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Woody flora of Zakynthos Island (Greece)*

Abstract

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Having penetrated floristically Zakynthos Is. for 10 days, from May 21st to 30th 1988, the authors have compiled a list of tree and shrub species occurring there in the wild state. For each species they have developed a point map of distribution, mainly on the basis of own herbarium collections and the floristic lists prepared in the field. It appears that on Zakynthos Is. presently there grow 72 such species, of which 15 proved to be new for the flora of the island compared with the list compiled by K. Ronniger in 1941.

Additional key words: Flora, trees, shrubs.

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INTRODUCTION

The western Greek island Zakynthos (Zante), the most southern in the Ionian Sea is located northwest of the Peloponnisos peninsula from which it is separated by a distance of only 15 - 16 km. The area of the island is 402 km² and the shoreline is 417 km long. The island is 37 km long and 18 km wide in its widest part. Except for the northeastern lowland part the island is hilly, and the highest elevation is Oros Vrachionas, 756 m. Only three other mountains exceed 400 m elevation. While on the northeast and east in the majority of cases the shores come down gradually to the sea in the west and southwest the shore is usually inaccessible, ending in tall, almost perpendicular rocks. The lowland part of the island which is more densely inhabited, is occupied by orchards and olive plantations and it is criss-crossed by a rich network of asphalt roads. Here the native vegetation remained only in fragmentary form, usually on edges of cultivated land. Of the woody plants usually only single shrubs of *Pistacia lentiscus*, *Rubus ulmifolius* and *Sarcopoterium spinosum*

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occur. On the other hand the highland part of the island is covered by more or less degraded phrygana (Fig. 1), and only in places, usually in various types of gorges there remain still fragments of maquis and even these are much impoverished (e.g. at the feet of Scopos Mt., south east of Zakinthos town). Forests are formed only by pine (*Pinus halepensis*) primarily in the western part of the island, however, on a restricted area only. Much damage is being done to these forests by fires, the evidence of which we were able to observe in some places.

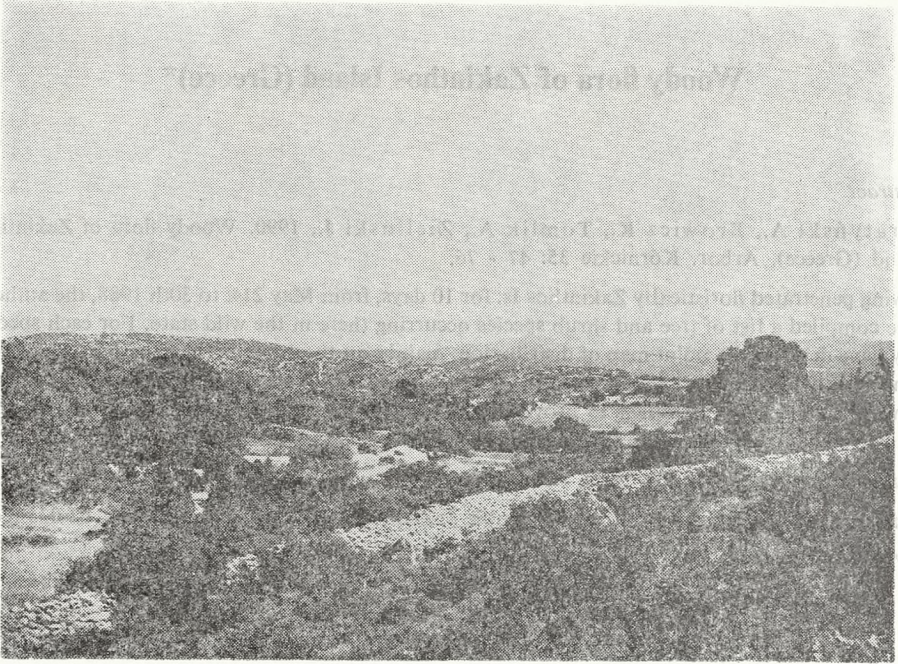


Fig. 1. Massif of Vrachionas — general view (phot. A. Boratyński)

The flora of Zakynthos has not been studied in detail and critically yet and the herbarium specimens originating from the island are poorly represented in European herbaria. However, several studies are known which discuss the flora of the island, these, however, were based on too short sojourns of botanists here and the herbarium materials collected by them are probably inadequate.

The history of floristic studies on Zakynthos Is. from 1795 to 1937 has been presented by Ronniger (1941). First to describe the flora of Zakynthos were Margot and Reuter (1839) basing on herbarium collections made in the years 1835 and 1836 by the Geneva botanist H. Margot. They believed that the flora numbered at the time 636 species including 10 pteridophytes.

An important contribution to the flora of Zakynthos was the publication of Bornmüller (1928) who stayed on the island in the year 1926 and who collected about 200 species. As can be judged from his publication he visited only the eastern part of the island, the vicinity of Zakynthos town, Mts. Skopos and Akrotirion Kriouneri located north of the capital of the island.

Then in 1936, during a week (20 - 27 March) the island was visited by the Austrian botanist K. Ronniger. As a consequence of his stay, on the basis of his own herbarium collections and field notes as well as on the collections of others botanists preceding him here, he compiled the flora of the island determining it to be 804 species and 57 varieties (Ronniger 1941). Thus compared with the study of Margot and Reuter (*l.c.*) the flora of Zakynthos proved to be much richer. Most probably this is not the final number since even we, being interested only in the trees and shrubs, were able to discover species unknown for the island so far. The island of Kefallinia, neighbouring to Zakynthos from the north is more than 200 species richer (Phitos, Damboldt 1985), however, it is much larger and its orography is more diversified (the highest mountain Enos Oros has an elevation of 1628 m).

We have visited Zakynthos in 1988, thus more than 50 years after Ronniger, and we have conducted the floristic penetration of the island for 10 days between May 21st and 30th. Using a field car we were able to move about quickly and to become acquainted with many interesting places, though we still feel that the penetration of the difficult western shores was inadequate. During this visit we have collected numerous herbarium specimens (no. 676 - 800 Iter Graecum VII) and we have compiled lists of trees and shrubs occurring on 70 stands (Fig. 3). As a result of our search we have found 72 species of trees and shrubs including 15 new ones that were not mentioned in the flora of Ronniger (1941). These were the following species: *Arthrocnemum perenne*, *Convolvulus oleifolius*, *Dianthus fruticosus* subsp. *occidentalis*, *Cistus parviflorus*, *Cotinus coggygria*, *Crataegus monogyna**, *Ephedra campylopoda*, *Genista acanthoclada*, *Helianthemum syriacum*, *Laurus nobilis*, *Lavatera bryoniifolia*, *Pistacia terebinthus*, *Quercus pubescens*, *Rhamnus oleoides*, *Thymelaea tartonraira*.

On the other hand we have not found some species of trees and shrubs which are reported by Ronniger, such as: *Pinus pinea*, *Sambucus nigra*, *Celtis australis*, and *Cytisus villosus* (= *C. triflorus*). The latter two species are cited by Ronniger basing on Sibthorp, who is said to have bought in 1795 from some pharmacists a herbarium collected on the island. As regards *Sambucus nigra* it is not unlikely that it grows wild on the island even today, somewhere near homesteads of the local population and that it was missed by us. Also Ronniger mentions from Zakynthos two species of the genus *Tamarix*. The first *Tamarix hampeana*, the herbarium specimen of which collected by Bornmüller has been confirmed by the monograph of the genus *Tamarix* of Baum (1978). While the specimens of *Tamarix* seen by us on Zakynthos were devoid of flowers, which did not allow for correct identification, basing on Baum's authority we have included this species in our list of trees and shrubs occurring wild on the island. The second species was to be *T. pallasii* Desv. (the present correct name is *T. laxa* Willd.), originating from southwest Russia and from west and central Asia, which makes this claim suspect.

From among the species of trees and shrubs seen by us the most common ones, which occur almost throughout the island are: *Pistacia lentiscus*, *Rubus ulmifolius*,

* Margot and Reuter (1839) mention from Zakynthos *Crataegus oxyacantha* L., which of course is an evident error — it is not unlikely that this information concerns *C. monogyna*.

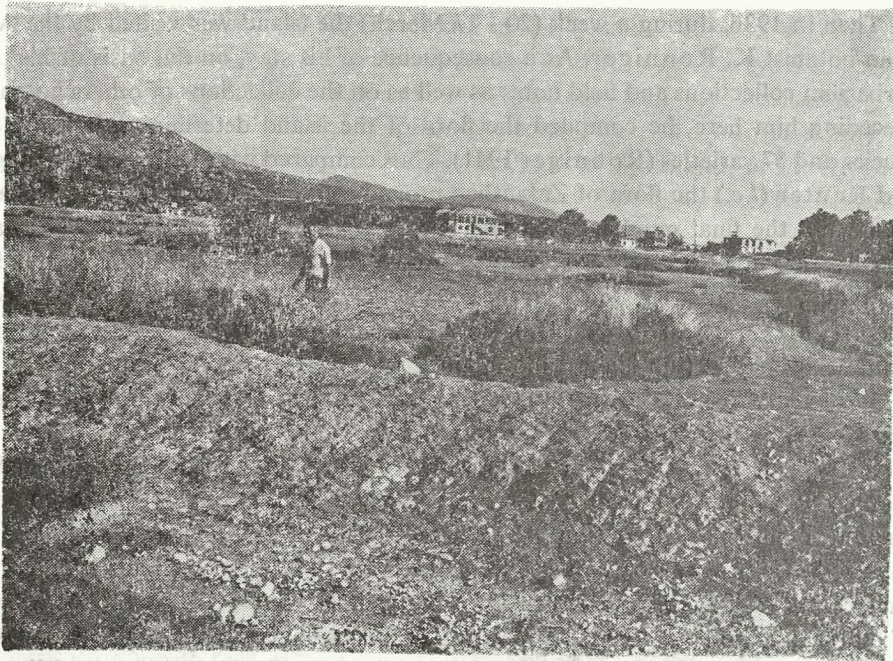


Fig. 2. Fields of salt exploitation (Alykes) between Katastari and the sea shore with fragments of halophytic communities (phot. A. Boratyński)

Sarcopoterium spinosum, *Quercus coccifera*, *Similax aspera*, *Anthyllis hermanniae*, *Calicotome villosa*, *Coridothymus capitatus*, *Spartium junceum*, *Hypericum empetrifolium*, *Phlomis fruticosa*, *Cistus incanus* and *C. salvifolius*, *Pyrus spinosa*, *Ceratonia siliqua* (in single specimens), *Putoria calabrica*. Among the rare or very rare species there are: *Dianthus fruticosus* subsp. *occidentalis*, the stand of which on Zakynthos fills the disjunction known so far between Kafallinia and Peloponnisos (Runemark 1980) *Convolvulus oleifolius*, *Cotinus coggyria*, *Euphorbia dendroides*, *Lavandula stoechas*, *Laurus nobilis*, *Helianthemum syriacum*, *Ephedra campylopoda* and several others. Very interesting is the mass occurrence though only locally of the very rare species for Greece *Hypericum aegypticum* (Fig. 6) and of three species of halophytes (*Arthrocnemum fruticosum*, *A. perenne*, *Halimione portulacoides*) in the region of salt exploitation (Alykes) between Katastari and the sea shore (Fig. 2). These latter communities are, however, very damaged and the discussed species hold on only along melioration ditches.

WILD TREES AND SHRUBS

Below we give the full list of species of trees and shrubs established by us as occurring on the island in the wild state (we have ignored species that are cultivated or which have gone wild from cultivation), alphabetically by families and genera. For each species we quote our own herbarium specimens (the abbreviation BBTZ=

=Boratyński, Browicz, Tomlik, Zieliński) and the numbers of consecutive floristic lists in which the given species has been included (Fig. 3). For each species we have prepared a point map of distribution of the stands on the island (Figs. 8 - 73) except for species of the genera *Micromeria*, *Fumana* and *Tamarix* since we believe that the material we have available for these species is inadequate. Our herbarium specimens from Zakynthos are deposited in the herbarium of the Institute of Dendrology in Kórnik (KOR) and in the herbarium of the Goulandris Natural History Museum in Kifissia, Greece (ATH).

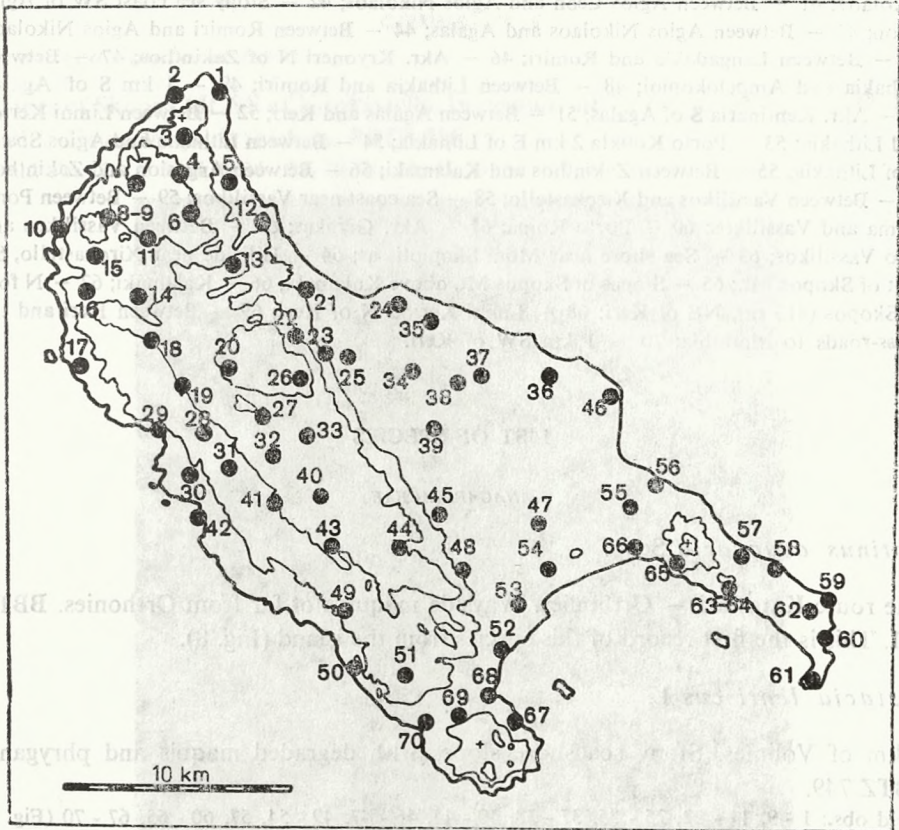


Fig. 3. Localities of field observations

LIST OF LOCALITIES NUMBERS OF WHICH ARE CITED IN FIELD OBSERVATIONS

1 - Akr. Skinari; 2 - Near Korynth, sea coast; 3 - Between Korynth and the cross-roads to Askos; 4 - Between Askos and the road Volimes-Korynth N of Askos; 5 - Between Askos and the sea coast; 6 - Between Volimes and Askos; 7 - 1 - 2 km SW of Korynth; 8 - 1 km NW of Volimes; 9 - 1 km W of Volimes; 10 - Stony sea coast W of Volimes; 11 - Between Orthonies and Volimes; 12 - N of Koroni, stony sea shore; 13 - Between Akr. Katastari and Orthonies;

14 – Between Anafonitria and the cross-roads to Volimes and Orthonies; 15 – Between Agios Dionysios Monastery and Volimes; 16 – Between Anafonitria and Agios Dionysios Monastery; 17 – Porto Vroma; 18 – Between Anafonitria and Maries; 19 – Between Maries and Exo Chora; 20 – Vrachionas Mt. – the summit area; 21 – Between Katastari and Koroni; 22 – Between Gyri and Kallithea; 23 – Between Kallithea and Skoulikado; 24 – Alykes N of Katastari; 25 – Between Agios Dimitrios and Drakas; 26 – 2 km NE of Gyri; 27 – Between Loucha and Gyri; 28 – Between Exo Chora and Kampi; 29 – Kampi; 30 – 1 - 2 km SW of Agios Leon; 31 – Between Kampi and Agios Leon; 32 – Between Agios Leon and Loucha; 33 – 1 - 3 km NW of Agios Nikolaos; 34 – Vicinty of Gerakari; 35 – Between Gerakari and Alykes; 36 – Between Akrotini and Planos; 37 – Between Planos and Tragaki; 38 – Between Tragaki and Gerakari; 39 – Gulara between Agios Kirikos and Langadakia; 40 – 1 km NWW of Agios Likolaos; 41 – Between Agios Leon and Agios Nikolaos; 42 – Stony sea coast SW of Agios Neon; 43 – Between Agios Nikolaos and Agalas; 44 – Between Romiri and Agios Nikolaos; 45 – Between Langadakia and Romiri; 46 – Akr. Kryoneri N of Zakynthos; 47 – Between Lithakia and Ampelokopioi; 48 – Between Lithakia and Romiri; 49 – 1 km S of Agalas; 50 – Akr. Kentinaria S of Agalas; 51 – Between Agalas and Keri; 52 – Between Limni Keriou and Lithakia; 53 – Porto Koukla 2 km E of Lithakia; 54 – Between Lithakia and Agios Sostis, E of Lithakia; 55 – Between Zakynthos and Kalamaki; 56 – Between Argasion and Zakynthos; 57 – Between Vassilikos and Xirokastello; 58 – Sea coast near Vassilikos; 59 – Between Porto Roma and Vassilikos; 60 – Porto Roma; 61 – Akr. Gerakas; 62 – Between Vassilikos and Ano Vassilikos; 63 – Sea shore near Moni Skopiotissas; 64 – Hillside near Xirokastello, SE foot of Skopos Mt.; 65 – Slopes of Skopos Mt. above Kalamaki; 66 – Kalamaki; 67 – N foot of Skopos (413 m), NE of Keri; 68 – Limni Keriou N of Keri; 69 – Between Keri and the cross-roads to Marathia; 70 – 1 km SW of Keri.

LIST OF SPECIES

ANACARDIACEAE

Cotinus coggygria Scop.

The route Katastari – Orthonies. Wayside maquis not far from Orthonies. BBTZ 711. This is the first record of this species from the island (Fig. 8).

Pistacia lentiscus L.

2 km of Volimes. Stony sea shore slopes with degraded maquis and phrygana. BBTZ 749.

Field obs.: 1 - 9, 11 - 22, 25 - 35, 37 - 38, 40 - 44, 46 - 47, 49 - 54, 57, 60 - 65, 67 - 70 (Fig. 9)

Pistacia terebinthus L.

Between Korynth and the cross-roads to Askos and Volimes. In maquis. BBTZ 720. This is the new species for the flora of Zakynthos.

Field obs.: 2 - 7, 12, 21, 27, 33, 52, 65, 67. (Fig. 10)

APOCYNACEAE

Nerium oleander L.

Field obs.: 57, 63, 65 (Fig. 11)

ARALIACEAE

Hedera helix L.

Field obs.: 6, 15, 34, 38 (Fig. 12)

CAPPARIDACEAE

Capparis spinosa L.

Sea shore rocks NE of Askos. BBTZ 728; Walls of the Agios Dionysios Monastery. Rocky slope. BBTZ 765 a; Between Langadakia and Romiri. Ruderal places by the road. BBTZ 785.

Field obs.: 23, 44, 52 - 54, 58, 60, 64 (Fig. 13)

CAPRIFOLIACEAE

Lonicera implexa Aiton

Slopes of Skopos Mt. SE of Xirokastello. In maquis. BBTZ 696 a; Between Orthonies and Volimes. Wayside thickets. BBTZ 716.

Field obs.: 1 - 2, 5 - 6, 8, 10 - 18, 20, 26, 32, 43, 51, 56 - 57, 61 - 62, 64, 67 (Fig. 14)

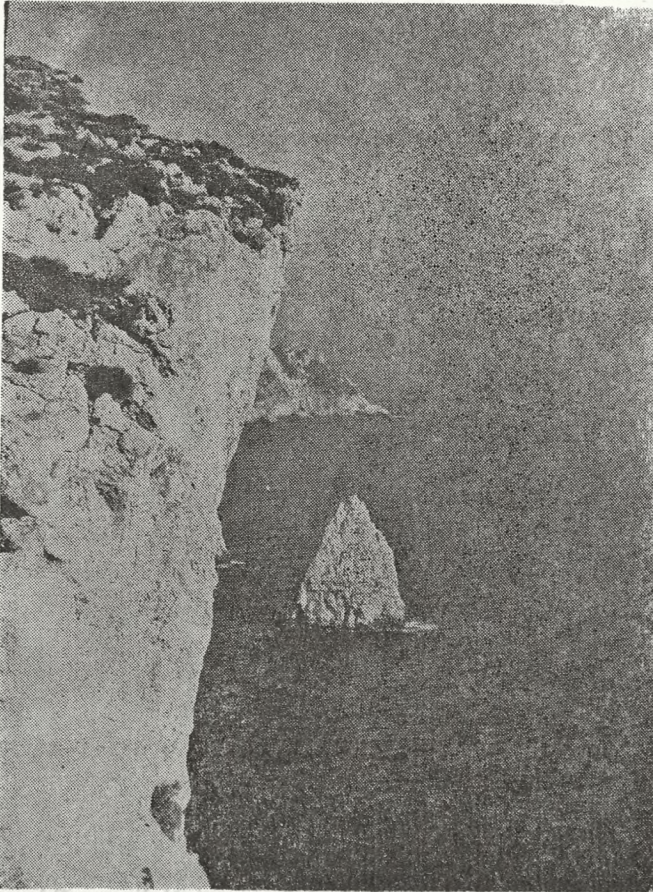


Fig. 4: Cliffs of the Akr. Kentinaria, locality of *Dianthus fruticosus* subsp. *occidentalis* (phot. A. Boratyński)

CARYOPHYLLACEAE

Dianthus fruticosus L. subsp. *occidentalis* Runemark

Akr. Skinari N of Korynth. Vertical calcareous rocks above the sea. Single specimens in rock crevices. BBTZ 733.; Akr. Keri. Rocky ledges of vertical sea shore cliffs. BBTZ 769. This is the new species for the flora of Zakynthos. More information in: Boratyński et al. (1990).

Field obs.: 50 (Fig. 4, 15)

CHENOPODIACEAE

Arthrocnemum fruticosum (L.) Moq.

Alykes. Saline, moist grounds not far from the sea. BBTZ 705. (Fig. 16)

Arthrocnemum perenne (Miller) Moss

Alykes. Saline, moist ground not far from the sea. BBTZ 704. This is the first record this species from the island (Fig. 17)

Halimione portulacoides (L.) Aellen

Alykes. Saline, moist ground not far from the sea. BBTZ 706. (Fig. 18)

CISTACEAE

Cistus incanus L.

Orthonies. Stony wayside. (Flowers white!). BBTZ 718.

Field obs.: 1 - 2, 4 - 6, 9, 11 - 22, 26 - 34, 36, 38, 40 - 41, 43 - 44, 49 - 51, 54, 57, 60 - 65, 69 - 70 (Fig. 19)

Cistus parviflorus Lam.

Degraded maquis and phrygana SW of Anafonitria, by the road towards the sea. BBTZ 741, 744; Between Volimes and the Agios Georgios Monastery. In degraded maquis. BBTZ 756; Vrachionas Mt. NW of Gyri. In phrygana and degraded maquis. BBTZ 779. This is the new species for the flora of Zakynthos.

Field obs.: 8 - 9, 15 - 18, 29, 50 (Fig. 20)

Cistus salvifolius L.

Field obs.: 1 - 2, 5, 7, 9, 12 - 13, 15 - 19, 22, 26, 28, 30 - 33, 36, 38, 40 - 44, 50 - 51, 56 - 57, 60 - 64, 69 - 70 (Fig. 21)

Fumana arabica (L.) Spach

Between Korynth and the cross-roads to Askos and Volimes. Edge of degraded maquis. BBTZ 724; 2 km NW of Volimes. In phrygana. BBTZ 748.

Fumana thymifolia Spach ex Webb

Stony slopes of Skopos Mt. SE of Xirokastello. In phrygana. BBTZ 692.

Helianthemum syriacum (Jacq.) Dum.-Cours.

Degraded maquis and phrygana SW of Anafonitria, by the way towards the sea_s BBTZ 740; Between Agalas and Akr. Kentinaria. In phrygana. BBTZ 765 a. This is the new species for the flora of Zakynthos (Fig. 22)

COMPOSITAE

Ptilostemon chamaepeuce (L.) Less.

N of Koroni. Calcareous slopes not far from the sea. BBTZ 709; N foot of Skopos Mt. NE of Keri. Rocky sea shore. BBTZ 771; Rocky sea shore near Ano Vassilikos E of Zakynthos. In maquis. BBTZ 795.

Field obs.: 1, 10, 17, 29, 46, 50, 54, 58, 67 - 68 (Fig. 5, 23)

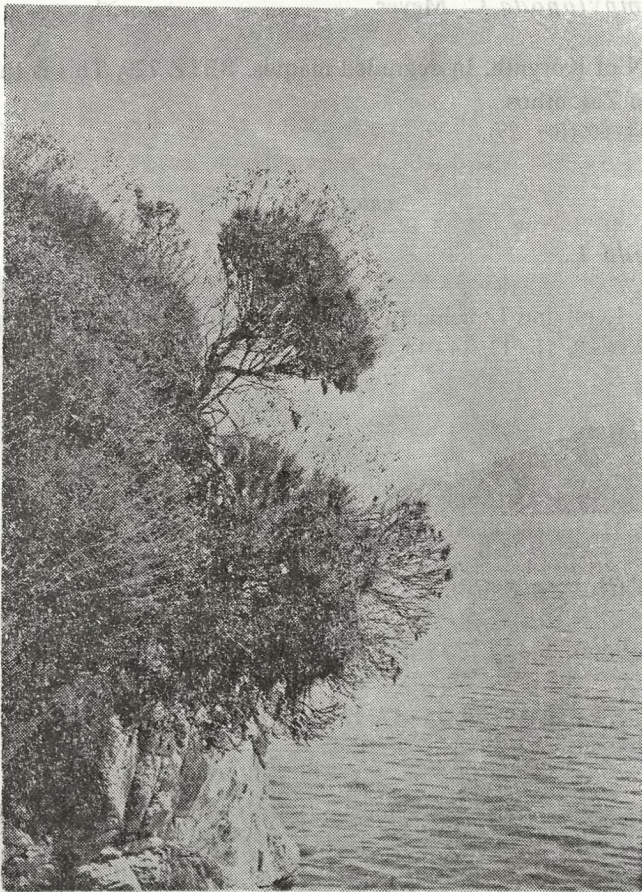


Fig. 5. *Ptilostemon chamaepeuce* at the Akr. Keri (phot. A. Bora-tyński)

CONVOLVULACEAE

Convolvulus oleifolius Desf.

Rocky sea shore W of Volimes. BBTZ 1119. This is the first record of this species from the island (Fig. 24)

CUPRESSACEAE

Juniperus phoenicea L.

Akr. Skinari N of Korynth. Stony calcareous slope by the sea. In maquis. BBTZ 735.

Field obs.: 1, 3, 10, 17, 42, 50, 61, 63, 70 (Fig. 25)

EPHEDRACEAE

Ephedra campylopoda C. Meyer

Akr. Skinari N of Korynth. In degraded maquis. BBTZ 729. This is the new species for the flora of Zakynthos.

Field obs.: 1, 44, 60 (Fig. 29)

ERICACEAE

Arbutus unedo L.

Between Agios Leon and Loucha. In degraded maquis. BBTZ 775.

Field obs.: 1 - 2, 8 - 9, 11 - 12, 14 - 18, 22, 26 - 28, 31 - 33, 40 - 43, 50 - 51, 57, 62, 64 - 65, 69 - 70 (Fig. 26)

Erica arborea L.

The route Katastari — Orthonies. Wayside maquis. BBTZ 710.

Field obs.: 8 - 9, 11, 13, 18, 40, 43, 60, 63 (Fig. 27).

Erica manipuliflora Salisb.

2 km W of Volimes. Stony sea shore slopes with degraded maquis and phrygana. BBTZ 756.

Field obs.: 1 - 2, 5, 9 - 10, 11 - 14, 15 - 17, 19 - 21, 24, 26, 29, 31, 33, 41 - 42, 44, 49 - 51, 57, 64 - 65 (Fig. 28).

EUPHORBIACEAE

Euphorbia dendroides L.

Kampi. Very rare on vertical sea shore rocks. BBTZ 761. (Fig. 30).

FAGACEAE

Quercus coccifera L.

Rocky sea shore near Ano Vassilikos E of Zakynthos. In maquis. BBTZ 798.

Field obs.: 1 - 8, 10 - 13, 16 - 18, 20, 22, 26 - 27, 31 - 34, 36, 38, 40 - 41, 43 - 44, 46, 51 - 52, 56 - 62, 64 - 65, 69 (Fig. 31)

Quercus ilex L.

Between Korynth and the cross-roads to Askos and Volimes. In maquis. BBTZ 723;

Between Loucha and Gyri. Wayside thickets. BBTZ 777.

Field obs.: 6, 10, 27, 70 (Fig. 32)

Quercus pubescens Willd.

Between Ano Gerakari and Alykes. BBTZ 701; Between Agios Leon and Loucha.

Wayside thickets. BBTZ 776. This is the new species for the flora of the island (Fig. 33).

Field obs.: 26.

GLOBULARIACEAE

Globularia alypum L.

Dry stony slope of Skopos Mt. SE of Xirokastello. In thickets. BBTZ 696; N of Koroni. Maquis and phrygana on calcareous slopes. BBTZ 707; Vrachionas Mt. W of Gyri. In phrygana. BBTZ 782.

Field obs.: 2, 6, 8 - 9, 11 - 16, 18 - 22, 26 - 33, 42 - 43, 49, 51, 63 - 64 (Fig. 34).



Fig. 6. *Hypericum aegypticum* community at the Akr. Skinari (phot. A. Boratyński)

GUTTIFERAE

Hypericum aegypticum L.

Akr. Skinari N of Korynth. Rocky calcareous slopes by the sea. BBTZ 730, 731, 732; Rocky sea shore and valleys W of Volimes. BBTZ 745, 750, 752; Rocky vertical valleys and sea shore maquis near Kampi. BBTZ 759, 760; Rocky sea shore SW of Agios Leon. BBTZ 762; Akr. Keri. Vertical cliffs by the sea. BBTZ 768; Rocky sea coast near Ano Vassilikos, E of Zakynthos, BBTZ 789. More informations in: Boratyński et al. (1990). (Fig. 6, 35)

Hypericum empetrifolium Willd.

Dry stony slope of Skopos Mt. SE of Xirokastello. In low thickets. BBTZ 691. Field obs.: 1 - 2, 5, 7 - 8, 10 - 22, 26 - 29, 31 - 33, 40 - 41, 43, 49 - 51, 58, 65 (Fig. 36)

LABIATAE

Coridothymus capitatus (L.) Reichb. f.

Akr. Skinari N of Korynth. In phrygana. Common. BBTZ 729 a. Field obs.: 1 - 2, 4 - 9, 11 - 22, 26 - 28, 30 - 32, 36, 38, 40 - 44, 49, 51, 55, 57 - 58, 60 - 65, 67, 69 - 70 (Fig. 37)

Lavandula stoechas L.

Ano Vassilikos E of Zakynthos. Clayey wayside in an olive orchard. BBTZ 791. (Fig. 38)

Micromeria graeca (L.) Benth. ex Reichb.

Stony hill in the massif of Skopos Mt., SE of Xirokastello. BBTZ 696; Ano Vassilikos E of Zakynthos. Rocky wayside. BBTZ 790.

Micromeria juliana (L.) Benth. ex Reichb.

Dry stony slope of Skopos Mt. SE of Xirokastello. In low thickets. BBTZ 691 a; N of Koroni. Edge of maquis by the road towards the sea. BBTZ 708; Between Korynth and the cross-road to Askos and Volimes. Edge of degraded maquis. BBTZ 725.

Micromeria nervosa (Desf.) Benth.

N of Koroni. Maquis on calcareous slopes. BBTZ 707.

Phlomis fruticosa L.

Between Korynth and the cross-roads to Askos and Volimes. BBTZ 721; Vrachionas Mt. NW of Gyri. In degraded maquis and phrygana. BBTZ 783.

Field obs.: 2, 4 - 7, 18 - 23, 26 - 27, 34 - 38, 40 - 41, 43 - 44, 46, 48, 51 - 52, 54, 58, 65, 67 - 69 (Fig. 39)

Prasium majus L.

Slopes of Skopos Mt. SE of Xirokastello. Among low thickets. BBTZ 695

Field obs.: 1, 3 - 6, 10, 12, 28, 30, 34, 51, 54, 57, 60 - 61, 63 - 65, 67 - 68 (Fig. 40)

Rosmarinus officinalis L.

Orthonies. Stony wayside. BBTZ 723; Between Volimes and Agios Georgios Monastery. In degraded maquis. BBTZ 755; Between Agalas and Akr. Kentinaria. In degraded maquis. BBTZ 764; Akr. Keri. Common in phrygana and degraded maquis. BBTZ 770.

Field obs.: 70 (Fig. 7, 41)

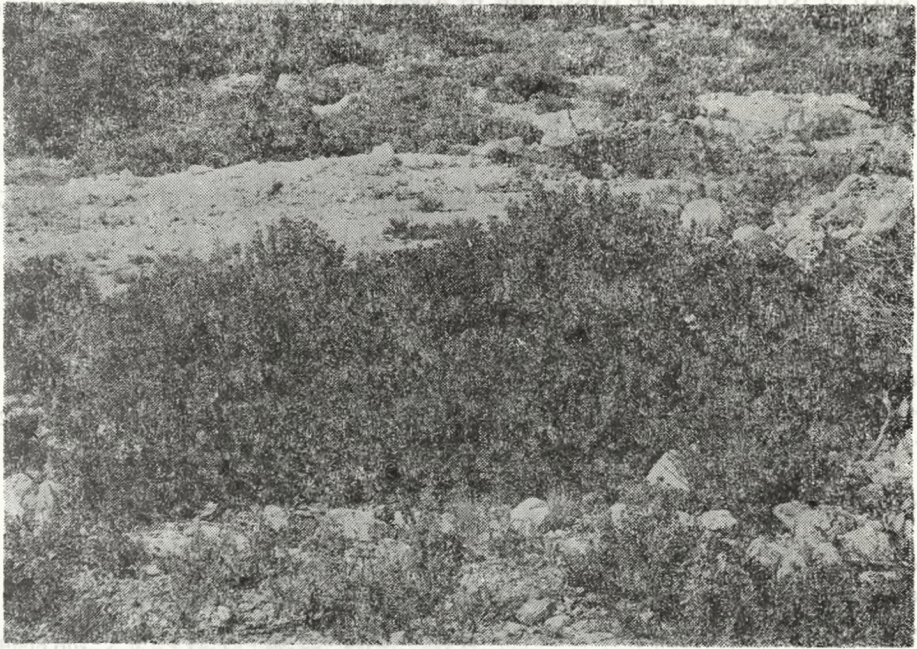


Fig. 7. *Rosmarinus officinalis* by the way from Agalas towards the Akr. Kentinaria (phot. A. Boratyński)

Salvia fruticosa Miller

S slopes of Skopos Mt. W of Gerakas. In degraded maquis. BBTZ 685; N of Koroni. Maquis on calacraeous slopes not far from the sea. BBTZ 707 a.

Field obs.: 3 - 5, 13, 17 - 18, 21 - 22, 26, 30, 33, 43 - 44, 50 - 51, 63, 67 - 70 (Fig. 42)

Satureja thymbra L.

S slopes of Skopos Mt. W of Gerakas. In phrygana. BBTZ 685 a; The route Kastastari - Orthonies. Edge of cultivated field not far from Orthonies. BBTZ 713.

Field obs.: 2, 11 - 20, 28 - 33, 40, 42, 50 - 51, 63 - 65 (Fig. 43)

LAURACEAE

Laurus nobilis L.

In maquis by the road from Volimes to Korynth, 2 km from Askos. Not far from the farm buildings. Native? BBTZ 738. This is the first record of this species from Zakynthos. (Fig. 44)

LEGUMINOSAE

Anagyris foetida L.

1 km S of Korynth, at the cross-roads to Askos and Volimes. Edge of an olive orchard, BBTZ 737; Ano Vassilikos. In maquis on the stony-clayey sea shore. BBTZ 793. (Fig. 45)

Anthyllis hermanniae L.

Between Korynth and the cross-roads to Askos and Volimes. Edge of maquis. BBTZ 719.

Field obs.: 1 - 2, 5 - 22, 26 - 32, 34, 36 - 37, 41 - 44, 49 - 52, 54, 57 - 58, 60 - 64, 69 - 70 (Fig. 46)

Calicotome villosa (Poiret) Link

Rocky sea shore near Ano Vassilikos, E of Zakynthos. In maquis. BBTZ 794.

Field obs.: 1 - 5, 7 - 8, 11 - 14, 17, 19, 21 - 23, 26, 28 - 30, 34, 36 - 38, 41, 43 - 44, 49, 51 - 52, 54, 57 - 58, 61 - 65, 67 - 70 (Fig. 47)

Ceratonia siliqua L.

Gerakas. Dry pastured meadow not far from the sea. BBTZ 676.

Field obs.: 2 - 7, 11 - 13, 18 - 19, 21 - 22, 26, 28 - 32, 34 - 35, 38, 40 - 44, 49, 51 - 52, 57, 62, 64, 69 - 70 (Fig. 48).

Coronilla emerus L. subsp. *emeroides* (Boiss. et Spruner) Hayek

Xirokastello. Clayey-stony slope by the road. In the thickets. BBTZ 687.

Field obs.: 4 - 5, 10, 26, 28 - 29, 35, 38 - 39, 41, 50, 56, 58, 65, 69 - 70 (Fig. 49)

Genista acanthoclada DC.

Field obs.: 38, 60, 63. This is the new species for the flora of Zakynthos. (Fig. 50)

Spartium junceum L.

Gerakas. Dry pastured meadow by the sea. BBTZ 679 a.

Field obs.: 1 - 6, 8, 11 - 12, 14, 16 - 18, 21, 25, 32, 34 - 36, 38 - 41, 43 - 44, 46, 48, 51 - 61, 63 - 65, 67, 70 (Fig. 51)

MALVACEAE

Lavatera bryoniifolia Miller

Xirokastello. Rare in wayside thickets. BBTZ 698. This is the first record of this species from Zakynthos. (Fig. 52)

MYRTACEAE

Myrtus communis L.

Alykes N of Katastari. Roadside maquis. BBTZ 757.

Field obs.: 1, 4, 10, 12 - 13, 15, 17, 19, 21, 23, 25 - 26, 32 - 39, 41 - 43, 50, 54, 56 - 57, 59 - 65 (Fig. 53)

OLEACEAE

Olea europaea L. var. *sylvestris* Brot.

Between Gyri and Kallithea. In degraded maquis. BBTZ 787.

Field obs.: 1, 6 - 13, 17, 22, 26 - 31, 41, 43 - 44, 49 - 51, 63 - 65, 70 (Fig. 54)

Phillyrea latifolia L.

S slopes of Skopos Mt. W of Gerakas. In degraded maquis. BBTZ 686; 2 km W of Volimes. Stony sea shore slopes with degraded maquis and phrygana. BBTZ 753; Ano Vassilikos E of Zakynthos. In maquis. BBTZ 792.

Field obs.: 1 - 7, 9 - 21, 26 - 31, 33, 41 - 44, 49, 57, 58 - 62, 64, 68 - 70 (Fig. 55)

PINACEAE

Pinus halepensis Miller

Field obs.: 2, 6, 8 - 11, 13 - 20, 22 - 24, 27 - 33, 40 - 41, 43 - 44, 48, 49, 51 - 52, 54, 60, 62, 64 - 65, 69 - 70 (Fig. 56)

RANUNCULACEAE

Clematis flammula L.

Xirokastello. Wayside thickets. BBTZ 697.

Field obs.: 16, 51, 53, 58, 67 (Fig. 57)

RHAMNACEAE

Rhamnus alaternus L.

W slopes of Skopos Mt. E of Kalamaki. In maquis by an olive orchard. BBTZ 800.

Field obs.: 14, 21, 44, 52, 57, 64 - 65 (Fig. 58)

Rhamnus oleoides L.

N of Koroni. Degraded maquis on calcareous slopes not far from the sea. BBTZ 708; Between Korynth and the cross-roads to Askos and Volimes. Edge of degraded maquis. BBTZ 727; Akr. Skinari N of Korynth. Stony calcareous slope. BBTZ 736; Between Gyri and Kallithea. Degraded maquis. BBTZ 788. This is the new species for the flora of Zakynthos.

Field obs.: 1, 3 - 4, 6, 12, 22, 26, 29 - 30, 44 - 51, 67, 68, 70 (Fig. 59)

ROSACEAE

Crataegus monogyna Jacq.

The route Katastari – Orthonies. Edge of cultivated field not far from Orthonies. Fruits with 2 styles! BBTZ 712. Between Orthonies and Volimes. Wayside thickets. BBTZ 714, 715; Wayside thickets between Agios Leon and Agios Nikolaos. BBTZ 763; Between Loucha and Gyri. Wayside thickets. BBTZ 778. This is the new species for the flora of Zakynthos.

Field obs.: 6, 13, 20, 22 - 23, 25 - 27, 41 (Fig. 60)

Prunus spinosa L. *subsp. dasyphylla* (Schur.) Domin

Just near the town of Zakynthos by the road to Kalamaki. Wayside thickets. BBTZ 700 (Fig. 61)

Pyrus spinosa Forsskal

Gerakas. Dry pastured meadows not far from the sea. BBTZ 677; Vrachionas Mt. NW of Gyri. On phrygana and degraded maquis. BBTZ 780.

Field obs.: 1 - 2, 5, 11, 13 - 15, 17 - 20, 22, 26 - 27, 30 - 35, 38, 40 - 41, 43 - 44, 48, 51 - 52, 54, 56 - 61, 64 - 65, 67, 69 - 70 (Fig. 62)

Rosa sempervirens L.

Xirokastello. Very common in wayside maquis. BBTZ 689; Porto Koukla E of Lithakia. In wayside thickets not far from the sea. BBTZ 774.

Field obs.: 7, 13, 16, 23, 35 - 39, 45 - 47, 52, 54, 56 - 57, 59 - 61, 66 - 67 (Fig. 63)

Rubus ulmifolius Schott

Limni Keriou N of Keri. Wayside thickets. BBTZ 772.

Field obs.: 1 - 2, 4 - 6, 9, 11, 13 - 19, 21 - 23, 25 - 26, 28, 32 - 36, 38 - 41, 44, 46 - 48, 51 - 57, 59 - 60, 62, 64 - 67, 69 - 70 (Fig. 64)

Sarcopoterium spinosum (L.) Spach

Vrachionas Mt. NW of Gyri. In phrygana. BBTZ 781.

Field obs.: 1 - 7, 9, 11 - 14, 16 - 22, 26 - 34, 40 - 44, 49, 51 - 52, 54 - 65, 67, 69 - 70 (Fig. 65)

RUBIACEAE

Putoria calabrica (L.f.) DC.

Xirokastello. Clayey slope by the road. Common. BBTZ 688; Slopes of Skopos Mt. SE of Xirokastello. Sunny places among low thickets. BBTZ 694.

Field obs.: 1 - 3, 5 - 10, 12 - 13, 15, 17 - 18, 20 - 22, 31 - 33, 40 - 41, 43 - 44, 51 - 52, 69 (Fig. 66)

Rubia tenuifolia D' Urv.

Gerakas. In thickets on dry pastured meadows, not far from the sea. BBTZ 678. (Fig. 67)

SANTALACEAE

Osyris alba L.

Between Korynth and the cross-roads to Askos and Volimes. Edge of degraded maquis. Browsed. BBTZ 722; Between Agalas and Keri. In wayside maquis. BBTZ 767.

Field obs.: 6, 12, 20, 26, 32 - 33, 41, 43 - 44, 46, 51, 58, 60, 65 (Fig. 68)

SMILACACEAE

Smilax aspera L.

Rocky sea shore near Ano Vassilikos E of Zakynthos. In maquis. BBTZ 797; 799.

Field obs.: 1 - 5, 9 - 10, 13 - 18, 21 - 22, 26 - 30, 32 - 35, 37 - 39, 41 - 44, 46, 52 - 54, 56 - 57, 59, 61 - 64, 66 - 67, 69 (Fig. 69)

SOLANACEAE

Lycium europaeum L.

Just near the town of Zakynthos by the road to Kalamaki. Wayside thickets. BBTZ 699. (Fig. 70)

TAMARICACEAE

Tamarix hampeana Boiss. et Heldr.

According to Bornmüller (1928) and Baum (1978)

THYMELAEACEAE

Thymelaea tartonraira (L.) All.

Degraded maquis and phrygana SW of Anafonitria, by the way towards the sea. BBTZ 742, 743, 745. This is the new species for the flora of the island.

Field obs.: 14, 16 - 17 (Fig. 71)

ULMACEAE

Ulmus minor Miller subsp. *canescens* (Melville) Browicz et Ziel.

Between Ano Gerakari and Alykes. Wayside thickets. BBTZ 702; Porto Koukla E of Lithakia. In thickets not far from the sea. BBTZ 773 (Fig. 72)

VERBENACEAE

Vitex agnus-castus L.

Between Agios Kirikos and Langadakia (near Gulara). Wayside thickets by an olive orchard. BBTZ 784.

Field obs.: 35, 38 - 39, 47, 52, 54, 57, 59 - 61, 65 (Fig. 73)

SUMMARY

From May 21st to 30th of 1988 floristic investigations were conducted on Zakinthos, the southernmost island of the Ionian Sea. The main purpose of this work was to compile a full list of trees and shrubs occurring on the island in the wild state and to prepare point maps of distribution of these species on the island. For comparison use was made of K. Ronniger's „Flora der Insel Zante” published in 1941 in which the author presented information about the occurrence of 804 species of plants living there, including those that escaped from cultivation and some of the cultivated ones.

As a result of a detailed penetration of the island, collection of rich herbarium material and the compilation of floristic lists for 70 stands in various parts of the island, it turned out that presently there grow 72 species of wild trees and shrubs, of which 15 are new species not mentioned by Ronniger, namely: *Arthrocnemum perenne*, *Convolvulus oleifolius*, *Dianthus fruticosus* subsp. *occidentalis*, *Cistus parviflorus*, *Cotinus coggygria*, *Crataegus monogyna*, *Ephedra campylopoda*, *Genista acanthoclada*, *Helianthemum syriacum*, *Laurus nobilis*, *Lavatera bryoniifolia*, *Pistacia terebinthus*, *Quercus pubescens*, *Rhamnus oleoides* and *Thymelaea tartonraira*. Four species mentioned by Ronniger have not been found, namely: *Pinus pinea*, *Sambucus nigra*, *Celtis australis* and *Cytisus villosus* (= *C. triflorus*).

The authors list all the species of wild trees and shrubs found on the island in an alphabetic order within families and genera, and next to each species they cite their own herbarium collections and the numbers of the successive floristic lists in which the given species has been included. Besides they present point maps of distribution for all species except for those of genera *Micromeria*, *Fumana* and *Tamarix*. The herbarium collections from Zakinthos are held in the herbarium of the Institute of Dendrology in Kórnik and in the herbarium of the Museum of Natural History in Kifissia, Greece.



Fig. 8. *Cotinus coggygria* Scop.

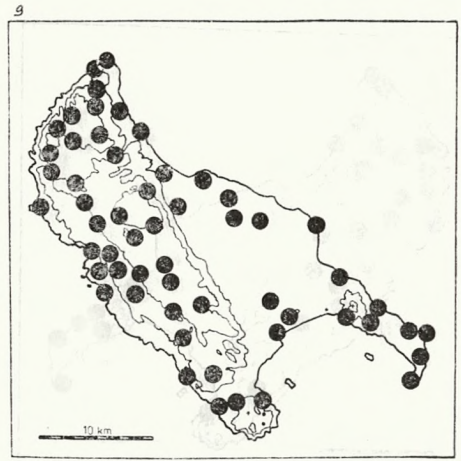


Fig. 9. *Pistacia lentiscus* L.

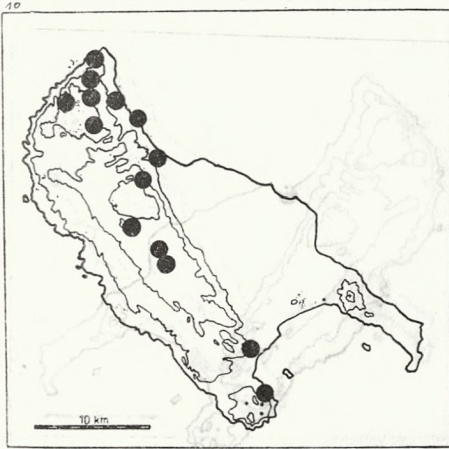


Fig. 10. *Pistacia terebinthus* L.



Fig. 11. *Nerium oleander* L.



Fig. 12. *Hedera helix* L.



Fig. 13. *Capparis spinosa* L.

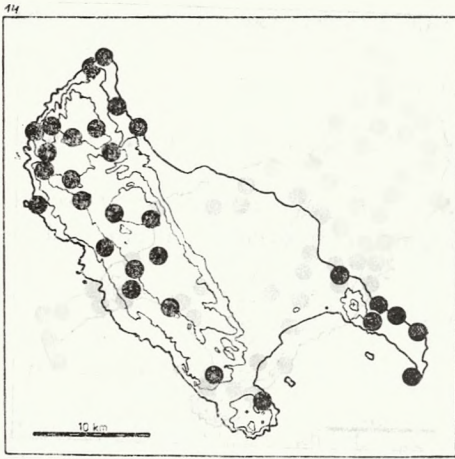


Fig. 14. *Lonicera implexa* Aiton



Fig. 15. *Dianthus fruticosus* L. subsp. *occidentalis* Runemark



Fig. 16. *Arthrocnemum fruticosum* (L.) Moq.



Fig. 17. *Arthrocnemum perenne* (Miller) Moss



Fig. 18. *Halimione portulacoides* (L.) Aellen

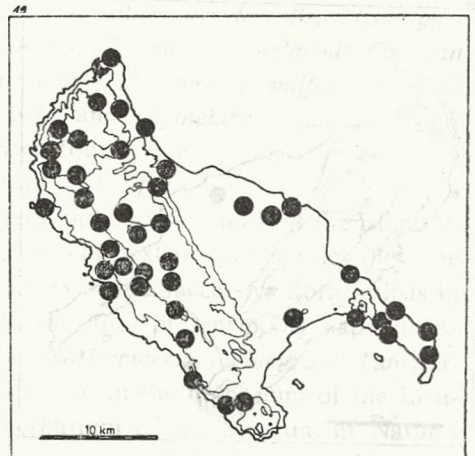


Fig. 19. *Cistus incanus* L.



Fig. 20. *Cistus parviflorus* Lam.

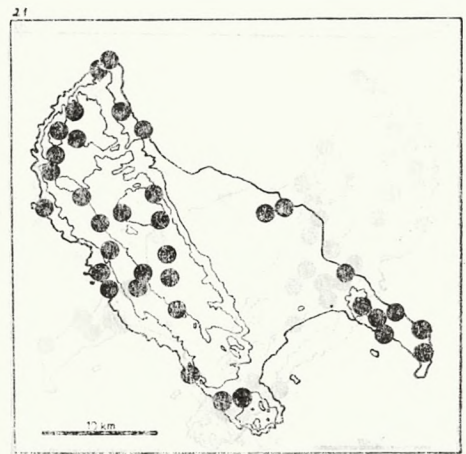


Fig. 21. *Cistus salvifolius* L.



Fig. 22. *Helianthemum syriacum* (Jacq.) Dum.-
-Cours.

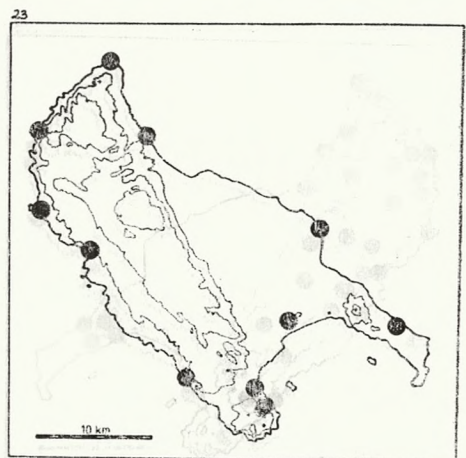


Fig. 23. *Ptilostemon chamaepeuce* (L.) Less.



Fig. 24. *Convolvulus oleifolius* Desf.



Fig. 25. *Juniperus phoenicea* L.

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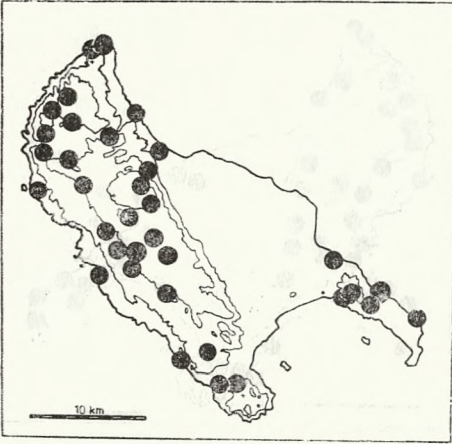


Fig. 26. *Arbutus unedo* L.

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Fig. 27. *Erica arborea* L.

28

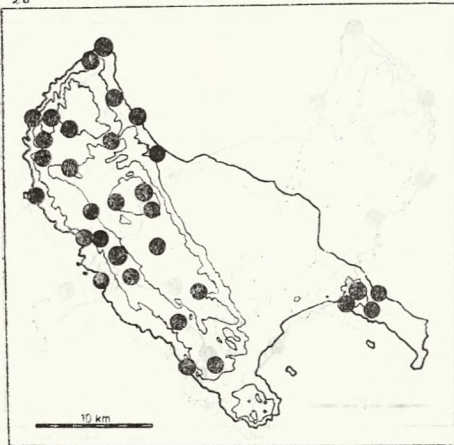


Fig. 28. *Erica manipuiflora* Salisb.

29



Fig. 29. *Ephedra campylopoda* C. Meyer

30



Fig. 30. *Euphorbia dendroides* L.

31



Fig. 31. *Quercus coccifera* L.

32



Fig. 32. *Quercus ilex* L.

33

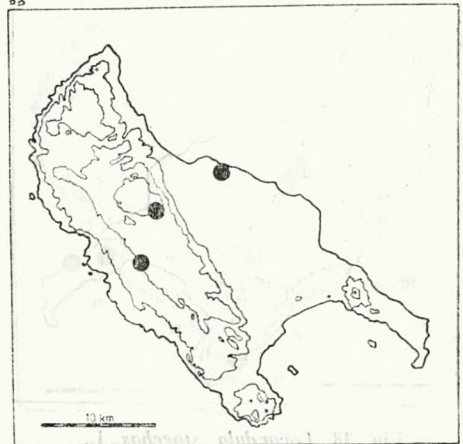


Fig. 33. *Quercus pubescens* Willd.

34



Fig. 34. *Globularia alypum* L.

35

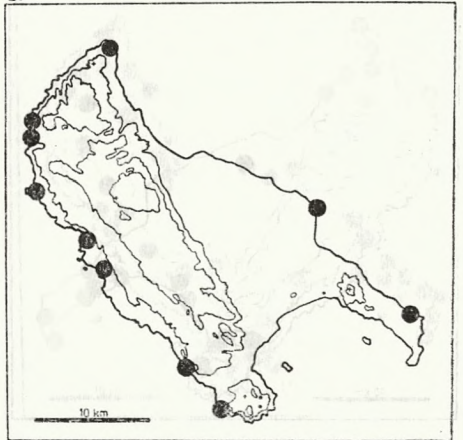


Fig. 35. *Hypericum aegypticum* L.

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Fig. 36. *Hypericum empetrifolium* Willd.

37

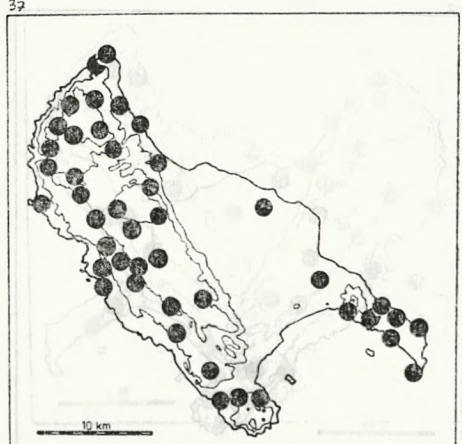


Fig. 37. *Coridothymus capitatus* (L.) Reichenb. f.



Fig. 38. *Lavandula stoechas* L.



Fig. 39. *Phlomis fruticosa* L.



Fig. 40. *Prasium majus* L.

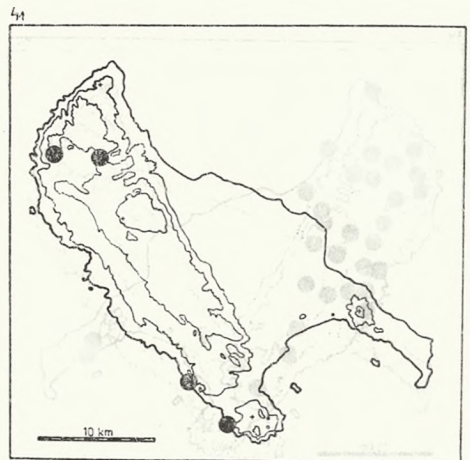


Fig. 41. *Rosmarinus officinalis* L.



Fig. 42. *Salvia fruticosa* Miller

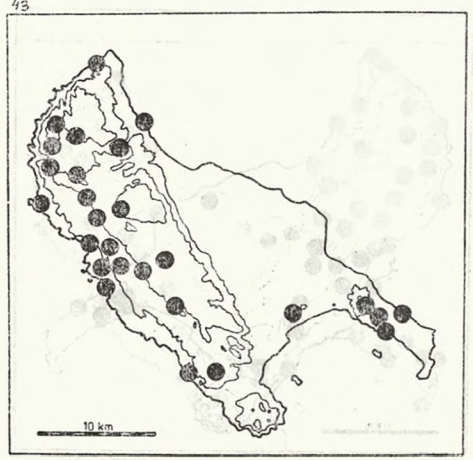


Fig. 43. *Satureja thymbra* L.

44

Fig. 44. *Laurus nobilis* L.

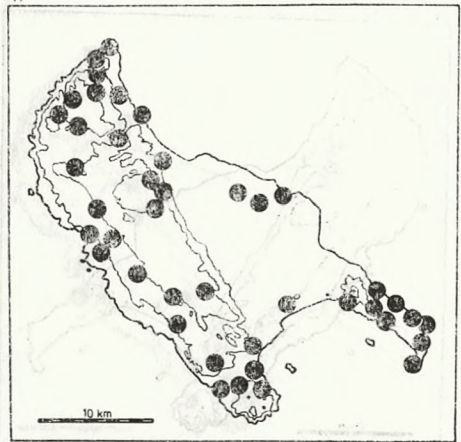
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Fig. 45. *Anagyris foetida* L.

46

Fig. 46. *Anthyllis hermanniae* L.

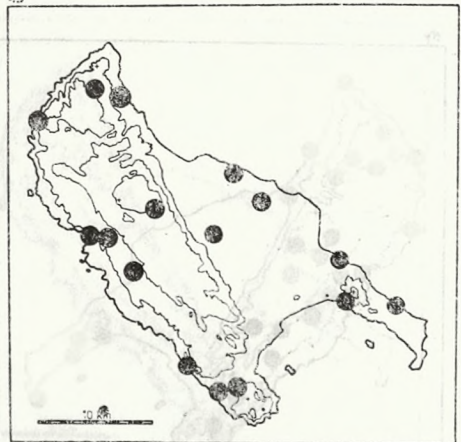
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Fig. 47. *Calicotome villosa* (Poiret) Link

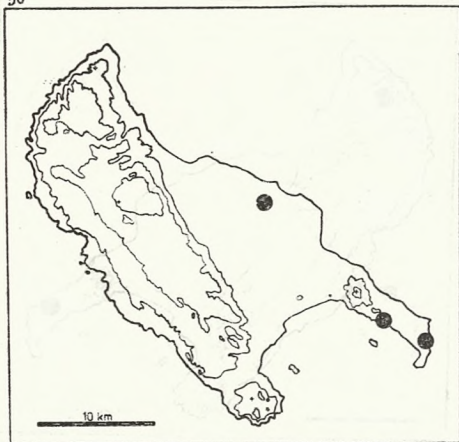
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Fig. 48. *Ceratonia siliqua* L.

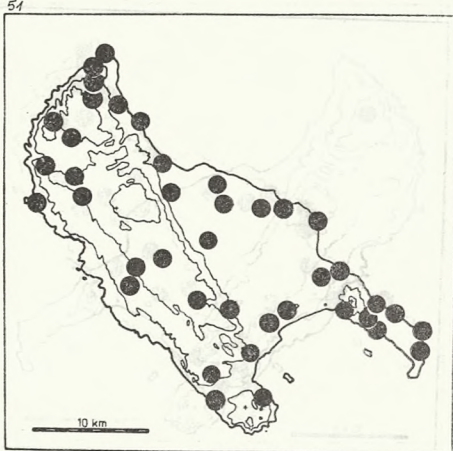
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Fig. 49. *Coronilla emerus* L. subsp. *emeroides*
(Boiss. et Spruner) Hayek

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Fig. 50. *Genista acanthoclada* DC.

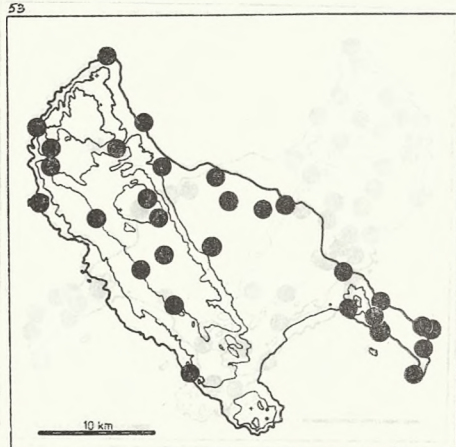
51

Fig. 51. *Spartium junceum* L.

52

Fig. 52. *Lavatera bryoniifolia* Miler

53

Fig. 53. *Myrtus communis* L.

54

Fig. 54. *Olea europaea* L. var. *syvestris* Brot.

55

Fig. 55. *Phillyrea latifolia* L.



Fig. 56. *Pinus halepensis* Miller

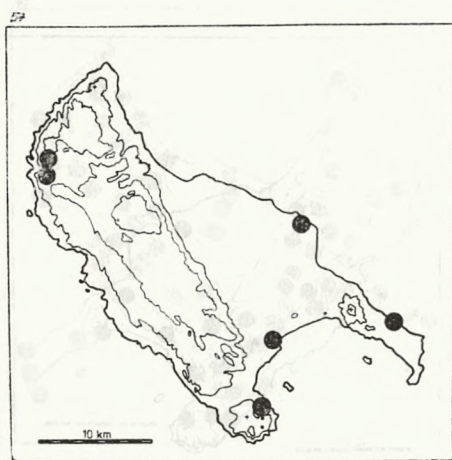


Fig. 57. *Clematis flammula* L.



Fig. 58. *Rhamnus alaternus* L.



Fig. 59. *Rhamnus oleoides* L.

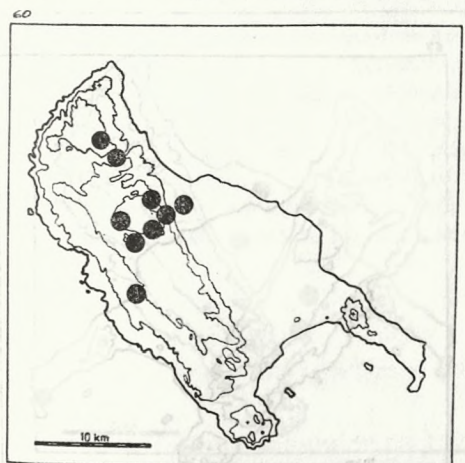


Fig. 60. *Crataegus monogyna* Jacq.

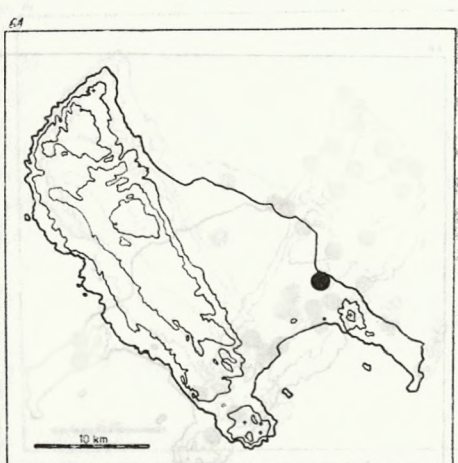


Fig. 61. *Prunus spinosa* L. subsp. *dasyphylla* (Schur) Domin



Fig. 62. *Pyrus spinosa* Forsskal



Fig. 63. *Rosa sempervirens* L.



Fig. 64. *Rubus ulmifolius* Schott



Fig. 65. *Sarcopoterium spinosum* (L.) Spach



Fig. 66. *Putoria calabrica* (L.f.) DC.



Fig. 67. *Rubia tenuifolia* D'Urv.

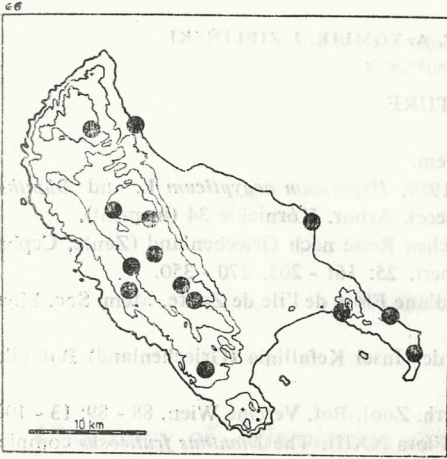


Fig. 68. *Osyris alba* L.

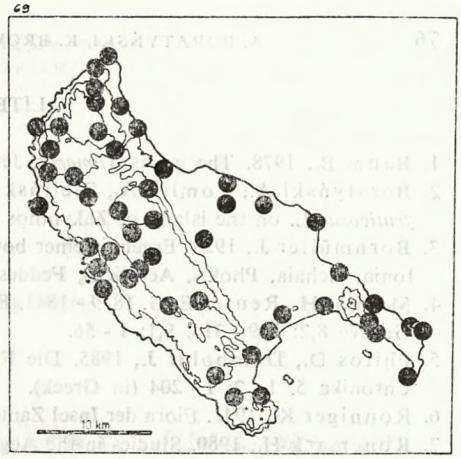


Fig. 69. *Smilax aspera* L.

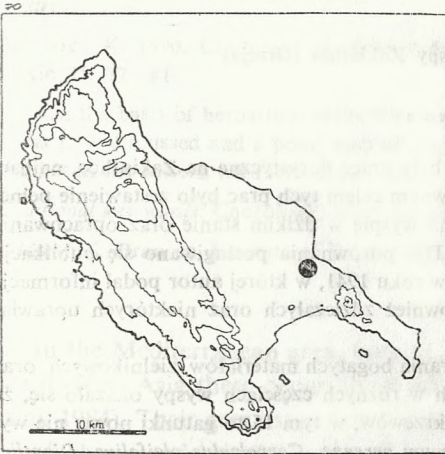


Fig. 70. *Lycium europaeum* L.

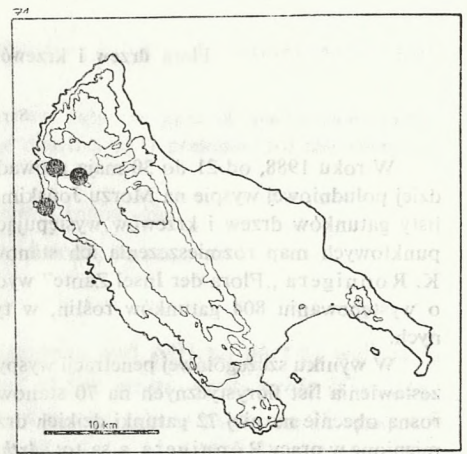


Fig. 71. *Thymelaea tartonraira* (L.) All.

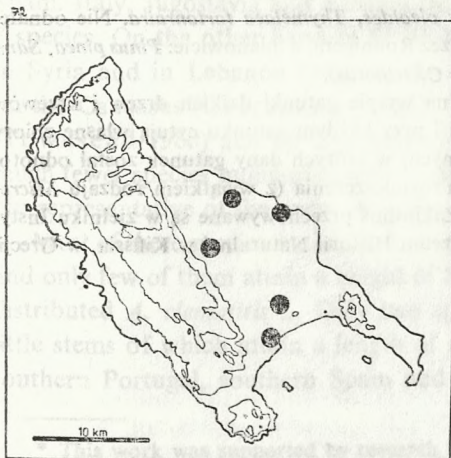


Fig. 72. *Ulmus minor* Miller subsp. *canescens* (Melville) Browicz et Ziel.

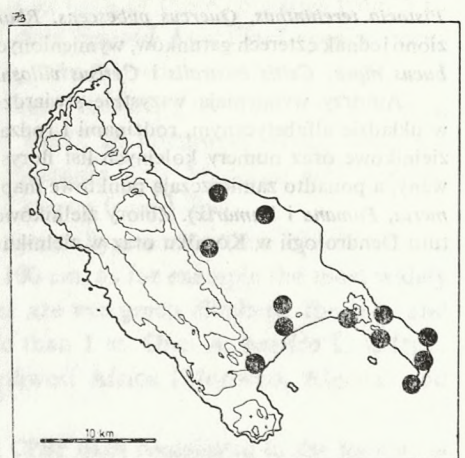


Fig. 73. *Vitex agnus-castus* L.

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Flora drzew i krzewów wyspy Zakynthos (Grecja)

Streszczenie

W roku 1988, od 21 do 30 maja prowadzone były prace florystyczne na Zakynthos, najbardziej południowej wyspie na Morzu Jońskim. Głównym celem tych prac było zestawienie pełnej listy gatunków drzew i krzewów występujących na wyspie w dzikim stanie oraz opracowanie punktowych map rozmieszczenia ich stanowisk. Dla porównania posługiwano się publikacją K. Ronnigera „Flora der Insel Zante” wydanej w roku 1941, w której autor podał informacje o występowaniu 804 gatunków roślin, w tym również zdziczałych oraz niektórych uprawianych.

W wyniku szczegółowej penetracji wyspy, zebrania bogatych materiałów zielnikowych oraz zestawienia list florystycznych na 70 stanowiskach w różnych częściach wyspy okazało się, że rosną obecnie na niej 72 gatunki dzikich drzew i krzewów, w tym 15 to gatunki nowe, nie wymienione w pracy Ronnigera, a są to: *Arthrocnemum perenne*, *Convolvulus oleifolius*, *Dianthus fruticosus* subsp. *occidentalis*, *Cistus parviflorus*, *Cotinus coggygria*, *Crataegus monogyna*, *Ephedra campylopoda*, *Genista acanthoclada*, *Helianthemum syriacum*, *Laurus nobilis*, *Lavatera bryoniifolia*, *Pistacia terebinthus*, *Quercus pubescens*, *Rhamnus oleoides*, *Thymelaea tartonraira*. Nie odnaleziono jednak czterech gatunków, wymienionych przez Ronnigera, a mianowicie: *Pinus pinea*, *Sambucus nigra*, *Celtis australis* i *Cytisus villosus* (= *C. triflorus*).

Autorzy wymieniają wszystkie stwierdzone na wyspie gatunki dzikich drzew i krzewów w układzie alfabetycznym, rodzinami i rodzajami i przy każdym gatunku cytują własne zbiory zielnikowe oraz numery kolejnych list florystycznych, w których dany gatunek został odnotowany, a ponadto zamieszczają punktowe mapy ich rozmieszczenia (z wyjątkiem rodzaju *Micromeria*, *Fumana* i *Tamarix*). Zbiory zielnikowe z Zakynthos przechowywane są w zielniku Instytutu Dendrologii w Kórniku oraz w zielniku Muzeum Historii Naturalnej w Kifissia, w Grecji.