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Trees and shrubs of Kos Island (Dodecanese, Greece)*

Abstract

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From May 28th to June 15th, 1993, floristic dendrological field studies were conducted on Kos Is. The wild woody flora of Kos has 87 species, 12 of which are new for the island, first reported by the author (*Lonicera implexa*, *Lycium europaeum*, *Medicago arborea*, *Nicotiana glauca*, *Phillyrea latifolia*, *Pistacia atlantica*, *Amygdalus webbii*, *Populus alba*, *Quercus infectoria*, *Rosa sempervirens*, *Ruscus aculeatus*, *Tamarix tetrandra*). For some species a point maps of distribution were elaborated, mainly on the basis of our own herbarium and field notes. Moreover, the alphabetical list of cultivated trees and shrubs was also presented.

Additional key words: flora, trees, shrubs, Greece, Kos.

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INTRODUCTION

Kos, the third in size after Rhodos and Karpathos, island of the Dodecanese is located in the south-eastern part of the Aegean Sea, near the south-western shores of Anatolia, between the Resadiye and Bodrum Peninsula. North of Kos there lies Pserimos and Kalimnos, and south of it Yiali and Nissiros. Its area covers 290 km², the maximum length in a straight line from north-east to south-west is 45 km, the greatest breadth is about 10 km and the smallest breadth is only 2 km, the coastline has 112 km. The north and central part of the island, along the southern shores, is occupied by the mountain range of Dikaio, with the highest top Ag. Oromdeon, 846 m. At the southern confines of

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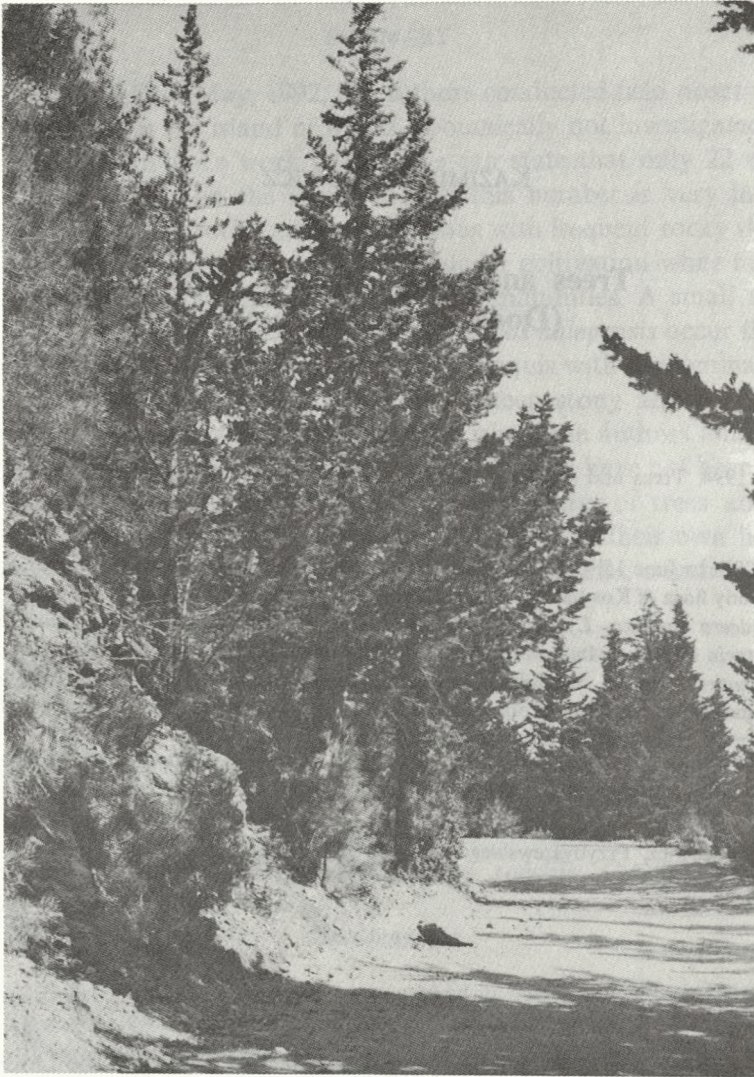


Fig. 1. The edge of *Cupressus sempervirens* forest between Zia Aspendiou and Asomatos. (Photo K. Browicz)

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the island, south of Kephalos, the tallest mountains are: Zini – 354 m and Latra – 426 m.

The lowlands areas, especially in the north, are used for farming purposes and by plantation of olive-tree, orchards and vineyards. At the northern and north-western coasts, from the town of Kos throughout Tigaki and Marmari up to Mastichari, and the southern ones near Kardamena and Agios Stefanos, the very attractive beaches are spread with many recreative buildings: hotels,

pensions, restaurants and cafes. Such buildings occupy still larger and larger terrain, so the natural vegetation is here in great part devastated.

The forests are preserved chiefly in the central part of the island, on the northern and western slopes of Oros Dikaio (Fig. 1), when the southern slopes are covered by olive-tree. They are the cypress (*Cupressus sempervirens f. horizontalis*) and pine (*Pinus brutia*) forests. Cypress is occurring also in the plains, but probably on such places is only in culture. Pine, except Mt. Dikaio forms more or less developed patches in Plaka (south of Antimachia) and on the slopes of Mount Zia and Latra. The broadleaved forests are missing on the island and so common in the Mediterranean region *Platanus orientalis* forming usually the narrow strip of forest along the streams and rivers, here is represented only by singular specimens or small clumps.

Maquis on Kos is rather poor in species and in residual state is preserved only in slight areas, usually along the roads, between the fields and in lower part of the mountain slopes. Such characteristic species for maquis as *Erica arborea*, *Phillyrea latifolia*, *Arbutus andrachne*, *Rhamnus alaternus* or *Pistacia terebinthus* are absent or extremely rare and scattered.

Phrygana is developed on the whole island, but mainly in the lower, southern part, south of Antimachia, where it covers considerably wide very dry areas. Probably it often replaces the forests and maquis after fires. Also phrygana is represented in the south by few species of small shrubs, which change locally the typical composition, limited often to 2-3 species. The commonest are: *Genista acanthoclada*, *Sarcopoterium spinosum*, *Cistus incanus*, *Erica manipuliflora*, *Coridothymus capitatus*, *Anthyllis hermanniae* and even *Lavandula stoechas*.

We have at our disposal four valuable floristic publications about the island. In the first one, Forsyth-Mayor and Barbey (1894) compiled the list of vascular plants observed on the island up to the end of 19th century - it was only 179 species. Afterwards, Rechinger (1943) in his fundamental work "Flora Aegaea" enriched this data by information from other botanists and his own collection. One year later, Cifferi (1944) published similar work but limited only to the eastern Greek islands, including Kos. Recently Hansen (1980) on the ground of his floristic investigations in the island and summarizing the data from the works of his third predecessors estimated the number of species occurring on the Kos island for almost 980, but in his list also the cultivated species are included (e.g. *Morus nigra*, *Melia azedarah*, *Salix babylonica*). This number is probably not final. Moreover, the species from Kos are also enumerated in the "Flora of Turkey" (Davis 1965-1988).



Fig. 2. The wasteland near Kephalos. (Photo K. Browicz)

I conducted the floristic penetration of the island for 18 days, between May 28th and June 15th, 1993, from the town of Kos and from Kephalos (Fig. 2). During this visit I compiled the list of trees and shrubs and I collected some herbarium specimens. As a result of such search I have found 12 new species for the flora of the island, namely: *Lonicera implexa*, *Lycium europaeum*, *Medicago arborea*, *Nicotiana glauca*, *Phillyrea latifolia*, *Pistacia atlantica*, *Amygdalus webbii*, *Populus alba*, *Quercus infectoria*, *Rosa sempervirens*, *Ruscus aculeatus*,

and *Tamarix tetrandra*. Unfortunately, I was not able to locate some species mentioned by Hansen (1980), e.g. *Periploca graeca*, *Rhamnus oleoides*, *Hypericum hircinum* or *Ruta chalepensis*.

Below I show two lists of species of trees and shrubs established on the island: 1. occurring in the wild state or naturalized, alphabetically by families and genera, 2. cultivated, alphabetically by species. I quote my herbarium specimens (The abbreviation KB = Kos/Browicz) and for more interesting taxa I have prepared a point maps of distribution on the island. My herbarium specimens are deposited at the Herbarium of the Institute of Dendrology, Kórnik, Poland (KOR) and at the Herbarium of the Goulandris Natural History Museum in Kifissia (ATH).

WILD TREES AND SHRUBS

Anacardiaceae

1. *Pistacia atlantica* Desf.

This is a new species for the flora of Kos. It is quite common in the northern and central parts of the island, usually scattered along the road, between the fields and on the lower slopes of the mountains. Probably some specimens are only cultivated (Fig. 3).

Near Asklepion, S of Kos, common, KB 32.

2. *Pistacia lentiscus* L.

This is a very common species throughout the island, but usually represented by singular specimens or small clumps in phrygana and maquis.

3. *Pistacia terebinthus* L.

This species is very rare. According to Forsyth-Mayor and Barbey (1894) it grows between Pyli and Zia Asphendiou. I observed this species only once, unfortunately from the distance, over Zia Asphendiou, on the very steep rock at the lower slope of Mt. Dikaio.

Apocynaceae

4. *Nerium oleander* L.

This species is locally common, along the valley of drying streams, especially in the central part of the island (Fig. 4).

Araliaceae5. *Hedera helix* L.

This species is rather rare and occur in the lower part of Dikaio Oros, especially near Zia Asphendiou.

Asclepiadaceae6. *Periploca graeca* L.

According to Hansen (1980) this species grows "Westl. v. Stadt Kos".

Boraginaceae7. *Lithodoria hispidula* (Sam.) Griseb.

This species I found only once, on the locality mentioned by Hansen (1980) (Fig. 5).

Asklipieion, over the archeological site, small clump inside of the *Cupressus sempervirens* forest - only few specimens, KB 33.

Capparidaceae8. *Capparis spinosa* L.

This species is distributed throughout the island, but usually I observed only single specimens (Fig. 6).

Caprifoliaceae9. *Lonicera etrusca* Savi

This species is represented only on few localities in the central and northern part of the island (Fig. 7).

10. *Lonicera implexa* Aiton

This is a new species for the flora of Kos. I found it only once.

S part of the island, in the deep and narrow gorge near the road from Kephalos to Agios Ioannis, ca 100 m, S of Panagia Palatiani, KB 58 (Fig. 8).

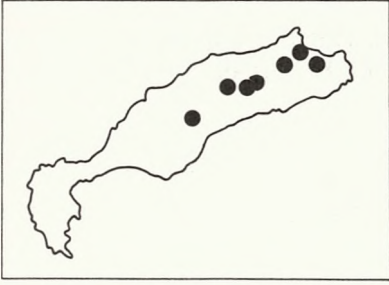
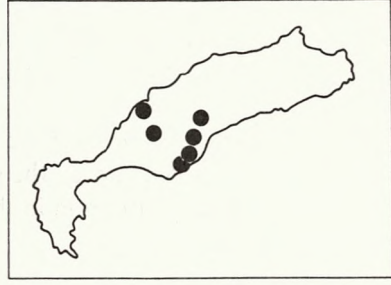
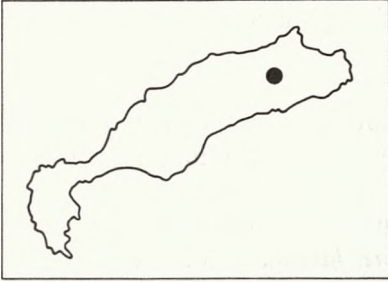
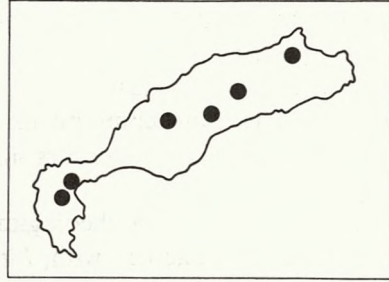
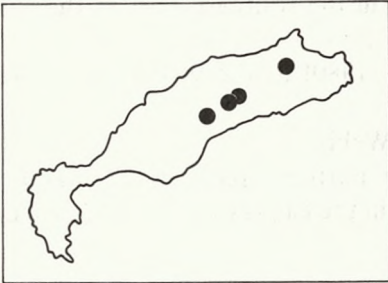
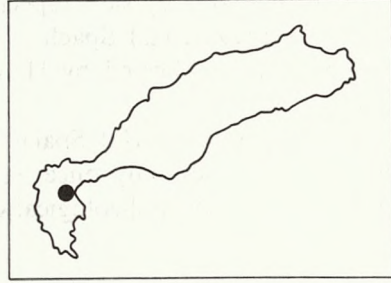
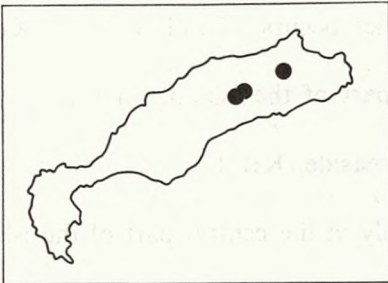
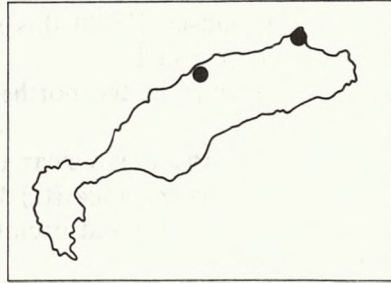
11. *Sambucus nigra* L.

I observed this species in anthropogenic habitats, in Zia Asphendiou and in Asomatos (Fig. 9).

Chenopodiaceae12. *Arthrocnemum macrostachyum* (Moric.) Moris

I found this species only once, but Hansen (1980) mentions it also from another locality, in Lampi (Fig. 10).

Between Tigaki and Marmari, in the northern side of the salt lake "Alykes", common, KB 15.

Fig. 3. *Pistacia atlantica* Desf.Fig. 4. *Nerium oleander* L.Fig. 5. *Lithodora hispidula* (Sam.) Griseb.Fig. 6. *Capparis spinosa* L.Fig. 7. *Lonicera etrusca* Savi.Fig. 8. *Lonicera implexa* Aiton.Fig. 9. *Sambucus nigra* L.Fig. 10. *Arthrocnemum macrostachyum*
(Moric.) Moris.

13. *Atriplex halimus* L.

This species was discovered by Hansen (1980) on the small islet, Agios Nikolaos, next to the southeastern coast of Kos island, vis-a-vis to Agios Stefanos.

14. *Atriplex portulacoides* (L.) Aellen

Near Ammos (N of Kos), near the seaside, at the border of the fixed dunes, KB 2. This species is also common in the northern side of the salt lake, between Tigaki and Marmari.

Cistaceae15. *Cistus incanus* L.

It occurs throughout island, commonly in phrygana, especially in southern and central part.

16. *Cistus parviflorus* Lam.

This species is quite common in the southern part of the island, in the vicinity of Kephalos, but it occurs also in some places in the northern and central parts.

Asklipieion, over the archeological site, small clumps in the *Cupressus sempervirens* forest, together with *Lithodora hispidula*, KB 34.

17. *Cistus salvifolius* L.

It is not so common as *Cistus incana*, but often these two species are occurring together, side by side, especially in the southern part of the island.

18. *Fumana arabica* (L.) Spach

This species was collected by Hansen (1980) in the vicinity of Kos and Kephalos.

19. *Fumana thymifolia* (L.) Spach ex Webb

I found this species only once, in the northern part of the island.

Asklipieion, over the archeological site, in the *Cupressus sempervirens* forest, KB 34.

Compositae20. *Artemisia arborescens* L.

According to Hansen (1980) this species occurs "Westl. v. Stadt Kos".

21. *Centaurea spinosa* L.

I found this species in the northern part of the island, on three places (Fig. 11).

Near Lambi, on the dunes near the seaside, KB 1.

22. *Ptilostemon chamaepeuce* (L.) Less.

This species is very rare and occurs only in the central part of the island. I found it only once.

Below Zia Asphendiou, near the road to Agia Evangelistria, one specimen, KB 44.

Convolvulaceae23. *Convolvulus oleifolius* Desf.

According to Hansen (1980) this species is frequent, especially in the western part of the island, but I found it only once.

Kephalos, below the castle, near the road to Kamari, very rare, KB 48.

Cupressaceae24. *Cupressus sempervirens* L. f. *horizontalis* (Miller) Voss.

This species forms the forests on the northern and northwestern slopes of the mountain range of Dikaio, pure or sometimes with *Pinus brutia*. Moreover, it is quite common in the plains, between the fields and near the road. Perhaps these stands are of secondary character.

25. *Juniperus macrocarpa* Sibth. et Sm.

This species is very common in the southern part of the island, beginning from the salt lake "Alyki" and Mastichari. It is dispersed on the plains and in the lower mountains (e.g. Mt. Latra) up to ca 300 m (Fig. 36). Singular tree-like specimens up to 5-6 m tall with very characteristic umbrella crown are scattered or forms small groups, but between Mastichari and Agios Ioannis or at the seaside near Agios Theologos (SW of Kephalos) it forms extensive and dense thickets or even small forests. The occurrence of *J. macrocarpa* in Kos is the reachest in Greece. I think that the thickets near Agios Theologos can be protected as reservation.

Between Tigaki and Marmari, N of the salt lake "Alykes", few tree-like specimens, KB 16.

Ericaceae26. *Arbutus unedo* L.

This species occurs in the lower part of the mountains, in the remnants of the maquis, but never in bigger groups. On the slopes of Mt. Latra, between Kephalos and Agios Ioannis it was destroyed by fires and it grows here in the form of a small shrub (Fig. 12, 37).

Between Zia Asphendiou and Asomatos, fragment of maquis near the road, KB 41.

27. *Erica manipuliflora* Salisb.

This species is distributed mainly in the southern part of the island, in phrygana both on the plain and on the slopes of the mountains, up to 400 m. In some places it is a dominant element in vegetation (Fig. 13).

Near the top of Mt. Latra (S of Kephalos), common, KB 52.

Fagaceae28. *Quercus coccifera* L.

It is distributed throughout the island, frequent but not common.

29. *Quercus ilex* L.

It occurs in the lower, northern slopes of Oros Dikaio. I observed this species only between Zia Asphendiou and Asomatos.

30. *Quercus infectoria* Oliv.

This is a new species for the flora of Kos, growing only on few localities in the remnant of maquis (Fig. 14).

Between Zia Asphendiou and Asomatos, near the road KB 22. Between Agia Evangelistria and Lagoudi, in the thicket, KB 46a.

31. *Quercus pubescens* Willd.

I found this species only once, probably on the same locality mentioned a 100 years ago by Forsyth-Mayor and Barbier (1894). I observed here also the intermediate form between *Q. pubescens* and *Q. infectoria*.

Between Zia Asphendiou and Asomatos, at the margin of the road, small tree, KB 45.

Guttiferae32. *Hypericum empetrifolium* Willd.

This species is scattered in the mountain region, on the slopes of Oros Dikaio and Mt. Latra (Fig. 15).

Below the top of Mt. Latra, ca 400 m, S of Kephalos, KB 33.

33. *Hypericum hircinum* L.

Hansen (1980) collected this shrub at Zia Asphendiou.

Labiatae34. *Coridothymus capitatus* (L.) Rechb. f.

This species grows throughout the island, but it is more common in the southern part, in the phrygana, in the vicinity of Kephalos.

35. *Lavandula stoechas* L.

It is common in the southern part of the island, sometimes even dominant in phrygana (Fig. 16).

Between Mastichari and Agios Ioannis, fragment of phrygana, KB 30.

36. *Micromeria graeca* (L.) Benth. ex Reichb.

According to Rechinger (1943) and Cifferi (1944) this species was collected on Kos by D. d'Urville in the beginning of 19th century.

37. *Micromeria juliana* (L.) Benth. ex Reichb.

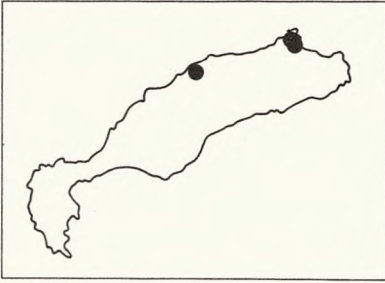
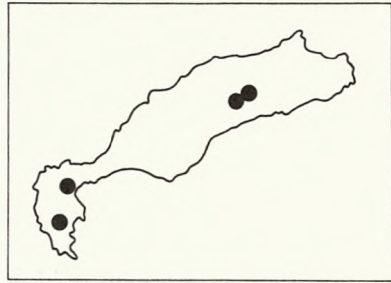
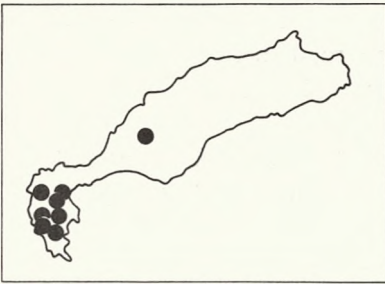
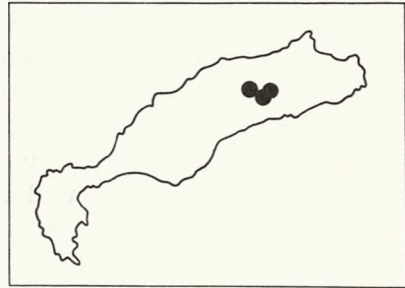
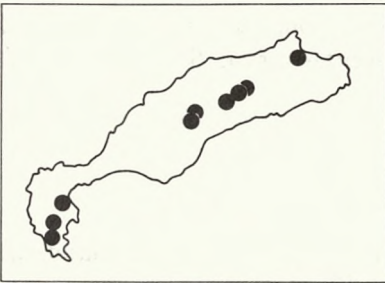
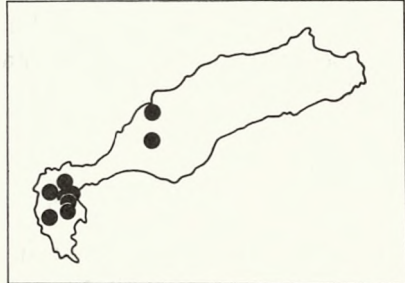
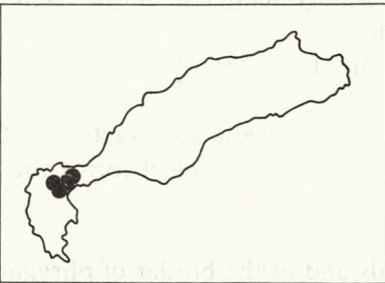
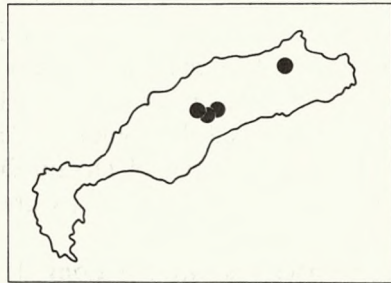
On the hills between Kaka Pynari and Agia Marina., KB 8.

38. *Micromeria myrtifolia* Boiss. et Hohen.

Hansen (1980) collected this species south of the town of Kos and observed in Kephalos.

39. *Micromeria nervosa* (Desf.) Benth.

Hansen (1980) collected this species near Asklipieon and Kephalos.

Fig. 11. *Centaurea spinosa* L.Fig. 12. *Arbutus unedo* L.Fig. 13. *Erica manipuliflora* Salisb.Fig. 14. *Quercus infectoria* Oliv.Fig. 15. *Hypericum empetrifolium* Willd.Fig. 16. *Lavandula stoechas* L.Fig. 17. *Teucrium brevifolium* Schreber.Fig. 18. *Laurus nobilis* L.

40. *Prasium majus* L.

Common species throughout the island, but especially in the northern part. Between Keremetes (Platani) and Asklipieion, KB 36.

41. *Salvia fruticosa* Miller

Common species, but more often in the southern part of the island.

42. *Satureja thymbra* L.

Common species, especially in the southern part of the island.

Between Mastichari and Agios Ioannis, fragment of phrygana, KB 29.

43. *Teucrium brevifolium* Schreber

It grows only in the southern part of the island, in the very dry communities of phrygana, between Kephalos-Limanaki-Drepanon (Fig. 17).

On the lower part of the hill with the ruin of the castle of Kephalos, KB 49. Over Agios Stefanos, near the secondary road, between Kephalos and the cross-road Agios Stefanos and Antimachia, KB 55.

44. *Teucrium divaricatum* Sieb.

This species is occurring throughout the island, but scattered.

Near the road from Pyli to Kardamena, not far from Pyli, KB 26.

Lauraceae45. *Laurus nobilis* L.

It is rather rare species. I observed it only in few localities: between Kermetes and Asklipieion; over Zia Asphendiou, on the lower slope of Oros Dikaio; between Zia Asphandiou and Asomatos; near the eastern confines of Lagoudi (Fig. 18).

Leguminosae46. *Anagyris foetida* L.

This species is very common in the northern part of the island, where it forms sometimes the small clumps (Fig. 19).

47. *Anthyllis hermanniae* L.

This species is quite common, but usually scattered, more often in the southern part of the island, near Kephalos.

Between Mastichari and Agios Ioannis, fragment of phrygana, KB 28.

48. *Calicotome villosa* (Poiret) Link

It is distributed throughout the island, in phrygana and wasteland. On the lower, southern slopes of Dikaio Oros, N of Kardamena it forms the bigger clumps but usually the shrubs are small, ca 1 m tall.

49. *Ceratonia siliqua* L.

This species is sattered along the roads and at the border of phrygana and maquis. It is rather rare (Fig. 20).

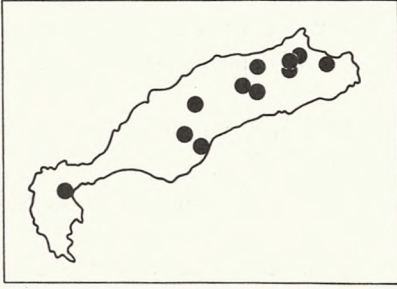


Fig. 19. *Anagyris foetida* L.

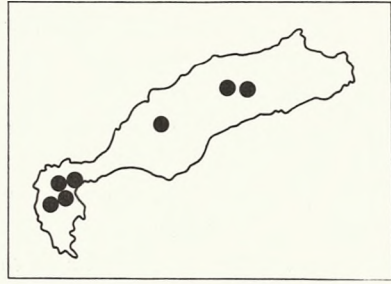


Fig. 20. *Ceratonia siliqua* L.

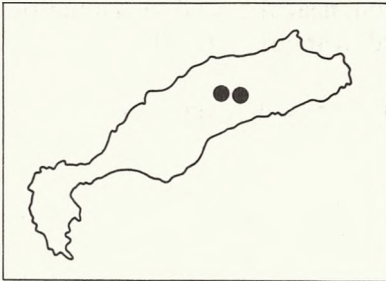


Fig. 21. *Cercis siliquastrum* L.

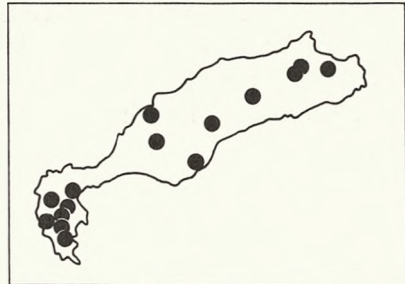


Fig. 22. *Genista acanthoclada* DC.

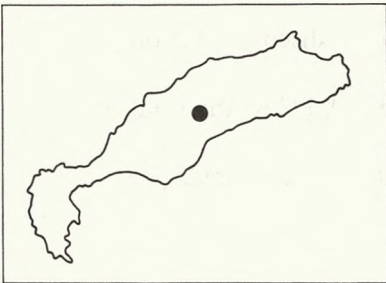


Fig. 23. *Ruscus aculeatus* L.

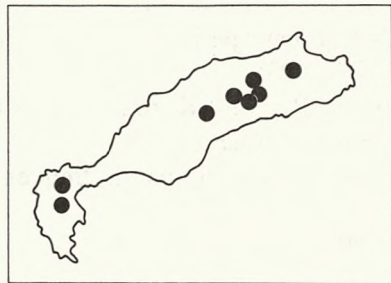


Fig. 24. *Myrtus communis* L.

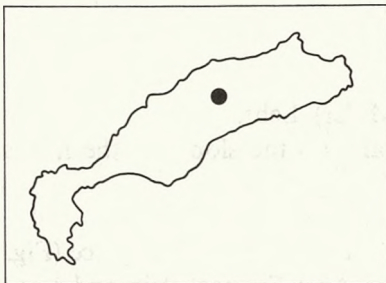


Fig. 25. *Phillyrea latifolia* L.

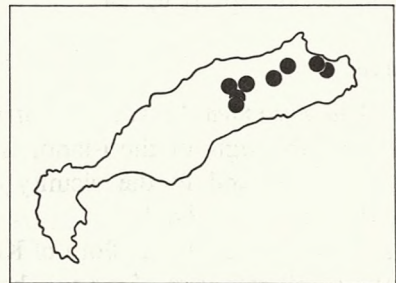


Fig. 26. *Rosa phoenicia* Boiss.

50. *Cercis siliquastrum* L.

It is a very rare species on Kos and I observed it only in the remnant of maquis, between Zia Asphendiou and Asomatos, and near Lagoudi (Fig. 21).

51. *Genista acanthoclada* DC.

This is a common species, especially in the lower regions of the island, abundant in phrygana in the southern part (Fig. 22).

Lower slope of Sympetros near Agia Marina (SE of Kos), scattered, KB 7.

52. *Medicago arborea* L.

This is a new species for the flora of Kos, but the natural status of it is rather doubtful. Probably *M. arborea* is only naturalized - this shrub is cultivated in the town of Kos and in some villages.

At the eastern confines of Zia Asphendiou, near the road to Asomatos, KB 16a; near the road between Kephalos and Kamari, KB 50.

53. *Spartium junceum* L.

It is scattered on the whole island, but usually it is represented by single specimens.

Liliaceae54. *Asparagus acutifolius* L.

This species is frequent on the whole island (more common in the northern part), but usually it is very scattered.

55. *Ruscus aculeatus* L.

This is a new species for the flora of Kos. I discovered it only in one poor locality (Fig. 23)

Between Pyli and Kardamena (ca half way), below the small rock, KB 24.

56. *Smilax aspera* L.

This evergreen climber is frequent but very scattered.

Myrtaceae57. *Myrtus communis* L.

This species is rather rare, usually growing in lower regions, but it never forms bigger clumps (Fig. 24).

Oleaceae58. *Olea europaea* L. var. *sylvestris* (Miller) Lehr.

It occurs throughout the island, especially on the slopes of the mountain range of Dikaio and in the vicinity of Kephalos.

59. *Phillyrea latifolia* L.

It is a new species for the flora of Kos. I found it only in one place (Fig. 25).

In the small remnant of maquis between Agia Evangelistria and Lagoudi, KB 47.

Pinaceae60. *Pinus brutia* Ten.

This is only pine species on Kos forming true forests, especially on the northern slopes of Dikaio Oros, pure or mixed with *Cupressus sempervirens*. Moreover, it occurs also in the southern part of the island on the Mt. Zini and Latra forming sometimes the clumps with participation of *Juniperus macrocarpa*. Small forest of this species is developed at Plaka, south of Antimachia.

Platanaceae61. *Platanus orientalis* L.

This tree is dispersed on the island, but mostly as single specimens or in small clumps at the dried banks of streams.

Ranunculaceae62. *Clematis cirrhosa* L.

This species is quite common in the northern and central parts of the island, and sometimes it occurs abundantly.

Between Kermetes (Platani) and Asklipieion, common in the wayside thickets, KB 10; between Zia Asphendiou and Asomatos, fragment of the maquis, KB 43.

Notice: *Clematis orientalis* L. This species was the first time mentioned from Kos by Forsyth-Mayor and Barbey (1894) "ad sepes prope Antimachia", and this information was repeated by Rechinger (1943), Davis (1965) and Hansen (1980). I think that the occurrence of this species in Kos is rather doubtful. How strange it is that Forsyth-Mayor and Barbey did not enumerated so common *Clematis cirrhosa*, but only *C. orientalis*. Just lately the herbarium specimen of Forsyth-Mayor was confirmed by Brandenburg, van der Neut and Jarvis (Belmontia n. ser. 19: 125, 1987).

Rhamnaceae63. *Rhamnus oleoides* L.

According to Hansen (1980) this species is occurring near Lagoudi and Kephalos.

Rosaceae64. *Amygdalus webbii* Spach

It is a new species for the flora of Kos. I found this almond only in one place, but unfortunately in vegetative state, so the determination can be doubtful.

Between Pyli and Kardamena (half way), on the rocks, single specimen, KB 27.

65. *Prunus divaricata* Ledeb.

This species was collected by Davis (no. 40444), but probably it is only a cultivated form.

66. *Pyrus spinosa* Forsskål

It grows on scattered stands throughout the island. The old specimens I observed in the plain, between the fields.

67. *Rosa phoenicia* Boiss.

Nilsson (in Davis 1972) and Hansen (1980) enumerated from Kos the hybride rose *R. canina* × *R. phoenicia* but I collected (determined by Zieliński, Kórnik) and observed only *R. phoenicia*. *R. canina* is not represented on Kos.

R. phoenicia grows quite often in the northern part of the island, between Kos-Asklipieion-Agia Marina and between Zipari-Lagoudi-Zia Asphendiou-Asomatos forming quite dense and big clumps near the road and between the fields (Fig. 26).

Near Kaka Pynari (SE of Kos) near the new recreative buildings and in abandoned gardens, KB 5; between Kermetes (Platani) and Asklipieion, some clumps near the road, KB 9; lower slope of the Dikaio Oros, just at the outskirts of Zia Asphendiou (road to Pyli), KB 18.

68. *Rosa sempervirens* L.

This is a new species for the flora of Kos. I found it only in one place (Fig. 27).

Between Zia Asphendiou and Asomatos, fragment of maquis not far from the monastery, few clumps, KB 40.

69. *Rubus ulmifolius* Schott

This species is common throughout the island, especially in the northern part and on the plains.

70. *Scopoterium spinosum* (L.) Spach

The species is common in the whole island, especially in the southern part, in phrygana.

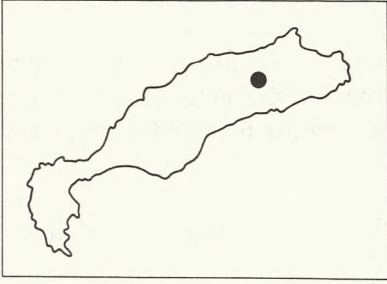
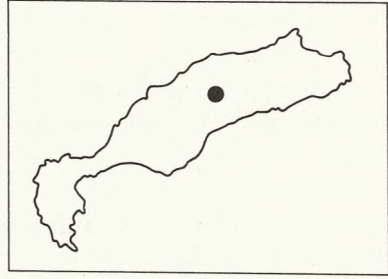
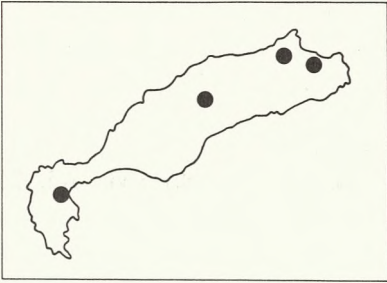
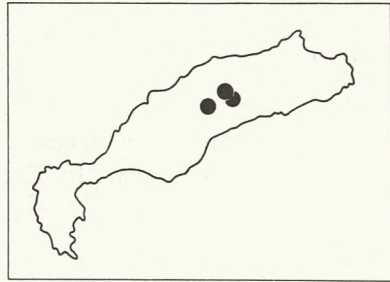
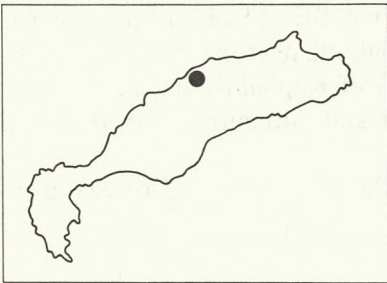
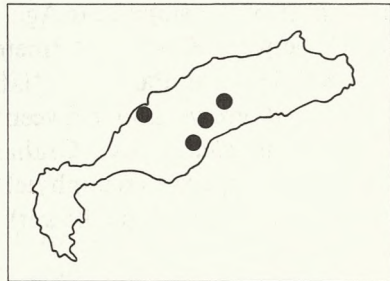
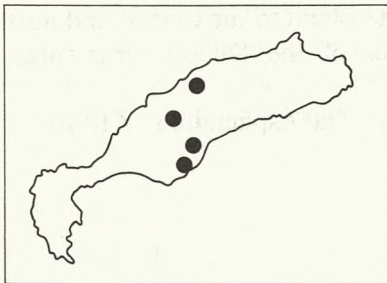
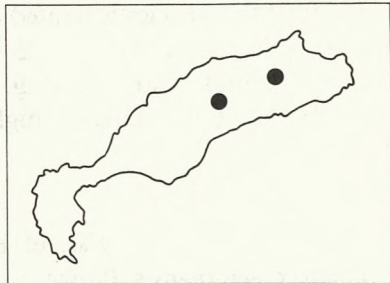
Rubiaceae71. *Rubia tenuifolia* Urv.

It is rather frequent species in the northern part of the island, often in dense clumps together with *Clematis cirrhosa*.

Between Kermetes (Platani) and Asklipieion, common, KB 12.

Rutaceae72. *Ruta chalepensis* L.

This species was discovered by Rechinger (1943) in the central part of the island, between Pyli and Kardamena.

Fig. 27. *Rosa sempervirens* L.Fig. 28. *Salix alba* L.Fig. 29. *Lycium europaeum* L.Fig. 30. *Styrax officinalis* L.Fig. 31. *Tamarix tetrandra* Pallas
ex M. Bieb.Fig. 32. *Daphne gnidioides* Jaub. et Spach.Fig. 33. *Thymelaea hirsuta* (L.) Endl.Fig. 34. *Ulmus minor* Miller.

Salicaceae73. *Populus alba* L.

This is a new species for the flora of Kos. It is cultivated, but maybe it is native in one place, at the southern confines of Kermetes (Platani) where it grows at the bank of small, seasonal stream, forming the clump composed with few trees.

74. *Salix alba* L.

Hansen (1980) mentioned this species "Westl. v. Stadt Kos". I found it only in one place (Fig. 28).

Between Agia Evangelistria and Lagoudi, some clumps, together with *Ulmus minor*, KB 46.

Santalaceae75. *Osyris alba* L.

It grows only in some places.

Near the road from Pyli to Kardamena, not far from Pyli, KB 25.

Solanaceae76. *Lycium europaeum* L.

This is a new species for the flora of Kos. I found it on four stands (Fig. 29).

Lower part of the slope near Agia Marina, SE of Kos, at the border of the road, KB 6; between Kos and Kermetes (Platani), near the road, under *Pistacia atlantica*, KB 13; near Panagia Palatini, S of Kephalos, few shrubs near the ruin, KB 56. It grows also between Pyli and Amaniou, near the road.

77. *Nicotiana glauca* R.C. Graham

This is a new species (xenophyte) for the flora of Kos. I observed it only between Kos and Zipari (in flower).

Styracaceae78. *Styrax officinalis* L.

The range of this species is limited on the island to the central and northern parts. It is quite common on the slopes of the Dikaio Oros, near Zia Asphendiou, Lagoudi and Pyli (Fig. 30).

Lower slopes of Mt. Dikaio, higher of Zia Asphendiou, KB 19.

Tamaricaceae79. *Tamarix hampeana* Boiss. et Heldr.80. *Tamarix smyrnensis* Bunge

These two species are mentioned by Hansen (1980). Indeed, the tree-like

specimens of tamarisk are common along the beaches, but unfortunately during my visit on Kos I did not find any specimens with flowers, so I cannot confirm his opinion.

81. *Tamarix tetrandra* Pallas ex M. Bieb.

It is very common shrub between Tigaki and Marmari, near the northern border of the salt lake "Alykes", KB 14 (determined by Zieliński, Kórnik) (Fig. 31).

Thymelaeaceae

82. *Daphne gnidioides* Jaub. et Spach.

This species occurs mostly on the slopes of the Dikaio Oros, but I observed it also between Mastichari and Agios Ioannis and near the road from Kardamena to Pyli, near Agios Nikolaos (Fig. 32).

Lower slope of Diakio Oros, over Zia Asphendiou, many shrubs up to 1 m tall, KB 17.

83. *Thymelaea hirsuta* (L.) Endl.

This species is occurring quite commonly at the southern confines of Kardamena and between Linopotis and Antimachia (Fig. 33).

Road from Kardamena to Pyli, lower part of Dikaio Oros, KB 31.

84. *Thymelaea tartonraira* (L.) All. subsp. *argentea* (SM) Holmboe

This shrub grows mostly in the southern part of the island, in phrygana, but usually is represented by single specimens.

Ca 2 km S of Kephalos, at the border of the road to Agios Ioannis KB 51; over Agios Stefanos, on the hills near the secondary road between Kephalos and the cross-road Agios Stefanos and Antimachia, KB 54.

Ulmaceae

85. *Celtis australis* L.

Hansen (1980) observed this species in Zia Asphendiou. I found it only in the park of Kos, near the Hippokrates plane tree (cult.?).

86. *Ulmus minor* Miller

This species was observed only in the northern part of the island. The most interesting stand of this tree is located at the eastern confines of Lagoudi, where it grows in the compact thicket together with *Salix alba*, *Rubus ulmifolius*, *Laurus nobilis*, *Rosa phoenicia* and *Myrtus communis* (Fig. 34).

Between Kermetes (Platani) and Asklepion, small clump near the road KB 11.

Verbenaceae

87. *Vitex agnus-castus* L.

This species is represented on many stands, here and there, but usually by few specimens (Fig. 35).

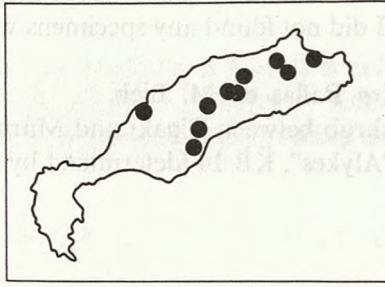


Fig. 35. *Vitex agnus-castus* L.

A



B



C



Fig. 36. (a) *Pinus brutia* (left) and *Juniperus macrocarpa* (right) between Kephalos and Agios Ioannis. (b) The old specimen of *Juniperus macrocarpa* between Kephalos and Agios Theologos. (c) The old specimens of *Juniperus macrocarpa* near Mastichari. (Photo K. Browicz)

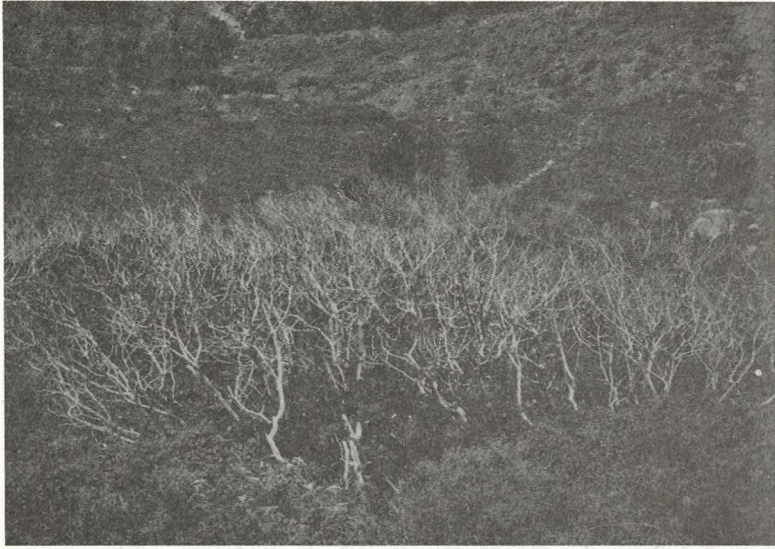


Fig. 37. The burnt but growing again group of *Arbutus unedo* on the northern slope of Mt. Latra.
(Photo K. Browicz)

INTRODUCED TREES AND SHRUBS

It has also been my intention to make up a list of introduced species on Kos, mainly those which have been outplanted in parks, squares, along streets and roads, and near houses, especially in the town of Kos. I ignored the trees and shrubs which are occurring in the private gardens, so the list presented here would have been probably richer.

1. *Acacia cyanophylla* Lindley
2. *Ailanthus altissima* (Miller) Swingle
3. *Albizia julibrissin* Durazz.
4. *Amygdalus communis* L.
5. *Armeniaca vulgaris* L.
6. *Araucaria heterophylla* (Salisb.) Franco
7. *Bauhinia* sp.
8. *Bougainvillea spectabilis* Willd.
9. *Brachychiton diversifolius* (Hook.) Dietr.
10. *Buxus sempervirens* L.
11. *Caesalpinia gillesii* (Hook.) Dietr.
12. *Campsis radicans* (L.) Seeman
13. *Cassia* sp.
14. *Casuarina equisetifolia* Forest.
15. *Cercis siliquastrum* L.

16. *Citrus* sp.
17. *Cupressus sempervirens* L. f. *sempervirens*
18. *Datura arborea* L.
19. *Eriobotrya japonica* (Thinb.) Lindley
20. *Eucalyptus* sp. nonn.
21. *Euonymus japonicus* L.
22. *Ficus carica* L.
23. *Ficus benjamina* L.
24. *Ficus elastica* Roxb.
25. *Hedera helix* L. - forms
26. *Hibiscus rosa - sinensis* L.
27. *Hibiscus syriacus* L.
28. *Jacaranda mimosifolia* Don
29. *Jasminum officinale* L.
30. *Justicia* sp.
31. *Lantana camara* L.
32. *Laurus nobilis* L.
33. *Ligustrum lucidum* Aiton f.
34. *Lonicera japonica* Thunb.
35. *Medicago arborea* L.
36. *Melia azedarach* L.
37. *Morus alba* L.
38. *Morus nigra* L.
39. *Myrtus communis* L.
40. *Nerium oleander* L.
41. *Olea europaea* L. var. *europaea*
42. *Parthenocissus quinquefolia* (Sieb. et Zucc.) Planch.
43. *Persica vulgaris* Miller
44. *Phoenix canariensis* hort ex Chabaud
45. *Pinus halepensis* Miller
46. *Pinus pinea* L.
47. *Pittosporum tobira* (Thunb.) Aiton f.
48. *Platanus* × *acerifolia* (Aiton) Willd.
49. *Platanus orientalis* L.
50. *Platycladus orientalis* (L.) Franco
51. *Plumeria rubra* L.
52. *Populus alba* L.
53. *Populus* cv. 'Afghanica'
54. *Prunus divaricata* Ledeb. - forms
55. *Prunus* × *domestica* L.
56. *Punica granatum* L.
57. *Pyracantha coccinea* Roemer

58. *Pyrus communis* L. - forms
59. *Quercus ilex* L. - as street tree in the town of Kos
60. *Ricinus communis* L.
61. *Robinia pseudoacacia* L.
62. *Rosa* sp. - forms
63. *Rosmarinus officinalis* L.
64. *Schinus molle* L.
65. *Tamarix* sp. - tree forms
66. *Thevetia peruviana* (Pers.) Schum.
67. *Viburnum tinus* L.
68. *Vitis vinifera* L.
69. *Washingtonia filifera* Chaub.
70. *Wisteria floribunda* (Willd.) DC.

SUMMARY

From 28th May to 15th June, 1993, the author conducted field observations of trees and shrubs on the island of Kos. Basing on his own herbarium collections and field notes and also on data from the literature (Forsyth-Mayor, Barbey, 1894; Rechinger, 1943; Cifferi, 1944; Hansen, 1980; Davis (ed.), 1965-1988), it was established that on Kos there grow in the wild state 87 species of trees and shrubs, 12 of which are new for the island, never mentioned in hitherto existing publications. Only 3 species belong to *Gymnospermae* (*Cupressus sempervirens* f. *horizontalis*, *Juniperus macrocarpa*, *Pinus brutia*), and 84 to *Angiospermae*. They belong to 36 families and 68 genera. Richest in the number of species are the families *Labiatae* (10), *Leguminosae* (8), *Rosaceae* (7), *Cistaceae* (5) and *Fagaceae* (4). For 33 species the author prepared the point maps of distribution on Kos.

The author gives two lists of trees and shrubs represented on the island. One list, in alphabetical order by families and genera, refers to the wild growing species. Besides a short characteristic of their occurrence, the author's herbarium materials are quoted. These materials are stored at the Herbarium of the Institute of Dendrology of the Polish Academy of Sciences in Kórnik and at the Goulandris Natural History Museum in Kifissia, Greece.

The other list contains the introduced trees and shrubs, planted in parks, along the streets and roads and near houses. The number of such trees and shrubs, according to observations of the author is 70, but it can be supposed that this number is higher, because the species cultivated in the private gardens are not included.

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Drzewa i krzewy wyspy Kos (Grecja)

Streszczenie

W roku 1993, od 28 maja do 15 czerwca autor prowadził poszukiwania terenowe poświęcone drzewom i krzewom występującym na wyspie Kos. Opierając się na własnych zbiorach zielnikowych i notatkach, a także na danych z literatury florystycznej (Forsyth-Mayor, Barbey, 1894; Rechinger, 1943; Cifferi, 1944; Hansen, 1980; Davis (red.), 1965-1988) stwierdzono, że na Kos w dzikim stanie występuje 87 gatunków drzew i krzewów, z czego 12 okazało się nowymi dla flory tej wyspy, nie wymienionymi w dotychczasowych publikacjach. Na *Gymnospermae* przypadają zaledwie 3 gatunki (*Cupressus sempervirens* f. *horizontalis*, *Juniperus macrocarpa*, *Pinus brutia*), a na *Angiospermae* 84. Należą one do 36 rodzin i 68 rodzajów. Najbogatszymi pod względem liczby gatunków są następujące rodziny: *Labiatae* (10), *Leguminosae* (8), *Rosaceae* (7), *Cistaceae* (5), *Fagaceae* (4). Dla 33 gatunków autor opracował punktowe mapy rozmieszczenia na wyspie.

Autor zestawił dwie listy gatunków drzew i krzewów występujących na Kos. Pierwsza z nich, w układzie alfabetycznym według rodzin i rodzajów, dotyczy gatunków dziko rosnących. Zostały one scharakteryzowane pod względem sposobu występowania, przy czym dla wielu gatunków autor cytuje własne zbiory zielnikowe. Zbiory te przechowywane są w Zielniku Instytutu Dendrologii PAN w Kórniku oraz w Zielniku Goulandris Natural History Museum w Kifissia, w Grecji.

Druga lista obejmuje gatunki na wyspie introdukowane, sadzone w parkach, na ulicach, przy drogach i koło domów, zwłaszcza w mieście Kos. Takich gatunków autor zaobserwował siedemdziesiąt. Należy jednak przypuszczać, że jest ich więcej, gdyż lista ta nie obejmuje roślin uprawianych w prywatnych ogrodach.