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Floristic Features of *Pinus pinea* Forests in Bergama-Kozak Plateau (İzmir)

Abstract

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Pinus pinea L. (Stone pine) forests are not widespread on the World. Spread area of stone pine around the world indicates that it is a taxon localized in the Mediterranean basin. In this study the floristic features of *Pinus pinea* forests in the Aegean region of Turkey have been investigated. 274 taxon belonging to 166 genera and 44 families were identified in the study area. Distribution numbers and rates of the taxon in terms of phytogeographic regions are as follows: Mediterranean elements 92 (33.57%), Euro-Siberian elements 12 (4.37%) and Irano-Turanian 1 (0.0036%). The numbers of endemic taxa are 13 and the rate of endemism is 4.74%. In addition, twenty taxa are new record for B1 square.

Key words: Bergama-Kozak, floristic composition, new square, stone pine.

Introduction

Pinus pinea L. (stone pine) is a species that can be found around the Mediterranean basin. The total area covered by stone pine woodlands is 380.000 he. (75% in Spain, 9% in Turkey, 9% in Portugal, 5% in Italy, and lower percentages in Greece, Lebanon and France). Stone pine seeds are used as nourishment and have both economic and ecologic importance because of that they have been moved to different areas by the people along the history. Hence, where stone pine is natural or introduced has been the subject of debate among plant ecologist. For example, Francini (Mirov 1967) stated that the stone pine communities in Italy were planted by Pope IX. Clement in 1666, and they originated from Crete Island. Yet, Feinbrun (Mirov 1967) claimed that stone pine is natural in Portugal, Spain, Corsica and Turkey, but it was introduced to Crete Island. However, according to paleobotany records, cone and pine needle fossils of *Pinus pseudopinea*, which is accepted as forefather of *Pinus pinea*, was found in Pliocene beds, in Southern France (Mirov 1967). *Pinus pinea* does not have a widespread distribution on earth-surface because of its selectivity of parent rock. Distribution areas of stone pine on earth-surface show that this plant species belongs to the Mediterranean river basin. Stone pine does not have a spread widely in Turkey, but it is found in Bergama-Kozak, Aydın-Koçarlı, Antalya-Side, around

the Marmara sea, the coast of Gemlik gulf, Önsen and Hacıağalı villages in K.Maraş, Artvin and Trabzon in Black Sea region as Mediterranean enclave. The total area of stone pine in Turkey is 30-35 thousand hectares (Figure1). Moreover, due to the economic advantage and utility of stone pine, its plantation hugely increase in Turkey.

In the study, the aim was to assess the floristical structure of *P. pinea* L. forests which are naturally distributed in İzmir (Bergama-Kozak) province.

Description of The Study Area

The study area is in the west-Anatolia region of Turkey. The study area is within the boundary of İzmir province in the Kozak (Yukarıbey) village of Bergama. The research area falls within B1 of the grid system adopted by Davis (1965-1988). The area has a rough topography and its altitude ranges from 220 to 750 m. Kozak region has 16.000 hectare stone pine field. Approximately, ten thousand hectare fields of this sixteen thousand hectare are natural. From stone pine “nut” point of view, Kozak region is the most productive field of Turkey (Fig. 1).

The meteorological climatic data were obtained from the General Directory of Meteorological Affairs (Anonymus 2005). The study area has a Mediterranean climate, the main characteristics of which are: dry summers and warm and rainy winters. The seasonal precipitation regime during the year is as : winter, autumn, spring and summer (Akman 1982). In the research area, the annual mean temperature is 16.3 °C. The maximum mean temperature (M) is 33.3 °C in July. The minimum mean temperature (m) is 3.2 °C in January. For the characterization of the climatic characteristics of the area, Emberger’s pluviothermique quotient and Walter’s ombrothermique diagrams (Walter 1956) were used (Fig. 2).

Material and Methods

The materials of this investigation are comprised plant specimens collected (İzmir province) in the *Pinus pinea* L. forests between 2003 and 2005. The majority of the specimens were identified by using the Flora of Turkey and the East Aegean Islands (Davis 1965-1985, Davis & al. 1988). In cases of uncertainty, Flora Europaea (Tutin & al. 1964-1981) was used as well. The plants are listed in the appendix according to Davis system (1965-1988). The geographical location (the area lies entirely within “B1 İzmir-Bergama-Kozak, which is omitted from the station), collection date, the name of the collector and the collection number were given after the name of every taxon in the list. An asterisk (*) in front of a plant name indicates a new record for the B1 grid square. The abbreviations used in the list are as follows; E. Medit.= East Mediterranean element, Medit.= Mediterranean element, Euro.-Sib.= Euro-Siberian element, Ir.-Tur.= Irano-Turanian element. Author name of every taxon was written according to the Authors of Plant Names (Brummitt & Powell 1992).

The phytogeographical region is cited unless the species has a cosmopolitan and multiregional distribution.

The findings of this study were examined and then compared with the results of other

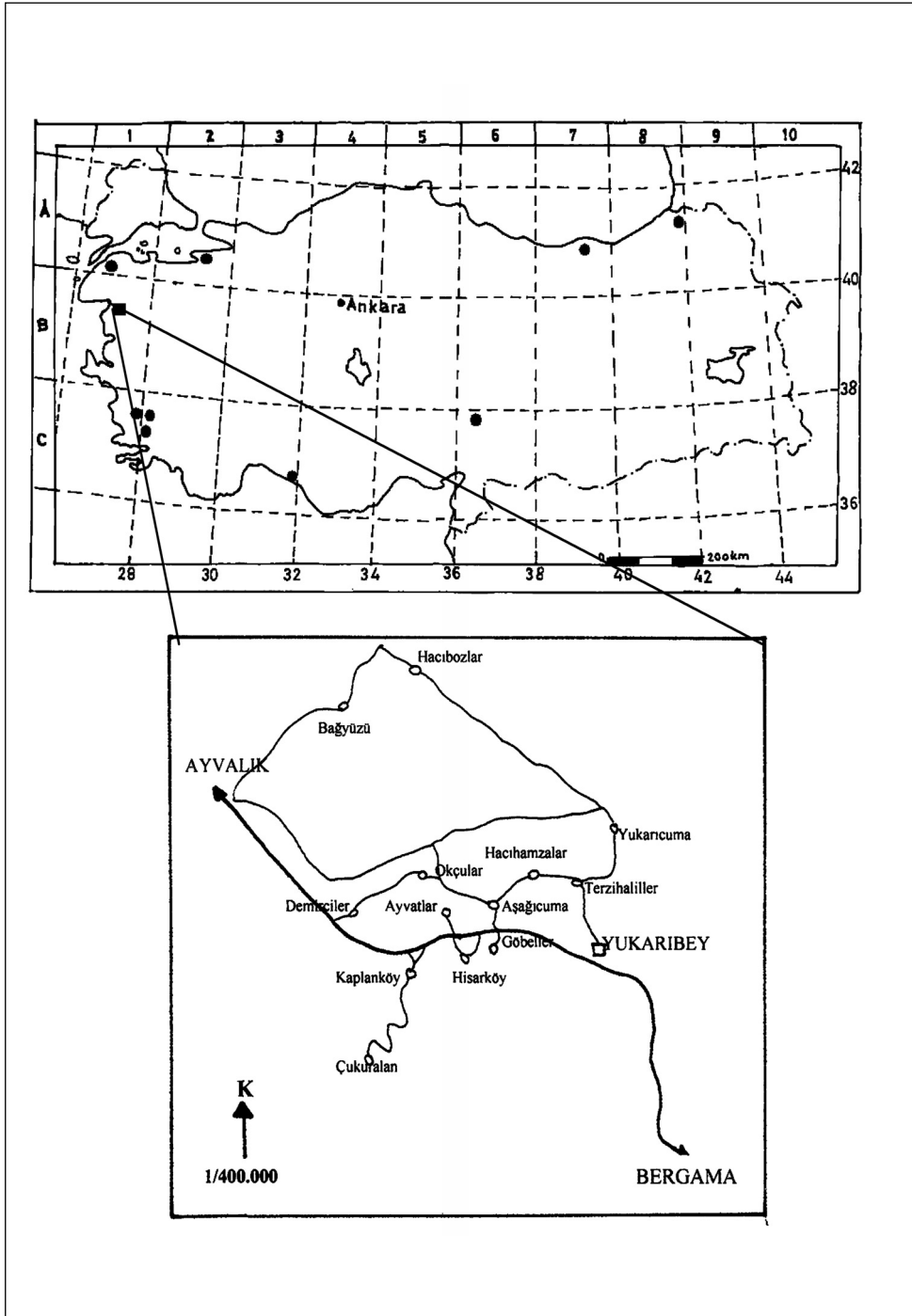


Fig. 1. Distribution of *Pinus pinea* L. in Turkey and Study Area.

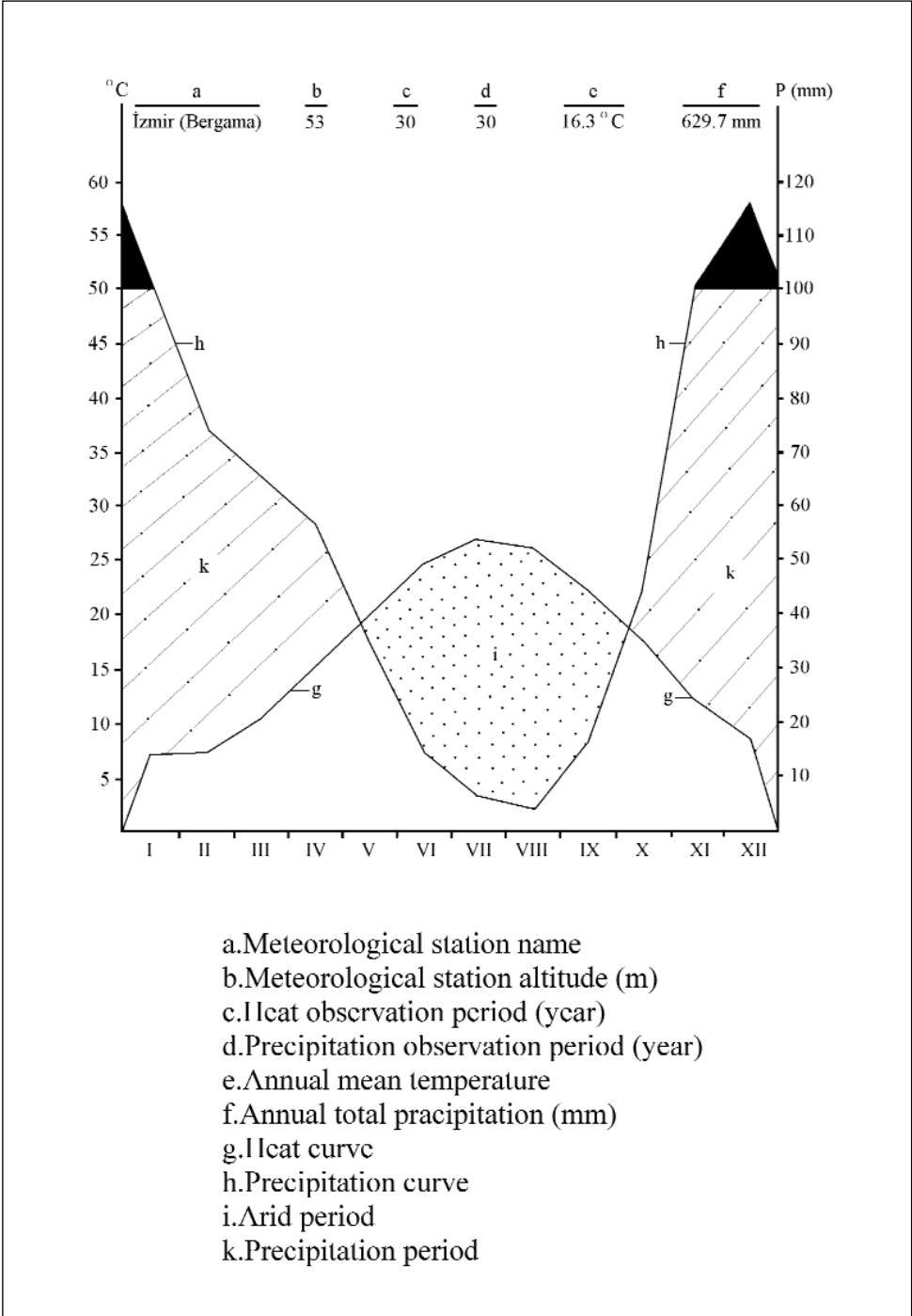


Fig. 2. Climatic diagram of Bergama.

researchs (Karaer & al. 1998; Varol 2003, 2006) carried out in nearer locations, according to phytogeographical region and the large families and genera.

The plant specimens prepared for herbarium collection have been stored in the Department of Biology, Faculty of Science & Art, Muğla University.

Abbreviations

Euro.-Sib. ele. :Euro-Siberian element,

E. Medit. ele. : East Mediterranean element,

End. : Endemic,

Ir.-Tur. ele. : Irano-Turanian element,

Medit. ele. : Mediterranean element.

A brief description of the vegetation

The studied area lies in the west Anatolia. The presence of therophyte plants was abundant in the study area while dominant species was *Pinus pinea* L., shrubs such as *Quercus coccifera*, *Pistacia terebinthus* ssp. *palaestina*, *Crataegus monogyna* var. *amygdaliformis*, *Cistus creticus*, *Quercus pubescens*, *Pyrus amygdaliformis* var. *amygdaliformis* are remarkable. Stone pine forest forms unmixed community in the research area. Stone pine forest occurs on slopes with an inclination of 5-40 % between 200-760 m. elevation in the study area, which occurs in the EU-Mediterranean zone.

Result and Discussion

The floristic data relating to the *P. pinea* forests in the İzmir (Bergama-Kozak) province. This floristic study was carried out with approximately 700 plant specimens collected a period of three years. As a result of the identification of the plant specimens, 44 families, 166 genera, 274 taxon were determined. Fourteen of the collected taxa are endemic. Twenty plant samples which identified were collected first time from B1 square (Donner 1990). Three of the 274 taxa are in Pteridophyta while 271 are in Spermatophyta. Two of the 271 taxa are in Gymnospermae while 269 are in Angiospermae. Of these, 225 taxa belong to the class Dicotyledones, while the other 44 belong to Monocotyledones. The results are summarised in Table 1.

The taxa of the study area, categorized according to phytogeographical regions, can be listed as follows: Mediterranean elements 92 (33.576%), Euro-Sib. elements 12 (4.379%) Irano-Turanian elements 1 (0.00364%) and the remaining 169 (61.678%) taxa are multi-regional. The results of the studies conducted in similar areas, together with the endemic and phytogeographical distribution are presented in Table 2.

Table 1. The floristic evaluation of *Pinus pinea* forests in Bergama-Kozak.

	Pteridophyta	Gymnospermae	Dicotyledones	Monocotyledones	Total
Number of Families	3	1	34	6	44
Number of Genera	3	1	130	32	166
Number of Taxa	3	2	225	44	274

Table 2. Comparison of the numbers and percentages the endemic and phytogeographical elements.

Research Area	Bergama-Kozak		Varol 2006 Kahramanmaraş		Varol 2003 Muğla		Karaer et al.1998 Trabzon and Artvin	
	number	(%)	number	(%)	number	(%)	number	(%)
Medit. ele.	92	33.57	34	26.15	81	38.75	14	8.80
Ir.-Tur. ele.	1	0.0036	16	12.30	6	2.83	9	5.66
Euro.-Sib. ele.	12	4.37	3	4.36	4	1.88	44	27.67
Multi-regional	169	61.67	77	59.23	121	57.07	92	57.86
Endemic taxon	13	4.74	5	3.84	11	5.18	8	5.03

Table 3. Comparison of the numbers and percentages largest families in Bergama-Kozak and other studies.

Research Area	Bergama-Kozak		Varol 2006 Kahramanmaraş		Varol 2003 Muğla		Karaer et al.1998 Trabzon and Artvin	
	number	(%)	number	(%)	number	(%)	number	(%)
Fabaceae	50	18.24	19	14.61	24	11.32	17	10.69
Asteraceae	40	14.59	12	9.23	21	9.90	17	10.69
Poaceae	21	7.66	18	13.84	26	12.26	7	4.40
Brassicaceae	17	6.20	-	-	-	-	-	-
Caryophyllaceae	15	5.47	7	5.38	15	7.07	-	-
Lamiaceae	15	5.47	-	-	12	5.66	15	9.43
Liliaceae	-	-	6	4.61	12	5.66	-	-
Rubiaceae	-	-	6	4.61	-	-	-	-
Rosaceae	-	-	-	-	-	-	7	4.40
Boraginaceae	-	-	-	-	-	-	7	4.40

This study was carried out in the Mediterranean phytogeographic region and the number of Mediterranean elements is naturally higher than that of the elements of other regions. Compared with the results of the research in flora of Muğla (Varol 2003), approximately the same proportion of Mediterranean elements was fixed. However, the proportion of Euro-Siberian elements in the Trabzon-Artvin area is rather higher than in our study area (Karaer & al. 1998). The rate of endemism in our research area and other studies are very low (3.84%-5.18%), when compare with endemism ratio in the total Flora of Turkey (33%). This ratio may not seem to be high. But, when we focus on the flora in Turkey, it

is observed that 85% of the endemic taxa grow between 1000-2000 m. In this case, plains at lower altitudes are poor in terms of endemics.

The largest six families according to number of species in our study and the studies mentioned above are compared in Table 3.

The *Fabaceae*, *Poaceae* and *Asteraceae* families in Bergama-Kozak, Kahramanmaraş and Muğla areas are among the first three families, according to their representative taxa numbers. The *Lamiaceae* family in the Tarabzon-Artvin area is among the first three families.

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**APPENDIX
FLORISTIC LIST**

PTERIDOPHYTA

HYPOLEPIDACEAE

1. *Pteridium aquilinum* (L.) Kuhn

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 01.11.2003, Varol 4582.

ASPLENIACEAE

2. *Asplenium trichomanes* L. subsp. *trichomanes*

Kozak-Ayvalık road, Ayvalık 37-38. km roadside, 440 m, 30.05.2004, Varol 5176.

ATHYRIACEAE

3. *Cystopteris fragilis* (L.) Bernh.

Ayvalık-Bağyüzü village, Çıncık locale, 550-600 m, 02.11.2003, Varol 4616.

**SPERMATOPHYTA
GYMNOSPERMAE**

PINACEAE

4. *Pinus brutia* Ten.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 08.04.2006, Varol 5713.

5. *P. pinea* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 08.04.2006, Varol 5715.

**ANGIOSPERMAE
DICOTYLEDONES**

RANUNCULACEAE

6. *Ranunculus neapolitanus* Ten.

Okçular village road junction, 250 m, 30.05.2004, Varol 5206.

7. *R. reuterianus* Boiss.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4842.

End.

***8. *R. gracilis* Clarke**

Bergama-Kozak road 24. km, Porsukburnu locale, 400-500 m, 19.04.2004, Varol 4875;

Hisarköy-Ayvatlar village road junction, 435 m, 19.04.2004, Varol 4921.

9. *R. isthmicus* subsp. *tenuifolius* (Stev.) Davis

Okçular village road junction, 250 m, 19.04.2004, Varol 4934.

End., E. Medit. element

10. *R. marginatus* d'Urv. var. *marginatus*

Bergama-Kozak road 24. km, Porsukburnu locale, 400-500 m, 29.05.2004, Varol 5056.

11. *R. marginatus* var. *trachycarpus* (Fisch. & Mey.) Azn.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 4994b.

12. *R. chius* DC.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 4994a.

13. *R. ficaria* subsp. *ficariiformis* Rouy & Fouc.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 06.03.2004, Varol 4647.

PAPAVERACEAE**14. *Papaver gracile* Aucher**

Ayvalık-Bağyüzü village entrance, 550-600 m, 30.05.2004, Varol 5335.

E. Medit. element

15. *P. rhoeas* L.

Şarlok to Gobeller village 5. km, 510 m, 29.05.2004, Varol 5105.

16. *Hypocoum imberbe* Sibth. & Sm.

Hisarköy-Ayvatlar road junction, 435 m, 07.03.2004, Varol 4658

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4831.

17. *Fumaria kralikii* Jordan

Hisarköy-Ayvatlar road junction, 435 m, 19.04.2004, Varol 4922;

Ayvalık-Bağyüzü village entrance, 550-600 m, 19.04.2004, Varol 4954.

Medit. element

BRASSICACEAE (CRUCIFERAE)**18. *Hirschfeldia incana* (L.) Lag.-Foss.**

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5029;

Ayvalık-Bağyüzü village, Burhaniye road 2. km, 30.05.2004, Varol 5265;

19. *Raphanus raphanistrum* L.

Hisarköy-Ayvatlar road junction, 435 m, 19.04.2004 Varol 4918;

Göbeller village-Ayvalık road 1. km, 450-500 m, 19.04.2004, Varol 4953;

Okçular village road junction, 250 m, 30.05.2004, Varol 5222;

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 12.06.2004, Varol 5448.

20. *Isatis tinctoria* subsp. *tomentella* (Boiss.) Davis

31. km to Ayvalık, roadside, 450 m, 30.05.2004, Varol 5194;

Ayvalık-Bağyüzü village upperside, 520 m, 13.06.2004, Varol 5554.

21. *Thlaspi perfoliatum* L.

Bergama-Kozak road 24. km, Porsukburnu locale, 400-500 m, 19.04.2004, Varol 4873.

22. *Teesdalia coronopifolia* (Berg.) Thellung

Ayvalık-Bağyüzü village entrance, 480 m, 21.03.2005, Varol 5657.

Medit. element

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

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4844.

24. *Bunias erucago* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4835.

25. *Alyssum desertorum* Stapf var. *desertorum*

Ayvalık-Bağyüzü village entrance, 480 m, 13.06.2004, Varol 5543.

26. *A. foliosum* var. *megalocarpum* Hal.

Şarlok-Gobeller road 7-8. km, 19.05.2004, Varol 5130.

E. Medit. element

27. *A. minutum* Schlecht. ex DC.

Ayvalık-Bağyüzü village entrance, 480 m, 21.03.2005, Varol 5655.

28. *A. fulvescens* var. *stellatocarpum* Hub.-Mor.

Ayvalık-Bağyüzü village entrance, 550-600 m, 30.05.204, Varol 5336.

End., E. Medit. element

29. *A. umbellatum* Desv.

Şarlok locale, 480-500 m, 19.04.2004, Varol 4898.

E. Medit. element

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

Hisarköy-Ayvatlar road junction, 435 m, 07.03.2004, Varol 4662;

31. *Cardamine hirsuta* L.

Bergama-Kozak road 24. km, Porsukburnu locale, 400-500 m, 06.03.2004, Varol 4650;

Şarlok locale, 480-500 m, 19.04.2004, Varol 4836.

32. *Sisymbrium officinale* (L.) Scop.

Şarlok road junction 3-4. km, 540 m, 12.06.2004, Varol 5481.

33. *S. altissimum* L.

Ayvalık 39 km roadside, 385 m, 29.05.2004, Varol 5152;

Ayvalık-Bağyüzü village-Burhaniye road 2. km, 550-600 m, 30.05.2004, Varol 5266.

34. *Arabidopsis thaliana (L.) Heynh.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4848.

CISTACEAE

35. *Cistus creticus* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5028;

Ayvalık-Bağyüzü village-Burhaniye road 2. km, 550-600 m, 30.05.2004, Varol 5254.

Omni-Medit. element

36. *C. laurifolius* L.

Şarlok to Gobeller village 4. km, 580 m, 13.06.2004, Varol 5551.

37. *Tuberaria guttata* (L.) Fourr. *guttata*

Şarlok to Gobeller village 6. km, 510 m, 29.05.2004, Varol 5120.

Medit. element

VIOLACEAE

38. *Viola parvula* Tineo

Hisarköy-Ayvatlar road junction, 435 m, 07.03.2004, Varol 4660.

39. *V. kitaibeliana* Roem.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4850.

CARYOPHYLLACEAE

40. *Arenaria leptoclados (Reichb.) Guss.

Şarlok to Gobeller village 3. km, 490 m, 12.06.2004, Varol 5474b.

41. *Minuartia hybrida* (Vill.) Schischk. subsp. *hybrida*

Şarlok to Gobeller village 6. km Varol 5474b

42. *Cerastium glomeratum* Thuill.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4825;

Ayvalık-Bağyüzü village entrance, 500-600 m, 19.04.2004, Varol 4961.

43. *C. brachypetalum* subsp. *roeseri* (Boiss. & Heldr.) Nyman

Kozak-Ayvalık road, Ayvalık 37-38. km roadside, 440 m, 30.05.2004, Varol 5158;

Ayvalık-Bağyüzü village-Burhaniye road 2. km, 550-600 m, 30.05.2004, Varol 5317.

44. *C. illyricum* subsp. *comatum* (Desv.) Sell & Whitehead

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 12.06.2004, Varol 5433.

Medit. element

45. *Holosteum umbellatum L. var. *umbellatum*

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004 Varol 4858.

46. *Moenchia mantica* (L.) Bartl. subsp. *mantica*

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4852;
Ayvalık-Bağyüzü village-Burhaniye road 2. km, 550-600 m, 30.05.2004, Varol 5283.

47. *Polycarpon tetraphyllum* (L.) L.

Şarlok to Gobeller village 3. km, 510 m, 29.05.2004, Varol 5091.

48. *Petrorhagia velutina* (Guss.) Ball & Heywood

Okçular village 3 km roadside, 315 m, 19.04.2004, Varol 4946;
Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4975.

49. *Velezia rigida* L. [II:137]

Ayvalık-Bağyüzü village entrance, 550-600 m, 30.05.2004, Varol 5328.

50. *Silene italica* (L.) Pers.

Bergama-Kozak road 20-22. km, Soğanlı locale, 480 m, 12.06.2004, Varol 5445
Bağyüzü village-Burhaniye road 2. km, 550-600 m, 30.05.2004, Varol 5258.

51. *S. behen* L.

Ayvalık-Bağyüzü village-Burhaniye road 2. km, 550-600 m, 30.05.2004, Varol 5286.

52. *S. gallica* L.

Ayvalık-Bağyüzü village-Burhaniye road 2. km, 550-600 m, 30.05.2004, Varol 5300;
Okçular village 3 km roadside, 310 m, 30.05.2004, Varol 5244.

53. *S. subconica* Friv.

Kozak-Ayvalık road, Ayvalık 40 km roadside, 485 m, 29.05.2004, Varol 5139.

54. *S. lydia* Boiss.

Şarlok locale, 480 m, 19.04.2004, Varol 4903;
Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4982.
E. Medit. element

ILLECEBRACEAE**55. *Herniaria hirsuta* L.**

Şarlok to Gobeller village 4. km, 580 m, 13.06.2004, Varol 5490.

POLYGONACEAE***56. *Polygonum arenastrum* Bor.**

Ayvalık 39. km, roadside, 460 m, 02.11.3003, Varol 4601.

57. *Rumex scutatus* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5039;
Okçular village road junction, 250 m, 30.05.2004, Varol 5218.

58. *R. pulcher* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5021.

59. *R. bucephalophorus* L.

Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4969;
2 km to Okçular village, 380 m, 13.06.2004, Varol 5536.
Medit. element

GUTTIFERAE**60. *Hypericum atomarium* Boiss.**

Şarlok road junction-Gobeller village 5. km, 570 m, 13.06.2004, Varol 5498.
E. Medit. element

MALVACEAE**61. *Malva sylvestris* L.**

Şarlok road junction-Gobeller village 5. km, 510 m, 29.05.2004, Varol 5107.

GERANIACEAE

62. *Geranium lucidum* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4839.

63. *G. purpureum* Vill.

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5273;
Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 470 m, 13.06.2004, Varol 5518.

64. *G. molle* L. subsp. *molle*

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4829;
Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4959.

65. *Erodium botrys* (Cav.) Bertol.

Okçular village road junction, 250-300m, 19.04.2004, Varol 4938.

Medit. element

66. *E. cicutarium* (L.) L'Herit. subsp. *cicutarium*

Okçular village road junction, 3 km to Okçulara, 315m, 19.04.2004, Varol 4942.

ANACARDIACEAE

67. *Pistacia terebinthus* L. subsp. *terebinthus* [II:548]

Ayvalık-Bağyüzü village, Çımarcık locale, 550-600 m, 02.11.2003, Varol 4612.

Medit. element

FABACEAE (LEGUMINOSAE)

68. *Chamaecytisus hirsutus* (L.) Link

Hisarköy-Ayvatlar road junction, 435 m, 19.04.2004,
Varol 4913.

69. *Genista lydia* Boiss. var. *lydia*

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5182;
Şarlok road junction-Gobeller village 3. km
510 m, 12.06.2004, Varol 5476.

70. *G. anatolica* Boiss.

Ayvalık-Bağyüzü village, Burhaniye road 3 km., 620 m, 13.06.2004, Varol 5550.
Medit. element

71. *Spartium junceum* L.

Kozak-Ayvalık road, 39 km to Ayvalık, roadside, 385 m, Varol 5148.

Medit. element

72. *Adenocarpus complicatus* (L.) Gay

Kozak-Ayvalık road, 39 km to Ayvalık, roadside, 385 m, 29.05.2004, Varol 5145.

73. *Lupinus angustifolius* L. subsp. *angustifolius*

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 380 m, 19.04.2004, Varol 4927.

74. *Biserrula pelecinus* L.

Şarlok locale, 480-500 m, 19.04.2004, Varol 4907.

Medit. element

75. *Vicia cracca* L. subsp. *stenophylla* Vel.

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 385 m, 29.05.2004, Varol 5147.

76. *V. villosa* subsp. *eriocarpa* (Hauusskn.) P.W. Ball

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5174.

77. *V. articulata* Hornem.

Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4977;

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 4999.

- 78. *V. hirsuta*** (L.) S.F. Gray
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4865.
- 79. *V. melanops*** Sibth. & Sm.
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4867;
Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4981.
- 80. *V. grandiflora*** Scop. subsp. *grandiflora*
Hisarköy-Ayvatlar road junction, 435 m, 19.04.2004, Varol 4923.
E. Medit. element
- 81. *V. cuspidata*** Boiss.
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5024.
E. Medit. element
- 82. *V. lathyroides*** L.
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4854;
- 83. *V. sativa*** subsp. *nigra* (L.) Ehrh. var. *segetalis*
Kozak-Ayvalık road, 31 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5200;
- 84. *Lens orientalis*** (Boiss.) Hand.-Mazz.
Bergama-Kozak road 24. km, Porsukburnulocale, 450 m, 29.05.2004, Varol 5062;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5308.
- 85. *Lathyrus digitatus*** (Bieb.) Fiori
Bergama-Kozak road 24. km, Porsukburnulocale, 450 m, 19.04.2004, Varol 4881.
E. Medit. element
- 86. *L. laxiflorus*** (Desf.) Kuntze subsp. *laxiflorus*
Bergama-Kozak road 24. km, Porsukburnulocale, 450 m, 19.04.2004, Varol 4880.
- 87. *L. undulatus*** Boiss.
Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5180.
End., Euxine element
- *88. *L. sphaericus*** Retz.
Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 470 m, 13.06.2004, Varol 5516a.
- 89. *L. setifolius*** L.
Şarlok road junction-Gobeller village 7-8. km, 440 m, 29.05.2004, Varol 5125.
Medit. element
- 90. *L. sativus*** L.
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4838;
Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4963.
- 91. *L. aphaca*** var. *pseudoaphaca* (Boiss.) Davis
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4860;
Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4960.
E. Medit. element
- 92. *Trifolium uniflorum*** L.
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4851.
Medit element
- 93. *T. repens*** L. var. *repens*
Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 02.11.2003, Varol 4600;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5260.
- 94. *T. speciosum*** Willd.
Şarlok road junction-Gobeller village 3. km, 510 m, 29.05.2004, Varol 5066;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5318.
- 95. *T. campestre*** Schreb.
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5008;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5269;

96. *T. glomeratum* L.

Şarlok road junction-Gobeller village 3. km, 510 m, 29.05.2004, Varol 5088;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5284.

97. *T. spumosum* L.

Okçular village road junction, 6 km to Okçular village, 250 m, 30.05.2004, Varol 5112.
Medit. element

98. *T. tomentosum* L.

Okçular village road junction, 2 km to Okçular, 400 m, 30.05.2004, Varol 5243.

99. *T. glanduliferum* Boiss. var. *glanduliferum*

Şarlok locale, 480-500 m, 19.04.2004, Varol 4899.

E. Medit. element

100. *T. stellatum* L. var. *stellatum*

Kozak-Ayvalık road, 30 km to Ayvalık, roadside, 380 m, 19.04. 2004, Varol 4926;
Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4955.

101. *T. striatum* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5019.

102. *T. phleoides* Pourr. ex Willd.

Şarlok to Gobeller village 3,5. km, 510 m, 12.06.2004, Varol 5475.

Medit element

103. *T. cherleri* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5036.

Medit. element

104. *T. arvense* L. var. *arvense* [III:432]

Ayvalık-Bağyüzü village, Çımarık locale, 550-600 m, 02.11.2003, Varol 4606;

Şarlok to Gobeller village 3. km, 510 m, 29.05.2004, Varol 5084.

105. *T. leucanthum* Bieb.

Okçular village road junction, 2 km to Okçular, 400 m, 30.05.2004, Varol 5245;

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5295;

106. *T. pauciflorum* d'Urv.

Okçular village road junction, 3 km to Okçular village, 315 m, 19.04.2004, Varol 4948;

B1 Balıkesir; Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4962.

107. *T. pilulare* Boiss.

Şarlok to Gobeller village 6. km, 510 m, 29.05.2004, Varol 5116.

108. *T. subterraneum* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5048.

***109. *Melilotus elegans* Salzm.**

Okçular village road junction, 6 km to Okçular village, 250 m, 30.05.2004, Varol 5216.

Medit. element

110. *Trigonella smyrnea* Boiss.

Okçular village road junction, 6 km to Okçular village, 250 m, 30.05.2004, Varol 5208.

End., E. Medit. element

111. *Medicago polymorpha* var. *vulgaris* (Benth.) Shinnars

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5022.

112. *M. littoralis* Rohde ex Lois. var. *littoralis*

Bergama-Kozak road 24 km, Porsukburnu locale, 450 m, 19.04.2004, Varol 4885 B1 Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5309.

113. *Lotus angustissimus* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 12.06.2004, Varol 5430.

114. *Hymenocarpus circinnatus* (L.) Savi

Okçular village road junction, 5 km to Okçular village, 250 m, 19.04.2004, Varol 4940;
Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4985.

Medit. element

115. *Ornithopus compressus* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4856;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5285.

Medit. element

116. *Onobrychis caput-galli* (L.) Lam.

Okçular village road junction, 6 km to Okçular village, 250 m, 30.05.2004, Varol 5232;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5321.

Medit. element

117. *O. oxyodonta* Boiss.

Şarlok to Gobeller village 7. km, 500 m, 13.06.2004, Varol 5505.

ROSACEAE**118. *Rubus sanctus* Schreb. [IV:33]**

Bergama-Kozak road 24. km, Porsukburnu, 480 m, 02.11.2003, Varol 4587.

119. *Sanguisorba minor* subsp. *muricata* (Spach) Briq.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5012;

120. *Rosa canina* L.

Bergama-Kozak road 24. km, Porsukburnu, 480 m, 02.11.2003, Varol 4586;
Ayvalık-Bağyüzü village, Çımarcık locale., 550-600 m, 02.11.2003, Varol 4615.

121. *Crataegus monogyna* Jacq. subsp. *monogyna*

Kozak-Ayvalık road, 39 km to Ayvalık, roadside, 460 m, 02.11.2003, Varol 4592;
Ayvalık-Bağyüzü village, Çımarcık locale., 550-600 m, 02.11.2003, Varol 4613

122. *Pyrus amygdaliformis* Vill. var. *amygdaliformis*

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 12.06.2004, Varol 5414.

CRASSULACEAE**123. *Umbilicus rupestris* (Salisb.) Dandy**

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5164.

SAXIFRAGACEAE**124. *Saxifraga cymbalaria* L. var. *cymbalaria***

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5161.

APIACEAE (UMBELLIFERAE)**125. *Lagoecia cuminoides* L.**

Okçular village road junction, 6 km to Okçular village, 250 m, 30.05.2004, Varol 5212.
Medit. element

126. *Scandix pecten-veneris* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4830;
Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4958.

127. *S. australis* subsp. *grandiflora* (L.) Thell.

Okçular village road junction, 5 km to Okçular village, 315 m, 19.04.2004, Varol 4932.

128. *Oenanthe pimpinelloides* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5049.

129. *Tordylium apulum* L.

Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4984;
Okçular village road junction, 6 km to Okçular village, 250 m, 30.05.2004, Varol 5215.

130. *Torilis arvensis* subsp. *purpurea* (Ten.) Hayek

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5002;
Ayvalık-Bağyüzü village entrance, 550-600 m, 30.05.2004, Varol 5337.

Medit. element

131. *T. ucranica* Spreng.

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5301;
Okçular village road junction, 3 km to Okçular, 220 m, 13.06.2004, Varol 5528.

132. *Orlaya daucooides* (L.) Greuter

Bergama-Kozak road 24. km, Porsukburnu, 480 m, 19.04.2004, Varol 4882;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5276;
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 12.06.2004, Varol 5456.

Medit. element?

133. *Daucus carota* L.

Okçular village road junction, 6 km to Okçular village, 18.08.2003, Varol 4569;
Ayvalık-Bağyüzü village, Çınarcık locale., 550-600 m, 02.11.2003, 4610.

134. *D. guttatus* Sm.

Okçular village road junction, 5 km to Okçular village, 470 m, 13.06.2004, Varol 5527.

VALERIANACEAE

135. *Valerianella costata* (Stev.) Betsche

Okçular village road junction, 3,5 km to Okçular village, 310 m, 30.05.2004, Varol 5239.
Medit. element

136. *V. carinata* Lois.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4849.

137. *V. discoidea* (L.) Lois.

Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4966.
Medit. element

DIPSACACEAE

138. *Knautia integrifolia* var. *bidens* (Sm.) Borbas

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5168;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, 5253.
E. Medit. element

ASTERACEAE (COMPOSITAE)

***139. *Xanthium spinosum* L.**

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 01.11.2003, Varol 4580.

140. *Logfia arvensis* (L.) Holub

Okçular village road junction, 6 km to Okçular village, 220 m, 18.08.2003, Varol 4575;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5262;

141. *Conyza canadensis* (L.) Cronquist

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 460 m, 02.11.2003, Varol 4598.

142. *Bellis perennis* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4841.
Av.-Sib. element

143. *Doronicum orientale* Hoffm.

Bergama-Kozak road 24. km, Porsukburnu, 480 m, 19.04.2004, Varol 4879.

144. *Senecio vulgaris* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2005, Varol 4827.

145. *S. vernalis* Waldst. & Kit.

Okçular village road junction, 4 km to Okçular village, 250 m, 07.03.2004, Varol 4655;
Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4972.

***146. *Anthemis tinctoria* var. *pallida* D.C.**

Bergama-Kozak road 24. km, Porsukburnu, 480 m, 29.05.2004, Varol 5059;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5257;

147. *Tripleurospermum parviflorum* (Willd.) Pobed.

Hisarköy-Ayvatlar road junction, 435 m, 07.03.2004, Varol 4661.

148. *Picnomon acarna* (L.) Cass.

Şarlok to Gobeller village 4. km, 580 m, 13.06.2004, Varol 5492.

Medit. element

149. *Carduus nutans* L. subsp. *nutans*

Şarlok to Gobeller village 8. km, 570 m, 13.06.2004, Varol 5553.

150. *C. pycnocephalus* subsp. *albidus* (Bieb.) Kazmi

Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4974;
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5015.

151. *Jurinea mollis* (L.) Reichb.

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5156.

E. Medit. element

152. *Centaurea cyanus* L.

Şarlok locale, 480 m, 19.04.2004, Varol 4897;
Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4971;
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5033.

153. *Cnicus benedictus* L. var. *benedictus*

Okçular village road junction, 6 km to Okçular village, 250 M, 30.05.2004, Varol 5223;
Ayvalık-Bağyüzü village, 500-600 M, 30.05.2004, Varol 5332.

***154. *Carlina corymbosa* L.**

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 12.06.2004, Varol 5429.

Medit. element

155. *Xeranthemum annuum* L.

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 620 m, 13.06.2004, Varol 5549.

156. *Tragopogon longirostris* Bisch. ex Schultz Bip. var. *longirostris*

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 485 m, 29.05.2004, Varol 5138;

157. *Hypochoeris radicata* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 01.11.2003, Varol 4579;

158. *H. glabra* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 4993.

159. *H. achyrophorus* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 12.06.2004, Varol 5428.

Medit. element

160. *Leontodon tuberosus* L.

Bergama-Kozak road 24. km, Porsukburnu, 480 m, 02.11.2003, Varol 4588;
Ayvalık-Bağyüzü village, 550-600 m, 02.11.2003, Varol 4618;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5291.

Medit. element

161. *Urospermum picroides* (L.) F.W. Schmidt

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5322.

Medit. element

162. *Rhagadiolus stellatus* (L.) Gaertn. var. *stellatus*

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, Varol 5046.

Medit. element

163. *Pilosella hoppeana* subsp. *troica* (Zahn) Sell & West

Şarlok to Gobeller village 8. km, 450 m, 13.06.2004, Varol 5506.

164. *P. piloselloides* subsp. *megalomastix* (NP.) Sell & West

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5003.

165. *Andryala integrifolia* L.

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5175;

Ayvalık-Bağyüzü village, 500-600 m, 30.05.2004, Varol 5334.

Medit. element

166. *Steptorhamphus tuberosus* (Jacq.) Grossh.

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5249.

167. *Lapsana communis* subsp. *intermedia* (Bieb.) Hayek

Kozak-Ayvalık road, 39 km to Ayvalık, roadside, 385 m, 29.05.2004, Varol 5151.

168. *L. communis* subsp. *pisidica* (Boiss. & Heldr.) Rech. fil.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5026.

169. *Taraxacum bessarabicum* (Hornem.) Hand.-Mazz. subsp. *bessarabicum

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 06.03.2004, Varol 4648.

170. *T. aleppicum* Boiss. & Hausskn.

Bergama-Kozak road 24. km, Porsukburnu, 480 m, 02.11.2003, Varol 4589;

Ayvalık-Bağyüzü village, Çıncık locale, 550-600 m, 02.11.2003, Varol 4614;

E. Medit. element

171. *Chondrilla juncea* L. var. *juncea

Okçular village road junction, 6 km to Okçular village, 250 m, 18.08.2003, Varol 4571..

172. *Crepis foetida* subsp. *rhoeadifolia* (Bieb.) Celak.

Ayvalık-Bağyüzü village, Çıncık locale., 550-600 m, 02.11.2003, Varol 4608;

Okçular village road junction, 6 km to Okçular village, 250 m, 30.05.2004, Varol 5227.

173. *C. foetida* L. subsp. *commutata* (Spreng.) Babc.

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 385 m, 29.05.2004, Varol 5150.

174. *C. sancta* (L.) Babc.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4833;

Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4968.

***175. *C. dioscoridis* L.**

Kozak-Ayvalık road, 35 km to Ayvalık, roadside, 380 m, 02.11.2003, Varol 4605;

Ayvalık-Bağyüzü village, Çıncık locale., 550-600 m, 02.11.2003, 4619.

E. Medit. element

176. *C. micrantha* Czer.

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5288;

177. *C. vesicaria* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 4995.

Medit. element

178. *C. setosa* Hall. fil.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5038.

Av.-Sib. element

CAMPANULACEAE**179. *Campanula lyrata* Lam. subsp. *lyrata***

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5027;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5256.
End.

180. *Legousia speculum-veneris* (L.) Chaix

Şarlok to Gobeller village 3. km, 510 m, 29.05.2004, Varol 5080.
Medit. element

181. *L. pentagonia* (L.) Thell.

Bergama-Kozak road 24. km, Porsukburnu, 480 m, 29.05.2004, Varol 5063.

PRIMULACEAE**182. *Cyclamen hederifolium* Aiton**

Şarlok to Gobeller village 3. km, 420-450 m, 06.11.2005, Varol 5644.

183. *Lysimachia linum-stellatum* L.

Kozak-Ayvalık road, 31 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5201.

Medit. element

184. *Anagallis arvensis* L. var. *arvensis*

Okçular village road junction, 6 km to Okçular village, 250 m, 30.05.2004, Varol 5214.

OLEACEAE**185. *Jasminum fruticans* L.**

Şarlok locale, 480-500 m, 19.04.2004, Varol 4896.

Medit. element

BORAGINACEAE***186. *Myosotis cadmaea* Boiss.**

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4862;
Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4956.

E. Medit. element

187. *M. ramosissima* Rochel ex Schult. subsp. *ramosissima*

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4847.

***188. *Anchusa officinalis* L. Groub b**

Şarlok to Gobeller village 5. km, 510 m, 29.05.2004, Varol 5106.

189. *A. undulata* subsp. *hybrida* (Ten.) Coutinho

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4832;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5281.

190. *Alkanna tinctoria* (L.) Tausch subsp. *tinctoria*

Okçular village road junction, 3 km to Okçular, 315 m, 19.04.2004, Varol 4943;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5252.
Medit. element

SCROPHULARIACEAE**191. *Verbascum scamandri* Murb.**

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5185.

End., E. Medit. element

192. *V. napifolium* Boiss.

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 385 m, 29.05.2004, Varol 5155;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5247.

End., E. Medit. element

193. *Linaria chalepensis* (L.) Mill. var. *chalepensis*

Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4976.

E. Medit. element

194. *L. pelisseriana* (L.) Mill.

Şarlok to Gobeller village 3. km, 510 m, 29.05.2004, Varol 5078;

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5267.

Medit. element

195. *Veronica acinifolia* L.

Hisarköy-Ayvatlar road junction, 435 m, 07.03.2004,

Varol 4659.

196. *V. arvensis* L.

Kozak-Ayvalık road, 40 km to Ayvalık, roadside, 485 m, 9.05.2004, Varol 5133.

Av.-Sib. element

197. *Parentucellia latifolia* (L.) Caruel subsp. *latifolia* [VI:767]

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4866.

Medit. element

OROBANCHACEAE

***198. *Orobanche nana* Noë ex G. Beck**

Şarlok to Gobeller village 3. km, 510 m, 29.05.2004, Varol 5103.

199. *O. cernua* L. in Loeffl.

Şarlok to Gobeller village 3. km, 510 m, 29.05.2004, Varol 5081.

VERBENACEAE

200. *Vitex agnus-castus* L.

Okçular village road junction, 6 km to Okçular village, 220 m, 18.08.2003, Varol 4572.

Medit. element

LAMIACEAE (LABIATAE)

201. *Ajuga orientalis* L.

Hisarköy-Ayvatlar road junction, 435 m, 19.04.2004, Varol 4924.

***202. *Lamium garganicum* subsp. *reniforme* (Montbret & Aucher ex Benth.) R. Mill B1 Kozak-**

Ayvalık road, 39 km to Ayvalık, roadside, 385 m, 29.05.2004, Varol 5146.

203. *L. amplexicaule* L. [VII:138]

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4853.

Av.-Sib. element

204. *L. moschatum* Mill. var. *moschatum*

Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4965.

E. Medit. element

205. *Sideritis lanata* L.

Şarlok to Gobeller village 5. km, 315 m, 19.04.2004, Varol 4933;

Ayvalık-Bağyüzü village entrance, 550-600 m, 30.05.2004, Varol 5329.

E. Medit. element

206. *Stachys cretica* subsp. *lesbiaca* Rech. fil.

Kozak-Ayvalık road, 31 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5187;

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5271.

End., E. Medit. element

207. *Prunella lacinata* (L.) L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5006.
Av.-Sib. element

208. *Origanum vulgare* subsp. *hirtum* (Link) Letswaart

Okçular village road junction, 6 km to Okçular village, 220 m, 18.08.2003, Varol 4573;
Ayvalık-Bağyüzü village, Çımarcık locale., 550-600 m, 02.11.2003, 4611;
E. Medit. element

209. *Calamintha nepeta* subsp. *glandulosa* (Req.) P.W. Ball

Okçular village road junction, 6 km to Okçular village, 220 m, 04.11.2003, Varol 4631.

210. *Clinopodium vulgare* L. subsp. *vulgare*

Kozak-Ayvalık road, 39 km to Ayvalık, roadside, 460 m, 13.06.2004, Varol 5507;

211. *Acinos rotundifolius* Pers.

Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4970;
Bergama-Kozak road 24. km, Porsukburnu, 450 m, 29.05.2004, Varol 5060.

212. *Thymus longicaulis* subsp. *chaubardii* (Boiss. & Heldr. ex Reichb. fil.) Jalas var. *chaubardii*

Ayvalık-Bağyüzü village, Burhaniye road 3 km., 550-600 m, 13.06.2004, Varol 5548.

213. *Mentha pulegium* L.

Okçular village road junction, 6 km to Okçular village, 220 m, 18.08.2003, Varol 4568.

214. *Ziziphora taurica* subsp. *cleonioides* (Boiss.) Davis

Ayvalık-Bağyüzü village entrance, 550-600 m, 30.05.2004, Varol 5327.

End., E. Medit. element

215. *Salvia tomentosa* Mill.

Kozak-Ayvalık road, 39 km to Ayvalık, roadside, 385 m, 29.05.2004, Varol 5154;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5248.
Medit. element

PLANTAGINACEAE**216. *Plantago lanceolata* L.**

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5032;

217. *P. bellardii* All.

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5181;
Ayvalık-Bağyüzü village entrance, 480 m, 13.06.2004, Varol 5542.

E. Medit. element

RAFFLESACEAE**218. *Cytinus hypocistis* subsp. *kermesinus* (Guss.) Wettst.**

Şarlok to Gobeller village 3. km, 510 m, 29.05.2004, Varol 5097.

Medit. element

EUPHORBIACEAE**219. *Euphorbia taurinensis* All.**

Okçular village road junction, 2 km to Okçular, 315 m, 07.03.2004, Varol 4656;

Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4964;

FAGACEAE**220. *Quercus pubescens* Willd.**

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 12.06.2004, Varol 5424.

221. *Q. cerris* L. var. *cerris*

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 380 m, 02.11.2003, Varol 4604; Ayvalık-Bağyüzü village, 500-600 m, 02.11.2003, varol 4609).

222. *Q. coccifera* L.

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 380 m, 02.11.2003, Varol 4603; Medit. element

RUBIACEAE

223. *Sherardia arvensis* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2004, Varol 4868; Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4978. Medit. element?

224. *Crucianella angustifolia* L.

Okçular village road junction, 3 km to Okçular, 310 m, 30.05.2004, Varol 5240; Ayvalık-Bağyüzü village, 480 m, 13.06.2004, Varol 5540; Medit. element

225. *Galium odoratum* (L.) Scop.

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5166. Av.-Sib. element

226. *G. spurium* L. subsp. *spurium*

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 19.04.2004, Varol 4950; Bergama, Kozak-Ayvalık road, 39 km to Ayvalık, roadside, 385 m, 29.05.2004, Varol 5153. Av.-Sib. element

227. *G. penduliflorum* Boiss.

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5178. End., E. Medit. element

228. *G. brevifolium* Sm. subsp. *brevifolium*

Şarlok locale, 480 m, 19.04.2004, Varol 4892; Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4980. End., E. Medit. element

229. *G. murale* (L.) All.

Kozak-Ayvalık road, 31 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5202; Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 12.06.2004, Varol 5453. Medit. element

230. *Cruciata pedemontana* (Bellardi) Ehrend.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 12.06.2004, Varol 5452. E. Medit. element

MONOCOTYLEDONES

LILIACEAE

231. *Ruscus aculeatus* L. var. *aculeatus

Kozak-Ayvalık road, 40 km to Ayvalık, roadside, 440 m, 02.11.2003, Varol 4602.

***232. *Asparagus acutifolius* L.**

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 01.11.2003, Varol 4583;

233. *Asphodelus aestivus* Brot.

Okçular village road junction, 6 km to Okçular village, 250 m, 19.04.2004, Varol 4931.

- 234. *Allium flavum*** subsp. *tauricum* (Beser ex Reichb.) Stearn var. *tauricum*
Okçular village road junction, 4 km to Okçular village, 230 m, 13.06.2004, Varol 5533.
Ayvalık-Bağyüzü village, 500-600 m, 13.06.2004, Varol 5544.
Medit. element
- 235. *A. guttatum*** Steven subsp. *guttatum*
Şarlok to Gobeller village 7. km, 500 m, 13.06.2004, Varol 4504;
- 236. *Scilla bifolia*** L.
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 06.03.2004, Varol 4644.
Medit. element?
- 237. *Ornithogalum sigmoideum*** Freyn & Sint.
Gobeller village road junction, 1. km, 450-500 m, 19.04.2004, Varol 4951.
Av.-Sib. element
- 238. *O. orthophyllum*** Ten.
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5051;
- 239. *Muscari comosum*** (L.) Miller
Hisarköy-Ayvatlar road junction, 435 m, 19.04.2004, Varol 4917;
Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 13.06.2004, Varol 5508.
Medit. element
- 240. *M. neglectum*** Guss.
Kozak-Ayvalık road, Ayvalık'a 30. km kala roadn sağ ve sol tarafları, 380 m, 19.04.2004, Varol 4925.
- 241. *Gagea bohemica*** (Zauschn.) Schult. & Schult. fil.
Şarlok locale, 480- m, 06.03.2004, Varol 4654.

IRIDACEAE

- 242. *Crocus biflorus*** subsp. *nubigena* (Herb.) Mathew
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 06.03.2004, Varol 4645.
End., E. Medit. element
- 243. *C. pallasii*** Goldb. subsp. *pallasii*
From Yukarıbey to Karaali 3 km. roadside , 450 m, 01.11.2003, Varol 4585;
Kozak-Ayvalık road, 39 km to Ayvalık, roadside, 460 m, 02.11.2003, Varol 4596.
- 244. *C. pulchellus*** Herb.
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 01.11.2003, Varol 4578.
E. Medit. element

ORCHIDACEAE

- 245. *Limodorum abortivum*** (L.) Swartz
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5044.
- 246. *Spiranthes spiralis*** (L.) Chevall.
Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 460 m, 02.11.2003, Varol 4599.
Medit. element?
- 247. *Neotinea maculata*** (Desf.) Stearn
Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 4891.
Medit. element
- 248. *Orchis papilionacea*** L.
Okçular village road junction, 3 km to Okçular, 315 m, 19.04.2004, Varol 4949.
- 249. *O. provincialis*** Babils ex DC.
Bergama-Kozak road 24. km, Porsukburnu, 480 m, 19.04.2004, Varol 4888.
Medit. element

250. *Dactylorhiza romana* (Seb.) Soo subsp. *romana*

Bergama-Kozak road 24. km, Porsukburnu, 480 m, 19.04.2004, Varol 4889.

Medit. element

JUNCACEAE

251. *Juncus articulatus* L.

Bergama-Kozak road 24. km, Porsukburnu, 480 m, 19.04.2004, Varol 4769.

Av.-Sib. element

CYPERACEAE

252. *Carex otrubae* Podp.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 12.06.2004, Varol 5446.

Av.-Sib. element

253. *C. flacca* subsp. *serrulata* (Biv.) Greuter

Hisarköy-Ayvatlar road junction, 435 m, 19.04.2004, Varol 4916;

POACEAE (GRAMINEAE)

254. *Aegilops umbellulata* Zhuk. subsp. *umbellulata*

Okçular village road junction, 6 km to Okçular village, 250 m, 30.05.2004, Varol 5209;

Ir.-Tur. element

255. *Ae. triuncialis* L. subsp. *triuncialis*

Kozak-Ayvalık road, 40 km to Ayvalık, roadside, 485 m, 29.05.2004, Varol 5140;

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5319;

256. *Hordeum murinum* subsp. *leporinum* (Link) Arc. var. *leporinum*

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5005.

257. *H. bulbosum* L.

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5304;

258. *Bromus intermedius* Guss.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5007.

259. *B. tectorum* L.

Hisarköy-Ayvatlar road junction, 435 m, 19.04.2004, Varol 4919.

***260. *B. sterilis* L.**

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5320.

261. *Avena barbata* Pott ex Link subsp. *barbata*

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 385 m, 29.05.2004, Varol 5144;

Ayvalık-Bağyüzü village entrance, 480 m, 30.05.2004, Varol 5326;

Medit. element

262. *Arrhenatherum palaestinum* Boiss.

Kozak-Ayvalık road, 37-38 km to Ayvalık, roadside, 440 m, 30.05.2004, Varol 5163.

E. Medit. element

263. *Aira elegantissima* subsp. *ambigua* (Arc.) M. Doğan

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, 5031.

Medit. element

264. *Lagurus ovatus* L.

Okçular village road junction, 4 km to Okçular village, 230 m, 13.06.2004, Varol 5532.

Medit. element

265. *Gastridium ventricosum* (Gouan) Schinz & Thell.

Okçular village road junction, 4 km to Okçular village, 230 m, 13.06.2004, Varol 5531.
Medit. element

266. *Phleum exaratum* Hochst. ex Griseb. subsp. *exaratum*

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 13.06.2004, Varol 5546.

267. *Lolium perenne* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 4992;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5312.
Av.-Sib. element

268. *L. rigidum* Gaudin var. *rigidum*

Şarlok to Gobeller village 6. km, 580 m, 13.06.2004, Varol 5493;

269. *Vulpia ciliata* Dumort. subsp. *ciliata*

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5049.

270. *Poa bulbosa* L.

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 19.04.2005, Varol 4828;
Ayvalık-Bağyüzü village, 500-600 m, 19.04.2004, Varol 4983.

271. *Dactylis glomerata* subsp. *hispanica* (Roth) Nyman

Bergama-Kozak road 20-22. km, Soğanlı locale, 400-500 m, 29.05.2004, Varol 5014;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5297;

272. *Cynosurus echinatus* L.

Okçular village road junction, 6 km to Okçular village, 220 m, 18.08.2003, Varol 4570;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5263.
Medit. element

273. *Briza maxima* L.

Okçular village road junction, 6 km to Okçular village, 220 m, 18.08.2003, Varol 4576;
Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5280.

274. *Stipa bromoides* (L.) Dörfel.

Ayvalık-Bağyüzü village, Burhaniye road 2 km., 550-600 m, 30.05.2004, Varol 5259.
Medit. element

