vegetation can be damaged by some factories in the neighborhood and some improvement studies in the region. Owing to these factors the number of pluriregionals is very high. However, high precipitation level in the study area can contribute to refresh the damaged vegetation. The plant specimens collected in the study area may also been used as an historical record in the future because the study area may be completely distributed due to urbanization.

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## APPENDIX

### Floristic List

The sequence of families, genera and species in the following list follows the system adopted in the Flora of Turkey.

#### PTERIDOPHYTA

#### EQUISETACEAE

*Equisetum hyemale* L.

A6 Ordu: Memişli district, 60 m, stream side, wet places, 60 m, 21.04. 2003, Özbucak, 1218.

*E. telmateia* Ehrn.

A6 Ordu: Kurdan district, stream side, 10 m, 21.04. 2003, Özbucak 1265.

#### ADIANTACEAE

*Adiantum capillus-veneris* L.

A7 Ordu: Akçatepe village, under forest, 60 m, 07.11. 2004, Özbucak 1491.

#### HYPOLEPIDACEAE

*Pteridium aquilinum* (L.) Kuhn

A6 Ordu: Memişli district, dunes, 60 m, 06.04.2003, Özbucak 1213.

## SPERMATOPHYTA

### GYMNOSPERMAE

#### PINACEAE

*Abies nordmanniana* (Stev.) Spach subsp. *bornmuelleriana* (Mattf.) Coode & Cullen

A6 Ordu: İncirli district, 60 m, 27.04. 2004, Özbucak 1303, Euro.-Sib.el. (Eux.), Endemic.

*Pinus sylvestris* L.

A6 Ordu: Kadioğlu district, forest, 100 m, 27.04. 2004, Özbucak 1305, Euro.-Sib. el.

#### CUPRESSACEAE

*Cupressus sempervirens* L.

A6 Ordu: Kadioğlu district, rocky, 100 m, 27.04. 2004, Özbucak 1308, Medit. el. (cultured).

## ANGIOSPERMAE

### DICOTYLEDONEAE

#### RANUNCULACEAE

*Helleborus orientalis* Lam.

A6 Ordu: Bölükbaşıoğlu district, shrubby, 30 m, 18.04. 2004, Özbucak 1288, Eux. el.

*Clematis vitalba* L.

A6 Ordu: Karapınar district, shrubby and hazelnut grove, 80 m, 21.04. 2003, Özbucak 1228 .

*Ranunculus constantinopolitanus* (DC.) d' Urv.

A6-A7 Ordu: Kurdan district- Çiftlik district, roadside-edges of fields 10-100 m, 06.04. 2004-18.04. 2004, Özbucak 1201-1409, Euro.-Sib.el.

*R. chius* DC.

A6 Ordu: Kurdan district, shrubby, 10 m, 18.03. 2004, Özbucak, 1281, Medit. el.

*Ceratocephalus falcatus* (L.) Pers.

A6 Ordu: Karapınar district, edges of hazelnut grove, 80 m, 21.03. 2004, Özbucak 1416.

#### PAPAVERACEAE

*Chelidonium majus* L.

A6 Ordu: Karamahmut district, under forest, 90 m, 27. 04. 2004, Özbucak 1307, Euro.-Sib. el.

*Papaver rhoeas* L.

A6-A7 Ordu: Kuru hüseyinoğlu - Kadioğlu districts, edges of hazelnut grove, 90 m- 100 m, 21.04. 2003-27.04. 2004, Özbucak 1220-1492.

#### CRUCIFERAE (BRASSICACEAE )

*Sinapis arvensis* L.

A6-A7 Ordu: Kayabaşı - Kadioğlu, field and road sides, 60 -100 m, 06.04. 2003- 21.04. 2003, Özbucak 1204-1417.

*Raphanus raphanistrum* L.

A6 Ordu: Bölükbaşıoğlu district, edges of fields, 30 m, 06.04. 2003, Özbucak 1212.

*Thlaspi perfoliatum* L.

A6-A7 Ordu: Kurdan - Çiftlik districts, hazelnut grove- roadside, 10 m, 06.04. 2003-21.04. 2003, Özbucak 1210-1418.

*Erophila verna* (L.) Chevall. subsp. *verna*

A7 Ordu: Oskara district, waste places, 130 m, 21.03. 2004, Özbucak 1419.

*Capsella bursa-pastoris* (L.) Medik.

A6-A7 Ordu: Kuru hüseyinoğlu - Kayabaşı districts, 60 - 90 m, hazelnut grove- waste places, 06.04. 2003- 18.03. 2004, Özbucak 1200-1450.

*Cardamine quinquefolia* (Bieb.) Schmalh.

A6 Ordu: Memişli district, roadside, 60 m, 06.04. 2003, Özbucak 1205, Euro.-Sib.el.

*C. lazica* Boiss.& Bal.

A6 Ordu: Memişli district, roadside, 60 m, 18.03. 2004, Özbucak 1285, Eux. el.

*Alliaria petiolata* (Bieb.) Cav.& Grande.

A6 Ordu: Terzili district, field, 60 m, 27.04. 2004, Özbucak 1304.

*Sisymbrium altissimum* L.

A6 Ordu: İncirli district, edges of hazelnut grove, 130 m, 18.03. 2004, Özbucak 1283.

#### RESEDACEAE

*Reseda lutea* L. var. *lutea*

A6 Ordu: Karamahmut district, 90 m, roadside and fields, 21.04. 2003, Özbucak 1217.

#### VIOLACEAE

*Viola sieheana* Becker

A6 Ordu: Kurdan district, rocky places, 10 m, 18.03. 2004, Özbucak 1295.

#### CARYOPHYLLACEAE

*Cerastium anomalum* Waldst .& Kit

A7 Ordu: Yeniköy district, meadow, 30 m, 18.03.2004, Özbucak 1300, Euro.-Sib.el.

*C. glomeratum* Thuill.

A7 Ordu: Kayabaşı district, cultivated places, 60 m, 02.04. 2004, Özbucak 1427.

*Holosteum umbellatum* L. var. *umbellatum*

A7 Ordu: Oskara district, open places, 130 m, 02.04. 2004, Özbucak 1428.

*Velezia rigida* L.

A7 Ordu: Oskara district, under shrubby, 130 m, 02.04. 2004, Özbucak 1429.

*Silene italica* L.

A6 Ordu: Kadioğlu district, hazelnut grove, 100 m, 21.04. 2003, Özbucak 1262.

*S. capitellata* Boiss.

A6 Ordu: Karapınar district, meadow, 80 m, 02.05. 2003, Özbucak 1430, Ir.-Tur. el. Endemic.

*S. compacta* Fischer

A6 Ordu: Karapınar district, hazelnut grove, 80 m, 06.04. 2003, Özbucak 1214, Medit. el.

*S. alba* Miller (Krause) subsp. *divaricata* (Reichb.) Walters

A6 Ordu: Karapınar district, edges of field, 80 m, 21.04. 2003, Özbucak 1219.

*S. dichotoma* Ehrh. subsp. *dichotoma*

A6 Ordu: Kadioğlu district, hazelnut grove, 100 m, 27.04. 2004, Özbucak 1317.

*Agrostemma githago* L.

A7 Ordu: Oskara district, corn field, 130 m, 31.05. 2004, Özbucak 1438, Medit. el.

#### POLYGONACEAE

*Polygonum lapathifolium* L.

A6 Ordu: Memişli district, meadow, 60 m, 23.09. 2003, Özbucak 1280.

*P. setosum* Jacq.

A7 Ordu: Kuruhüseyinoğlu district, edges of field, 90 m, 09.07. 2004, Özbucak 1451, Ir.-Tur. el. *P. luzuloides* Jaub. & Spach

A7 Ordu: Yukarıtepe village, field, 100 m, 2.05. 2004, Özbucak 1431, Ir.-Tur. el.

*Rumex crispus* L.

A6-A7 Ordu: Kayabaşı - Oskara districts, waste places, 60 - 130 m, 23.09. 2003, Özbucak 1277-1410.

*R. conglomeratus* Murr.

A6 Ordu: İncirli district, edges of fields, 130 m, 27.04. 2004, Özbucak 1301.

#### CHENOPODIACEAE

*Chenopodium album* L.

A6 Ordu: Memişli district, cultivated land, 60 m, 23.09. 2003, Özbucak 1278.

*Salicornia prostrata* Pall.

A7 Ordu: Yukarıtepe village, marshes, 100 m, 07.09. 2004, Özbucak 1493.

#### AMARANTHACEAE

*Amaranthus retroflexus* L.

A7 Ordu: Yeniköy, edges of field, 30 m, 09.07. 2004, Özbucak 1459.

*A. albus* L.

A7 Ordu: Çiftlik district, edges of field, 10 m, 08.11. 2003, Özbucak 1400.

#### PHYTOLACCACEAE

*Phytolacca americana* L.

A6 Ordu: Karapınar, shrubby, 80 m, 21.06. 2003, Özbucak 1253.

#### TAMARICACEAE

*Tamarix smyrnensis* Bunge

A6 Ordu: Memişli district, wet places, 60 m, 21.06. 2003, Özbucak 1245.

#### HYPERICACEAE (GUTTIFERAE)

*Hypericum perforatum* L.

A6 Ordu: Terzili district, roadside, 60 m, 21.06. 2003, Özbucak 1249.

*H. scabrum* L.

A7 Ordu: Kuruhüseyinoğlu district, meadow, 90 m, 9.07. 2004, Özbucak 1452, Ir.-Tur. el.

*H. triquetrifolium* Turra

A7 Ordu: Kuruhüseyinoğlu district, hazelnut grove, 90 m, 10.10. 2004, Özbucak 1477.

#### MALVACEAE

*Malva sylvestris* L.

A6 Ordu: Kurdan district, fields, 10 m, 26.12. 2003, Özbucak 1412.

*M. neglecta* Wallr

A7 Ordu: Kayabaşı district, meadow, 60 m, 21.06. 2003, Özbucak 1234.

*Lavatera bryoniifolia* Mill.

A6 Ordu: İncirli district, rocky, 130 m, 21.06. 2003, Özbucak 1236, Medit. el.

#### GERANIACEAE

*Geranium rotundifolium* L.

A7 Ordu: Yukarıtepe village, roadside, 100 m, 31.05. 2004, Özbucak 1439.

*G. molle* L.

A6 Ordu: Memişli district, rocky places, 60 m, 21.06. 2003, Özbucak 1241.

*G. dissectum* L.

A7 Ordu: Çiftlik district, wet places, 10 m, 02.05. 2004, Özbucak 1431.

*G. sylvaticum* L.

A7 Ordu: Yeniköy, wet places, 30 m, 27.04. 2004, Özbucak 1316, Euro.-Sib. el.

*G. asphodeloides* Burm.

A6-A7 Ordu: Akçatepe village- Memişli district, meadows, 60 - 30 m, 27.04. 2004 - 06.04. 2003, Özbucak 1315-1440.

*G. rotundifolium* L.

A7 Ordu: Kuruhüseyinoğlu district, edges of hazelnut grove, 90 m, 31.05. 2004, Özbucak 1439.

*Erodium acaule* (L.) Becherer & Thell.

A7 Ordu: Kayabaşı district, roadsides, 60 m, 31.05. 2004, Özbucak 1441, Medit. el.

#### OXALIDACEAE

*Oxalis acetosella* L.

A6 Ordu: Terzili district, cultivated lands, 60 m, 21.04. 2004, Özbucak 1216.

#### ACERACEAE

*Acer campestre* L. subsp. *campestre*

A7 Ordu: Oskara district, edges of road, 130 m, 08.11. 2003, Özbucak 1401, Euro.-Sib. el.

#### RHAMNACEAE

*Paliurus spina-christi* Mill.

A7 Ordu: Çiftlik district, wet places, 10 m, 09.07. 2004, Özbucak 1453.

#### ANACARDIACEAE

*Rhus coriaria* L.

A7 Ordu: Oskara district, shrubby, 130 m, 09.07. 2004, Özbucak 1454.

#### CELASTRACEAE

*Euonymus latifolius* (L.) Mill.

A7 Ordu: Kuruhüseyinoğlu district, shrubby, 90 m, 27.04. 2004, Özbucak 1318.

#### LEGUMINOSAE(FABACEAE)

*Robinia pseudoacacia* L.

A6 Ordu: Karapınar district, meadow, 80 m, 21.06. 2003, Özbucak 1256 (cultured).

*Galega officinalis* L.

A6 Ordu: Akçatepe village, edges of field, 10 m, 18.03. 2003, Özbucak 1328.

*Colutea cilicica* Boiss. et Bal.

A7 Ordu: Kayabaşı district,, shrubby, 60 m, 10.10. 2004, Özbucak 1478.

*Vicia cracca* L.

A6 Ordu: Akçatepe village, hazelnut grove, 10 m, 27.04. 2004, Özbucak 1309.

*V. cracca* L. subsp. *cracca*

A7 Ordu: Yukaritepe village, roadside, 100 m, 09.04. 2004, Özbucak 1455, Euro.-Sib. el.

*V. cracca* L. subsp. *stenophylla* Vel.

A7 Ordu: Oskara district, shrub, 130 m, 09.07. 2004, Özbucak 1456.

*V. galeata* Boiss.

A7 Ordu: Yeniköy, wet places, 30 m, 02.05. 2004, Özbucak 1432.

*V. sativa* L. subsp. *sativa*

A7 Ordu: Yeniköy, corn field, 30 m, 08.11. 2003, Özbucak 1403.

*V. sativa* L. subsp. *nigra* (L.) Ehrh. var. *nigra*

A7 Ordu: Oskara district, hazelnut grove, 130 m, 08.11. 2003, Özbucak 1404.

*V. sativa* L. subsp. *nigra* (L.) Ehrh. var. *segetalis* (Thuill) Ser. ex DC.,

A7 Ordu: Oskara district, field, 130 m, 10.10. 2004, Özbucak 1479.

*Lathyrus inconspicuus* L. var. *inconspicuus*

A7 Ordu: Kayabaşı district, corn field, 60 m, 02.05. 2004, Özbucak 1433.

*Lathyrus annuus* L.

A6 Ordu: İncirli district, meadow, 130 m, 21.04. 2003, Özbucak 1225.

*Lathyrus cicera* L.

A7 Ordu: İncirli district, corn fields, 130 m, 08.10. 2003, Özbucak 1405.

*Trifolium nigrascens* Viv. subsp. *petrisavii* (Clem.) Holmboe

A7 Ordu: Yukaritepe village, meadow, 100 m, 09.07. 2004, Özbucak 1457.

*T. speciosum* Willd.

A7 Ordu: Çiftlik district, field, 10 m, 02.05. 2004, Özbucak 1434.

*T. campestre* Schreb.

A7 Ordu: Çiftlik district, field, 10 m, 31.05. 2004, Özbucak 1442.

*T. fragiferum* L. var. *fragiferum*

A6 Ordu: Kurdan district, field, 10 m, 21.04. 2003, Özbucak 1226.

*T. fragiferum* L. var. *Pulchellum* Lange

A7 Ordu: Çiftlik district, edges of field, 10 m, 31.05. 2004, Özbucak 1443.

*T. resupinatum* L. var. *resupinatum*

A7 Ordu: İncirli district, roadside, 130 m, 31.05. 2004, Özbucak 1444.

*T. canescens* Wild.

A6-A7 Ordu: Memişli district- Akçatepe village, wet places, 60 m, 06.04. 2003- 21.04. 2003, Özbucak 1203-1423, Hyr. Eux. el.

*Medicago orbicularis* (L) Bart.

A6 Ordu: Bölükbaşı district, meadow, 30 m, 21.04. 2003, Özbucak 1251.

*Coronilla varia* L.

A6-A7 Ordu: Karapınar district- Yukaritepe village, shrubby, 80 -100 m, 21.06. 2003, Özbucak 1259-1459.

#### ROSACEAE

*Laurocerasus officinalis* Roemer

A6 Ordu: Terzili district, shrubby, 60 m, 18.03. 2004, Özbucak 1299.

*Rubus discolor* Weihe & Ness,

A6 Ordu: Memişli district, shrubby, 60 m, 21.06. 2003, Özbucak 1255.

*Sanguisorba minor* Scop.

A6-A7 Ordu: Karapınar - Akçatepe districts, shrubby, 80 - 60 m, 27.04. 2004- 06.04. 2003, Özbucak 1323-1482.

*Rosa canina* L.

A6 Ordu: İncirli district, wet places, 130 m, 06.08. 2003, Özbucak 1266-1482.

*Crataegus monogyna* Jacq.

A6 Ordu: Karamahmut district, shrubby, 60 m, 27.04. 2004, Özbucak 1322.

*Potentilla reptans* L.

A7 Ordu: Oskara district, wet places, 130 m, 31.05. 2004, Özbucak 1446.

#### LYTHRACEAE

*Lythrum salicaria* L.

A6 Ordu: Kurdan district, edges of field , 10 m, 18.03. 2004, Özbucak 1282, Euro.-Sib. el.

#### ONAGRACEAE

*Epilobium angustifolium* L.

A6 Ordu: Terzili district, edges of hazelnut grove, 60 m, 21.06. 2003, Özbucak 1244.

#### CUCURBITACEAE

*Bryonia aspera* Stev. ex Ledeb

A6 Ordu: Memişli district, shrubby, 60 m, 06.08. 2003, Özbucak 1271.

#### CRASSULACEAE

*Sedum album* L.

A6 Ordu: Kadioğlu district, stony places, 100 m, 21.08. 2003, Özbucak 1238.

#### UMBELLIFERAE (APIACEAE)

*Chaerophyllum temulum* L.

A7 Ordu: Yukaritepe village, meadow, 100 m, 09.08. 2004, Özbucak 1462, Euro.-Sib. el.

*Pimpinella peregrina* L.

A7 Ordu: Oskara district, field, 130 m, 9.08. 2004, Özbucak 1463.

*Heracleum platytaenium* Boiss.

A6 Ordu: Karpınar district, shrub, 130 m, 6.08. 2003, Özbucak 1267, Eux. el. , Endemic.

*Torilis leptophylla* (L.) Reichb.

A7 Ordu: Kayabaşı district, stream side, 60 m, 31.05. 2004, Özbucak 1447.

*Orlaya grandiflora* (L.) Hoffm.

A6 Ordu: Memişli district, field, 60 m, 21.06. 2003, Özbucak 1260.

*Daucus carota* L.

A6 Ordu: Memişli district, meadow, 60 m, 21.06. 2003, Özbucak 1243.

#### ARALIACEAE

*Hedera helix* L.

A6 Ordu: Kurdan district, climbing over trees, 10 m, 18.03. 2004, Özbucak 1291.

#### CAPRIFOLIACEAE

*Sambucus ebulus* L.

A6 Ordu: İncirli district, roadside, 130m, 21.06. 2003, Özbucak 1240, Euro.-Sib. el.

#### COMPOSITAE (ASTERACEAE)

*Xanthium strumarium* L. subsp. *strumarium*

A6 Ordu: Kadioğlu district, clearing places, 100 m, 21.06. 2003, Özbucak 1233.

*Inula graveolens* (L.) Desf.

A6 Ordu: Bölükbaşıoğlu district, stream side, 30 m, 21.06. 2003, Özbucak 1258.

*Pulicaria dysenterica* (L.) Bernnh..

A6-A7 Ordu: Bölükbaşıoğlu - Akçatepe districts, river bank, 30- 60 m, 21.04. 2003, river bank, Özbucak 1230-1494.

*Logfia arvensis* (L.) Holub

A6 Ordu: Karamahmut district, roadside and shrubby, 60 m, 06.08. 2003, Özbucak 1273.

*Bellis perennis* L.

A6-A7 Ordu: Kurdan district, hazelnut grove, 10 m, 18.03. 2004, Özbucak 1294-1464, Euro.-Sib. el.

*Senecio aquaticus* Hill. subsp. *erraticus* (Bertol) Mathewes

A6 Ordu: Karapınar district, clearing, 80 m, 18.03. 2004, Özbucak 1289, Euro.-Sib.el.

*S. vulgaris* L.

A6-A7 Ordu: Memişli - Oskara districts, field- roadside, 60 - 130 m, 21.04. 2003- 06.04. 2003, Özbucak 1227-1465.

*Calendula arvensis* L.

A7 Ordu: Kayabaşı district, roadsides and cultivated field, 60 m, 26.12. 2003, Özbucak 1414.

*Eupatorium cannabinum* L.

A6 Ordu: Terzili district, meadow, 60 m, 21.04. 2003, Özbucak 1231, Euro.-Sib. el.

*Anthemis tinctoria* L. var. *tinctoria*

A6-A7 Ordu: Memişli district, edges of field, 60 m, 21.06. 2003, Özbucak 1237-1466.

*Tanacetum partenium* (L.) Schultz Bip.

A6 Ordu: Kadioğlu district, stream side, 100 m, 06.04. 2003, Özbucak 1209.

*Matricaria chamomilla* L. var. *recutita* (L.) Grierson

A7 Ordu: İncirli district, roadside, 130 m, 06.08. 2003, Özbucak 1495.

*Artemisia vulgaris* L.

A6 Ordu: Bölükbaşıoğlu district, stream side, 30 m, 06.08. 2003, Özbucak 1268.

*Cirsium ligulare* Boiss.

A6 Ordu: Memişli district, waste places, 60 m, 21.06. 2003, Özbucak 1247.

*C. arvense* (L.) Scop. subsp. *vestitum* (Wimmer & Grab.) Petrak

A7 Ordu: Yukaritepe village, field, 100 m, 10.10. 2004, Özbucak 1483.

*Centaurea solstitialis* L. subsp. *solstitialis*

A7 Ordu: Oskara district, waste places, 130 m, 31.05. 2004, Özbucak 1448.

*C. iberica* Trev. Ex Sprengel

A6 Ordu: Kurdan district, roadside, 10 m, 27.04. 2004, Özbucak 1329.

*Xeranthemum annuum* L.

A7 Ordu: Yeniköy, dune, 30 m, 09.07. 2004, Özbucak 1467, Ir.-Tur. el.

*Cichorium intybus* L.

A6 Ordu: Karamahmut district, roadside, 60 m, 23.09. 2003, Özbucak 1279.

*Tragopogon aureus* Boiss.

A6 Ordu: İncirli district, hazelnut grove, 130 m, 21.06. 2003, Özbucak 1257, Endemic.

*Mycelis muralis* (L) Dum.

A6 Ordu: Kadioğlu district, rocks, 100 m, 21.04. 2003, Özbucak 1229, Euro.-Sib.el.

*Taraxacum macrolepium* Schischkin

A6-A7 Ordu: Karapınar - Kayabaşı districts, roadside, 80 m- 60 m, 06.04. 2003-27.04. 2004, Özbucak 1326-1496.

#### CAMPANULACEAE

*Campanula glomerata* L. subsp. *hispida* (Witasek) Hayek

A7 Ordu: Karamahmut district, roadside, 60 m, 09.08. 2004, Özbucak 1468, Euro.-Sib. el.

#### PRIMULACEAE

*Primula vulgaris* Huds. subsp. *sibthorpii* Hoffmanns

A6 Ordu: Kurdan district, meadow, 10 m, 18.04. 2004, Özbucak 1290, Eux. el.

*Cyclamen coum* Mill. var. *coum*

A6 Ordu: Kurdan district, field, 10 m, 18.03. 2004, Özbucak 1287.

#### EBENACEAE

*Diospyros lotus* L.

A7 Ordu: Kuruhüseyinoğlu district, cultivated land, 90 m, 06.08. 2003, Özbucak 1274.

#### APOCYNACEAE

*Vinca major* L. subsp. *hirsuta*

A6 Ordu: Terzili district, roadside, 60 m, 27.04. 2004, Özbucak 1310, Eux.el.

#### GENTIANACEAE

*Centaurium erythraea* Rafn. subsp. *erythraea*

A6 Ordu: Karapınar district, meadow, 80 m, 06.08. 2003, Özbucak 1269.

#### CONVOLVULACEAE

*Convolvulus arvensis* L.

A6 Ordu: Memişli district, edges of hazelnut grove, 60 m, 08.11. 2003, Özbucak 1406.

*Calystegia silvatica* (Kit.) Griseb.

A6-A7 Ordu: Memişli district, roadside, 60 m, 09.07. 2004, Özbucak 1199-1469.

#### BORAGINACEAE

*Myosotis arvensis* (L.) Hill.

A6 Ordu: İncirli district, meadow, 130 m, 06.04. 2003, Özbucak 1211, Euro.-Sib. el.

*M. laxa* Lehm., subsp. *caespitosa* (C.F.Schultz) Hyl.ex Nordh.

A6 Ordu: Bölükbaşıoğlu district, stream side, 30 m, 06.04. 2003, Özbucak 1206.

*Cynoglossum creticum* Mill.

A6 Ordu: İncirli district, rocky, 130 m, 21.04. 2003, Özbucak 1223.

*C. montanum* L.

A6 Ordu: İncirli district, rocky, 130 m, 21.06. 2003, Özbucak 1222, Euro.-Sib. el.

*Echium vulgare* L.

A7 Ordu: Yeniköy district, meadow, 30 m, 21.04. 2003, Özbucak 1221, Euro.-Sib. el.

#### SOLANACEAE

*Solanum dulcamara* L

A6-A7 Ordu: Karamahmut district- Oskara district, meadow, 60 m-130 m, 21.06. 2003- 31.05. 2004, Özbucak 1239-1483.

#### SCROPHULARIACEAE

*Verbascum blattaria* L.

A6 Ordu: Kurdan district, edges of hazelnut grove, 10 m, 06.08. 2003, Özbucak 1272.

*Scrophularia scopolii* (Hoppe ex) Pers

A6 Ordu: Terzili district, field and roadside, 60 m, 06.08. 2003, Özbucak 1276.

*Veronica persica* Poirlet

A6-A7 Ordu: Karapınar district- Akçatepe district, meadow- roadside, 60 - 90 m, 27.04. 2004- 31.05. 2003, Özbucak 1330-1424.

*V. scardica* Griseb.

A7 Ordu: İncirli district, meadow, 130 m, 31.05. 2004, Özbucak 1449.

#### LABIATAE (LAMIACEAE)

*Teucrium polium* L.

A7 Ordu: Kayabaşı district, edges of hazelnut grove, 60 m, 09.07. 2004, Özbucak 1470.

*Sideritis montana* L. subsp. *montana*

A7 Ordu: Oskara district, field, 130 m, 10.10. 2004, Özbucak 1484, Medit. el.

*Salvia tomentosa* Mill.

A6 Ordu: Terzili district, under *Pinus* sp., 60 m, 06.04. 2003, Özbucak 1207.

*S. viridis* L.

A7 Ordu: Çiftlik district, field, 10 m, 09.07. 2004, Özbucak 1473, Medit. el.

*S. verticillata* L.

A6-A7 Ordu: Kurdan - Kuruhüseyinoğlu districts, roadside, 10 m- 90 m, 21.06. 2003, Özbucak 1248-1425.

*Lamium purpureum* L. var. *purpureum*

A6 Ordu: İncirli district, hazelnut grove and meadow, 130 m, 27.04. 2004, Özbucak 1319, Euro.- Sib.el.

*L. album* L.

A6-A7 Ordu: Kurdan district- Kayabaşı district, hazelnut grove -meadow, 10 m-60 m, 06.04. 2003, Özbucak 1202, Euro.- Sib.el.

*Stachys annua* L. subsp. *annua* var. *annua*



A6-A7 Ordu: İncirli district- Yukartepete village, river bank-stream side, 100 - 130 m, 21.06. 2003, Özbucak 1252-1471.

*Glechoma hederacea* L.

A6 Ordu: Bölükbaşıoğlu district, shrub, 30 m, 27.04. 2004, Özbucak 1314, Euro.-Sib. el.

*Prunella vulgaris* L.

A6 Ordu: Memişli district, stream side, 60 m, 21.06. 2003, Özbucak 1261, Euro.-Sib. el.

*Origanum vulgare* L.

A6 Ordu: Kadioğlu district, rocky, 100 m, 06.04. 2003, Özbucak 1275.

*Satureja hortensis* L.

A6 Ordu: Kurdan district, dune, 10 m, 21.06. 2003, Özbucak 1259.

*Calamintha nepeta* (L.) Savi

A6-A7 Ordu: Karamahmut - Akçatepe districts, meadow-streamside, 60 m, 06.04. 2003, Özbucak 1208-1485.

*Thymus leucostomus* Hausskn & Velen var. *leucostomus*

A6 Ordu: İncirli district, rocky, 130 m, 18.03. 2003, Özbucak 1296, Ir.-Tur.el., Endemic.

*Mentha aquatica* L.

A6 Ordu: Terzili district, field, 60 m, 21.06. 2003, Özbucak 1246.

*M. longifolia* (L.) Hudson

A6 Ordu: Terzili district, field, 60 m, 21.06. 2003, Özbucak 1254.

EUPHORBIACEAE

*Euphorbia stricta* L.

A6 Ordu: Karamahmut district, roadside, 60 m, 27.04. 2004, Özbucak 1302, Euro.-Sib. el.

*E. helioscopia* L.

A6-A7 Ordu: Terzili - Çiftlik districts, stream side- wet places, 10 -60 m, 18.03. 2004- 5.03. 2004, Özbucak 1292-1426.

URTICACEAE

*Urtica dioica* L.

A6-A7 Ordu: Kurdan - Çiftlik districts, wet places, 10 m, 27.04. 2004, Özbucak 1327-1408, Euro.-Sib. el.

CANNABACEAE

*Humulus lupulus* L.

A6 Ordu: Terzili district, shrubby, 60 m, 18.03. 2004, Özbucak 1293, Euro.-Sib. el.

MORACEAE

*Ficus carica* L. subsp. *carica*

A6 Ordu: Kadioğlu district, roadside, 100 m, 21.06. 2003, Özbucak 1264 (cultured).

ULMACEAE

*Ulmus glabra* Hudson

A6 Ordu: Bölükbaşıoğlu district, stream side, 30 m, 27.04. 2004, Özbucak 1312, Euro.-Sib. el.

CORYLACEAE

*Corylus avellana* L. var. *avellana*

A7 Ordu: Karapınar district, stream side, 80m, 27.04. 2004, Özbucak 1321, Euro.-Sib. el.

BETULACEAE

*Alnus glutinosa* (L.) Gaertner

A6 Ordu: İncirli district, wet places, 130 m, 18.03. 2004, Özbucak 1284, Euro.-Sib. el.

*A. glutinosa* (L.) Gaertner subsp. *barbata* (C.A. Meyer) Yalt.

A6 Ordu: Kadioğlu district, stream side, 100 m, 27.04. 2004, Özbucak 1313, Eux. el.

PLATANACEAE

*Platanus orientalis* L.

A6 Ordu: Karamahmut district, stream side, 60 m, 9.07. 2004, Özbucak 1474.

SALICACEAE

*Salix alba* L.

A6-A7 Ordu: İncirli district, river bank, 130 m, 21.04. 2003, Özbucak 1224-1487, Euro.-Sib. el.

*S. babylonica* L.

A6 Ordu: Terzili district, river bank, 60 m, 21.04. 2003, Özbucak 1215.

*Populus alba* L.

A6 Ordu: Karapınar district, stream side, 80 m, 27.04. 2004, Özbucak 1320 .

RUBIACEAE

*Sherardia arvensis* L.

A7 Ordu: Yeniköy, shrubby and roadside, 30 m, 2.05. 2004, Özbucak 1437, Medit. el.

*Asperula orientalis* Boiss. & Hohen.

A6 Ordu: İncirli district, fields, 130 m, 27.04. 2004, Özbucak 1311, Ir.-Tur.el.

*A. arvensis* L.

A7 Ordu: Yeniköy, waste places, 30 m, 7.11. 2004, Özbucak 1497, Medit. el.

*Galium verum* L. var. *verum*

A6 Ordu: Kurdan district, waste places, 10 m, 18.03. 2004, Özbucak 1298, Euro.-Sib. el.

*G. margaceum* Ehrend. & Schön.- Tem

A6 Ordu: Kadioğlu district, rocky places, 100 m, 18.03. 2004, Özbucak 1297, Endemic.

MONOCOTYLEDONEAE

ARACACEAE

*Arum italicum* Mill.

A6 Ordu: Terzili district, shrubby, 60 m, 27.04. 2004, Özbucak 1325.

LILIACEAE

*Smilax excelsa* L.

A7 Ordu: Oskara district, hazelnut grove, 130 m, 31.05. 2004, Özbucak 1440, Eux. el.

*Ruscus colchicus* P.F. Yeo.

A7 Ordu: Akçatepe village, shrub, 60 m, 29.05. 2004,  
Özbucak 1424, Eux. el.

*Ornithogalum sigmoideum* Freyn & Sint

A6 Ordu: Karamahmut district, meadow, 60 m, 18.03.  
2004, Özbucak 1286, Euro.-Sib. el.

#### DIOSCOREACEAE

*Tamus communis* L. subsp. *communis*

A6 Ordu: Karamahmut district, stream side, 60 m, 27.04.  
2004, Özbucak 1324.

#### POACEAE (GRAMINEAE)

*Hordeum murinum* L. subsp. *glaucum* (Steudel) Tzvelev

A7 Ordu: Kayabaşı district, hazelnut grove, 60 m, 10.10.  
2004, Özbucak 1488.

*Holcus lanatus* L.

A6 Ordu: Memişli district, stream side, 60 m, 21.06. 2003,  
Özbucak 1235, Euro.-Sib. el.

*Alopecurus myosuroides* Hudson myosuroides

A6 Ordu: Kurdan district, meadow and roadside, 10 m,  
21.06. 2003, Özbucak 1263.

*Phleum subulatum* (Savi) Aschers. Graebn. subsp.  
*subulatum*

A7 Ordu: Çiftlik district, meadow , 10 m, 26.12. 2003,  
Özbucak 1415.

*Lolium perenne* L.

A7 Ordu: Çiftlik district, hazelnut grove, 10 m, 10.10. 2004,  
Özbucak 1489, Euro.-Sib. el.

*Dactylis glomerata* L. subsp. *hispanica* (Roth) Ny

A7 Ordu: Oskara district, meadow, 10 m, 10.10. 2004,  
Özbucak 1490, Euro.-Sib. el.

*Zea mays* L. subsp. *mays*

A7 Ordu: Yeniköy, cultivated field, 30 m, 09.07. 2004,  
Özbucak, 1476.