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Woody flora of Chios*

Abstract

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From May 11th to June 2nd 1985 floristic dendrological field studies were conducted on Chios island. The woody flora of Chios has 108 species, 32 of which are new taxons for the island, first reported by the authors. All the species were characterized as regards their mode of occurrence and point maps of their distribution on Chios were prepared.

Additional key words: Chorology, trees, shrubs, Greece.

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INTRODUCTION

Chios is the 5th Greek island in order of size, being preceded only by Crete, Euboea, Lesbos and Rodhos. Its area covers 807 km². The island is located in the central part of the Aegean Sea near the western shores of Anatolia, parallel with the Çesme peninsula from which it is separated by a narrow straight, only 8 km wide in the narrowest place. North of Chios there lies Lesbos and south of it Ikaria, northwest Psara and Antipsara and northeast, in the straight, a small lowland island Inussae. The maximum length of the island, in a straight line from north to south, from cape Kambi to cape Masticho, is 52 km and the maximum breadth, in the northern part of the island is about 29 km. The greatest breadth in the south is 22 km and the smallest breadth in the central part of the island is only 13 km. The north and central part of the island are mountainous, and four peaks exceed 1000 m. Tallest is the two-peaked Pelinaion Mt. (Fig. 1), the northern peak Profitis Ilias is 1297 m

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Fig. 1. Top of Pelinaion Mt. — view from southern part of the ridge. Phot. A. Boratyński

and southern peak Koilia 1240 m. The further south one goes the lower are the mountains and in the extreme south the region is only hilly with peaks not exceeding 350 m (Trachomas has 347 m). In the north limestone rocks predominate and in the south tertiary sandstones.

While the island has been visited many times already in the XVII c. the botanical observations of first travellers concerned only cultivated plants, particularly fruit trees. They mention also the plantations of mastic-trees in the south of the island and the production of mastic. According to Meikle (1954) the first, truly floristic data we owe to J. Pitton de Tournefort who visited Chios in March 1701, during his excursion to several countries of the Levant. Some of the species found here Tournefort mentions in his *Corollarium Institutionem Rei Herbariae* (1703). More or less 90 years later, from February to May 1794 G. A. Olivier and J. G. Bruguière were on the island and they have collected several new plants for the flora of this island, however, they have not published anything on the subject. Similar was the case with the collections of Aucher-Eloy made in 1836. Materials of these collectors have been studied by other botanists in later time. Important for the knowledge of the flora of Chios was the visit of Th. v. Heldreich in 1846, and of the Professor of Botany from the University in Athens, Th. G. Orphanides, in the year 1856. Their collections have been made use of by Boissier in his *Flora Orientalis* (1867 - 1884). Besides in middle XIX c also F. W. Pauli was

collecting plants on Chios and the species he found were mentioned by Haussknecht in his *Symmbolae ad floram graecam* (1893 - 1899).

The XX c. also did not provide much floristic data on Chios since the island has been rather rarely visited by botanists. Thus for example J. Renz was here twice, in May 1928 and in May 1931, studying the orchids of Chios. Then in May 1934 K. H. Reching er was collecting herbarium materials on Chios, and in spite of the fact that he stayed on the island for only a few days his collections belong to some of the most important ones. Ten years later, in his classical work *Flora Aegaea* Reching er (1943) collected all data about plants occurring on Chios based on the available herbarium collections, including his own, and he compiled all the relevant literature, so that till the middle of XX c. this was the most important source of information about the flora of the island.

The second significant herbarium material from Chios has been collected in the years 1939 - 1940 by J. W. O. Platt. However, Reching er was not able to use this since the publication of these materials come much later. This was done by Meikle (1954), who in a special publication devoted to the flora of Chios cites Platt's herbarium specimens which are now stored in the herbarium of the Royal Botanic Garden at Kew. Meikle includes also the information that was presented in *Flora Aegaea*. This is the only conspect of the flora of Chios till this



Fig. 2. Group of *Quercus pubescens* trees among fields between Agion Gala and Melanios, ca 450 m alt. Phot A. Boratvński

day. According to Meikle (*l.c.*) in mid XX c. 693 species and varieties of vascular plants were known from Chios. This number is not final since our collections of trees and shrubs and field observations require that this conspect be extended to include a whole list of new species, including herbaceous ones. Chios still awaits a detailed study of its flora. In recent years herbarium materials were collected on Chios by E. Stamatidou in 1969, for the Goulandris Natural History Museum in Kifissia. Some data can also be found in the 9 volume publication Flora of Turkey (Davis 1965 - 1985). A few years ago a detailed study on the orchids of Chios was published, giving the range of distribution of the species in the form of point maps prepared by the method of squares (Gölz, Reinhard 1981).

As regards the vegetation of Chios this has been described, though in very general terms by Rauh (1949), who visited several northern islands of Greece in 1942, including Chios. He gives a short characteristic of several plant communities on the island and lists the characteristic species for them. In these lists it is possible to find species that were not mentioned by Rechingner (1943) nor by Meikle (1954) as for example *Juniperus phoenicea* L., and also some which were erroneously diagnosed (e.g. *Erinacea anthyllis* Link).

OUR OWN INVESTIGATIONS

In the year 1985 a dendrological expedition of three people was organized to visit Chios by the Institute of Dendrology of the Polish Academy of Sciences in Kórnik in cooperation with the Goulandris Natural History Museum, Kifissia. We were on the island for 23 days, from May 11th to June 2nd. It was our aim to describe the woody flora of the island, both in terms of the specific composition and in geographic distribution of individual taxa. On the one hand we tried to verify to occurrence of plants mentioned in the conspect of Meikle, and on the other to find new species, so far not reported from the island. Of the species of trees and shrubs mentioned by Meikle (1954) we were unable to locate four, namely *Helianthemum lavandulifolium* Miller, *Fumana procumbens* (Dunal) Gren. et Godron, *Clematis flammula* L. and *Astragalus ptilodes* Boiss. Besides it was necessary to clarify the presence on the island of certain species considered doubtful, such as *Acer monspessulanum* L., *Prunus spinosa* L., *Populus alba* L. and *Viburnum tinus* L. The latter two species do not grow wild on the island, and the herbarium specimens of Platt (without information on labels about location of collection site) were most probably collected from cultivated individuals, most likely from Chios town itself.

The penetration of the region, from the sea shore to the peak of the highest mountain was done from seven consecutively established camps,

namely at Marmaron (twice), Agion Gala, Volissos, Pirgi, Kambia and Chios, using also the local bus communication. The routes we took are shown on the map enclosed (Fig. 18). Obviously in spite of very intensive search we were unable to reach all places on the island, however, we suspect that the penetration of the region was so large that, it is possible to claim that the list of trees, shrubs and shrublets given below is a full one. It includes 32 new species for the flora of the island, namely: *Ame-lanchier parviflora* Boiss., *Arbutus andrachne* L., *Astragalus parnassi* Boiss., *Atriplex halimus* L., *Celtis australis* L., *Convolvulus oleifolius* Desf., *Cupressus sempervirens* L. f. *horizontalis* (Miller) Voss, *Euphorbia acanthothamnus* Held. et Sart., *Genista anatolica* Boiss., *Globularia alypum* L., *Gomphocarpus fruticosus* (L.) Ait., *Halimione portulacoides* (L.) Aellen, *Laurus nobilis* L., *Lonicera implexa* Aiton, *Lycium europaeum* L., *Medicago arborea* L., *Micromeria graeca* (L.) Bentham, *Phlomis cretica* C. Presl., *Pinus brutia* Ten var. *pyramidalis* Selik (a new taxon for the flora of Greece), *Pinus pinea* L., *Polygonum icaricum* Rech. f., *Prunus coccomilia* Ten, *Quercus infectoria* Olivier, *Ribes orientale* Desf., *Rosa agrestis* Savi, *Rosa phoenicia* Boiss., *Ruscus aculeatus* L., *Suaeda vera* J. F. Gmelin, *Tamarix parviflora* DC., *Tamarix smyrnensis* Bunge, *Teucrium brevifolium* Schreber and *Vitis sylvestris* C. C. Gmelin. The presence of some of these species on Chios is very interesting from the point of view of plant chorology (Boratyński, Zieliński, in print). Besides we have discovered several new herbaceous plants for the flora of Chios, including five ferns (Zieliński, 1987).

Below we give a description of the most characteristic communities of woody plants on Chios and we give in alphabetic order (by families and genera) the list of species and shrubs growing on the island. For each species we cite our own herbarium specimens with the abbreviation BBZ and a consecutive number, or else when the specimen was not collected, our own field observations. In the list also small shrublets are included from the genera *Fumana* (Dunal) Spach, *Helianthemum* Miller and *Micromeria* Bentham. For each taxon we found we have provided a point map of distribution based on the herbarium specimens, field observations and literature. The herbarium materials are housed in the Herbarium of the Institute of Dendrology in Kórnik and in the Goulandries Natural History Museum in Kifissia near Athens.

A GENERAL CHARACTERISTIC OF THE WOODY FLORA

The flora of Chios has not been so far the subject of phytosociological studies. Only small descriptions of some basic vegetation types are given by R a u h (1949) with notes on the differentiation dependent on the type of rock formations. It is assumed that the island lies completely in



Fig. 3. Group of *Acer sempervirens* trees among pastures and waste lands on the northern slopes of Pelinaion Mt. above Vikion, ca 800-850 m alt. Phot. A. Boratyński

the zone of evergreen leathery-leaved forests and thickets of Mediterranean character (Horvat et al. 1974), however, as we were able to see for ourselves, in the highest parts of the mountains high-alpine communities developed.

The natural vegetation underwent substantial transformations. Flat regions, suitable for cultivation have been transformed into fields and orchards many many years ago and in regions unsuitable for cultivation over the ages the grazing of goats and sheep has been practiced. The communities of presently existing woody plants, depending on the local site conditions and degree of transformation constitute a forest, a maquis or a phrygana. Only very small areas are covered by communities which cannot be included in one of these three basic formations. They include primarily thickets of low shrubs occurring on mountain tops, developing above 1000-1100 m elevation and also some coastal communities or vegetation on limestone cliffs characterized by certain specific features over small fragmentary areas.

FORESTS

The main forest forming species of Chios is *Pinus brutia* Ten. Pine forests still cover substantial portions of the surface area of the island, while forests of other type, known from only a few places are developed only fragmentarily.



Fig. 4. An old specimen of *Prunus cocomilia* about 7-8 m high; northern slopes of Pelinaion Mt. above Vikion, ca 800 m alt. Phot. A. Boratyński

Pine forests occur most commonly in the central and northern part of Chios, on mountain slopes and on elevations up to 700-800 m. They are more or less compact and underneath them in the majority of cases there grow loose low thickets of the phrygana type. The basic role is played among them by *Sarcopoterium spinosum* (L.) Spach, *Coridothymus capitatus* (L.) Reichenb. f., *Cistus incanus* L. and *C. salvifolius* L., and in places also *Hypericum empetrifolium* Willd., *Erica manipuliflora* Salisb. and *Genista acanthoclada* DC. In such forests, and particularly on their edges there appear occasionally *Adenocarpus complicatus* (L.) Gray and *Genista anatolica* Boiss.

Relatively rarely and usually in lower elevations does one find pine forests with a dense understorey of a maquis type. Within them there usually grow *Arbutus unedo* L., *Myrtus communis* L., *Pistacia lentiscus* L., *Rhamnus alaternus* L., *Quercus coccifera* L., *Ceratonia siliqua* L., and also *Lonicera etrusca* Santi and *Smilax aspera* L. Fragments of such

rich pine forests occur usually in slope depressions or near periodic water runs. We have observed them for example in the vicinity of Vikion, Amades or between Armolia and Vessa. Pine forests are frequently ravaged by fires, as happened in recent years in the north-western part of the island. When they occur they damage the vegetation over very large areas.

Residual oak and oak-maple forests. Numerous lone standing old specimens of *Quercus coccifera* L. and *Quercus pubescens* Willd. (Fig. 2) suggest that these species must have once formed larger patches of forest vegetation. Groups of trees and locally even small woods of *Quercus pubescens* Willd. we observed in the northwestern part of the island, near Melanios, Kourounia, Chalandra, Afrodisia, Volissos and Amades. Similar groups of remnant *Quercus coccifera* L. grow in the vicinity of Vikion and Kampia.

Above 400 - 500 m elevation, in the massif of the Pelinaion and Oros Mts. with single trees of *Quercus coccifera* L. there occur commonly *Acer sempervirens* L. (Fig. 3) and in places also *Prunus cocomilia* Ten. (Fig. 4). Fragments of such forests develop here and there all the way to an elevation of 1000 - 1100 m. They have no doubt occupied larger mountain areas, however, they were destroyed as a consequence of grazing or perhaps even felling, so that presently they are most frequently forests park-like in nature, or even only single large trees among thickets and pastures.

Woody flora near streams represents on Chios a peculiar characteristic feature of the landscape in the northern part of the island. It extends along periodic water runs or in their valleys almost from the sea level to an elevation of 600 - 700 m. The tree layer is composed exclusively of *Platanus orientalis* L. Directly under the plane trees there are usually no shrubs but in the vicinity of trees and in gaps between them there is luxuriant growth of *Nerium oleander* L., *Vitex agnus-castus* L., *Myrtus communis* L., *Rubus ulmoides* Schott sometimes *Rhamnus alaternus* L., *Rosa sempervirens* L., and *Laurus nobilis* L. and sporadically also *Cercis siliquastrum* L. and *Hedera helix* L. In many instances such sites have been taken over for cultivation, usually of gardens or orchards. Presently in some places one can observe the penetration of fragments of natural vegetation into the cultivated one as for example in the vicinity of Kampia, Giosonas, Kardamila and Chalandra.

A unique woody community is formed by *Cupressus sempervirens* L. f. *horizontalis* (Miller) Voss in the vicinity of Giosonas on the northeastern coast of the island. Fragments of a scattered, open cypress forest park-like in nature developed about 1 - 2 km west of the village, on the southeastern limestone rocky slopes in the valley of the Dipotamos stream, at an elevation of 200 - 400 m (Fig. 5). Cypress grows here together with *Acer sempervirens* L., *Phillyrea latifolia* L., *Pistacia tere-*



Fig 5. Locality of *Cupressus sempervirens* f. *horizontalis* on the southern, rocky slopes of Dipotamos valley above Giosnas, ca 350 m alt. Phot. A. Boratyński

binthus L., *Quercus coccifera* L. and *Pyrus spinosa* Forsskal and in the layer of shrubs there occurs *Salvia fruticosa* Miller. *Cupressus sempervirens* L. f. *horizontalis* (Miller) Voss has not been reported from Chios so far. A large number of old specimens growing in the stand described above, and also the wildness and inaccessibility of the place, leads us to believe that this form of cypress is a natural component of the island's flora.

MAQUIS

On Chios maquis is preserved as a rule in an impoverished form. This is associated on the one hand with a relatively rare occurrence of its components and on the other with the considerable transformations of the vegetation. Somewhat larger patches of evergreen thickets with

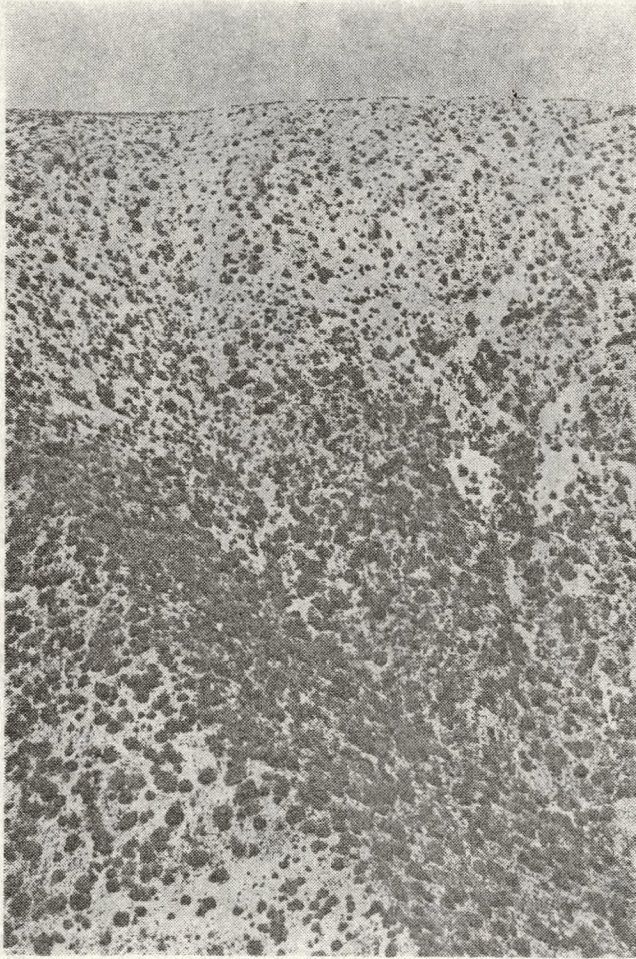


Fig. 6. Loose thickets of *Juniperus phoenicea* on the southern slopes of Amithountas valley in the Oros Mts., above Kardamila, from ca 400 m up to 800 m alt. Phot. A. Boratyński

coriaceous leaves have been observed in the southern part of the island e.g. in the vicinity of Pyrgi, Mesta, Elata and Emporio. They were most commonly composed of *Arbutus unedo* L. and the rarely occurring *A. andrachne* L., *Ceratonia siliqua* L., *Pistacia lentiscus* L., *Quercus coccifera* L., *Rhamnus alaternus* L., *Phillyrea latifolia* L. and sometimes also *Juniperus phoenicea* L., *Calicotome villosa* (Poiret) Link and *Spartium junceum* L. with the climbers *Smilax aspera* L., *Clematis cirrhosa* L. and *Lonicera etrusca* Santi. Sporadically in such thickets there grow such trees as *Pinus brutia* Ten. and *Quercus pubescens* Willk. More rich maquis communities have been taken over by field crops, olive plantations and the very widely cultivated in the southern part of the island plantations of *Pistacia lentiscus* L. cv. *Chia*.

A specific form of maquis on Chios consists of dense, 3-4 m tall thickets of *Spartium junceum* L., which are particularly frequent in the northern montane part of the island. They usually develop in the contact zone of a *Pinus brutia* Ten. forest with cultivated fields or a phrygana, or else on rock rubble or very shallow soil not uncommonly forming strips several dozen meters wide, particularly easy to spot during flowering. Such thickets we have observed in the vicinity of Kardamila, Amades, Vikion, Agion Gala and Melanios.

Also associated with maquis are loose thickets of *Juaiperus phoenicea* L., observed by us in the massif of the Oros Mts. at an elevation of 300 - 800 m (Fig. 6).

In the northern part of the island thickets of maquis type are rather rare. Small patches of such communities surrounded by phrygana, in which *Erica arborea* L. sometimes occurred, we have observed in the vicinity of Vikion and Amades and north of Kampia village.

PHRYGANA

Phrygana is very common on Chios and naturally it occupies lower coastal portions of mountains and rocky slopes. In such places it develops as a rule in a rich, multi-specific form which during flowering time of its various components has a truly picturesque appearance. A rich phrygana is composed of a dozen species or so which either occur jointly mixed singly, or in the form of large patches locally dominated by 1-2 species giving it a very characteristic appearance. The most important phrygana species on Chios include *Cistus incanus* L. and *C. salvifolius* L., *Genista acanthoclada* DC., *Erica manipuliflora* Salisb., *Calicotome villosa* (Poiret) Link, *Anthyllis hermanniae* L., *Sarcopoterium spinosum* (L.) Spach., *Coridothymus capitatus* (L.) Reichenb. f., *Satureja thymbra* L. and locally also *Centaurea spinosa* L., *Thymelaea tartonraira* (L.) All., *Euphorbia acanthothamnus* Heldr. et Sart., *Globularia alypum* L., *Cistus parviflorus* Lam. and *Helianthemum nummularium* (L.) Miller. A rich phrygana type develops particularly in the coastal zone of the northeastern part of the island. We have seen it in the vicinity of Marmaron, Nagos, Giosonas and Vikion.

As distinct from the rich phrygana a poor variant of the community is composed exclusively of *Sarcopoterium spinosum* (L.) Spach, or of *Sarcopoterium spinosum* (L.) Spach with a slight addition of *Coridothymus capitatus* (L.) Reichenb. f., *Centaurea spinosa* L. (Fig. 7) and occasionally also *Cistus incanus* L. This type of vegetation usually develops on abandoned fields or in regions after a forest fire. This community occurs in smaller or larger patches on the whole island, however, undoubtedly the largest areas are occupied in the northwestern part e.g. in the vicinity of Chori and Katavasias, in the Amani Mts. between Melanios and Chalandra or else on the plateau located south of Pitios.



Fig. 7. *Centaurea spinosa* on the southern seashore near Agia Markella not far from Volissos. Phot. A. Boratyński

Between the above mentioned extreme phrygana types there occur also several intermediate forms, characterized by unique and distinct specific composition, dependent on the local site conditions and on the form of land utilisation in the past and presently.

HIGH ELEVATION COMMUNITIES

The highest portions of the Pelinaion Mts. and Oros Mts. located above 1000 - 1100 m elevation are more or less covered by low thickets. On the slopes, and particularly in local land depressions and in rock fissures as well as the rock rubble there develops a characteristic community dominated by *Berberis cretica* L. (Fig. 8), *Rosa pulverulenta* Bieb. and *Cerasus prostrata* (Labill.) Ser. (Fig. 9) and in the highest parts also by *Cotoneaster nummularia* Fisch. et Mey., *Amelanchier parviflora* Boiss. and *Ribes orientale* Desf. This community is best developed at an elevation from 1000 to 1200 m, however it reaches to the Pelinaion peak itself and also comes down as low as 800 m, e.g. on the northern and northeastern ridge of the massif over Vikion and Kampia.

At similar elevations however in flat places or only slightly sloping ones there develops a community of cushion-like species of *Astragalus* composed primarily of flat clumps of *Astragalus angustifolius* Lam., attaining even more than 1 m diameters (Fig. 10, 11). In that community



Fig 8. *Berberis cretica* on the calcareous rock above Amades in the Pelinaion Mts., ca 850 m alt. Phot. A. Boratyński



Fig. 9. *Cerasus prostrata* on the eastern slopes of Pelinaion Mt., ca 1150 m alt. Phot. A. Boratyński



Fig. 10. *Astragalus angustifolius* below the top of the Oros Mt., about 1100 m alt.
Phot. A. Boratyński



Fig. 11. A large, about 3 m in diameter carpet of *Astragalus angustifolius*; Oros Mt., ca 1100 m alt. Phot. A. Boratyński

also *Astragalus parnassi* Boiss. occurs as well as the previously mentioned species such as *Berberis cretica* L., *Rosa pulverulenta* Bieb. or *Cercasus prostrata* (Labill.) Ser. Such community is particularly well developed in the peak parts of the Oros Mts.

INTRODUCED TREES AND SHRUBS

In Chios town itself, as well as in other towns and villages one can find in cultivation a whole range of species of trees and shrubs of foreign origin. They can be divided into two basic groups — ornamental species and crop yielding species.

The first group includes species planted in parks (Chios town), in household gardens, along roads and streets. They are particularly frequently represented in the eastern part of the island, mainly along the coast between Chios and Vrontatos and in the north between Kardamila and Marmaron. From such species the most striking are palms (especially in the municipal park in Chios), araucarias (*Araucaria heterophylla* (Salisb.) Franco), which even produce cones, eucalypts and acacias and also *Pittosporum tobira* (Thunb.) Aiton f. and numerous varieties of full-flowered roses. Besides also commonly planted are various trees and shrubs which grow in the island in the wild state as for example *Platanus orientalis* L., *Pistacia atlantica* DC. or *Nerium oleander* L. In



Fig. 12. Plantation of *Pistacia lentiscus* cv. *Chia* near Pirgi

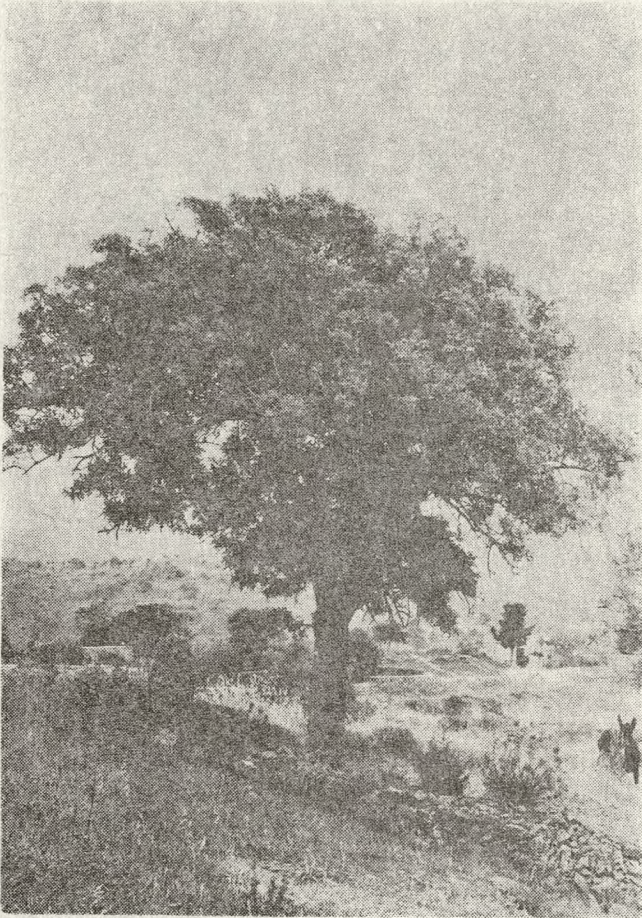


Fig. 13. An old specimen of *Pistacia atlantica* about 8-9 m in high and 40 cm in girth, near Volissos. Phot. A. Boratyński

gardens near homes which as a rule are full of flowers (particularly of Pelargonias), an important role is played by climbing shrubs such as *Jasminum officinale* L., *Lantana camara* L., *Campsis radicans* (L.) Seeman, *Lonicera japonica* Thumb., *Bougainvillea spectabilis* Willd. and even *Eccecmocarpus scaber* Ruiz. et Pav. The dry climate of the island, however, restricts the cultivation of exotics beyond regions where appropriate watering is possible.

More important than decorative plants are the fruit trees and shrubs which are cultivated both in special orchards, sometimes even on a large scale and as single individuals near homes. Plantations of fruit species are particularly common in the region known as Kampos, occupying lowland regions around Chios town, and also south from it. In that region villages are grouped close to each other and they are known collectively as the "Kampochora". Undoubtedly it is here that the largest citrus



Fig. 14. *Cionura erecta* in the valley of Amithountas above Kardamila, ca 200 m alt. Phot. A. Boratyński



Fig. 15. A loose grove of *Pinus brutia* on rocky slopes, ca 2 km S of Kampia, ca 500 m alt.; on the top of the hill locality of *Polygonum icaricum*. Phot. A. Boratyński



Fig. 16. Strongly grazed specimen of *Amelanchier parviflora* on the eastern slope of Pelinaion Mt., ca 1150 m alt. Phot. A. Boratyński

orchards (lemons, oranges) for the whole island occur. On a somewhat smaller scale the cultivation of citrus fruits is also developed near Kardamila, Maramron, Langada, Nagos and Giosonas. In places, as for example in the northern part of the island, north of Kambia and Vikion one can find here and there small neglected citrus orchards not far from the sea in valleys of periodic streams, usually surrounded by stone fences. These are frequently accompanied by single trees of *Punica granatum* L. On a smaller scale, other species of fruits are grown such a *Ceratonia siliqua* L. (also wild), *Ficus carica* L. or *Vitis vinifera* L. and also *Morus alba* L. in its selected large-fruited forms. One should particularly mention the presence on the island of numerous evenaged trees of *Morus nigra* L. This species has not been mentioned from Chios neither in the Flora of Turkey (vol. 7) nor in the conspect

of Meikle (1954). Its native location is not known and most probably it does not grow wild anywhere. Nowhere else besides Chios is *Morus nigra* L. so abundantly represented and this almost in every village. It is particularly common near Kambia, between Agion Gala, and Melanios.

In regions located directly in the vicinity of a village, frequently in narrow valleys of periodic water runs, and in the vicinity of wild growing local species there occurs an intensive cultivation of fruit trees such as *Cerasus avium* (L.) Moench, *Castanea sativa* Miller (Kambia), *Juglans regia* L., *Punica granatum* L., or *Pistacia vera* L. (e.g. near Giosonas).

As regards olive plantations they are not so common on Chios nor as extensive as in other regions of Greece. Larger plantations were observed among other places in regions located near Chios town and particularly along the road to Karyes, in the vicinity of Volissos, Elta, Pirgi, Mesta or Kalamoti. Usually they are accompanied by plantations of almonds the trees of which are located singly on edges of olive plantations.

In the southern part of the island, more or less south of the line running from Lithion—Ag. Georgios Sykousis-Kallimasia there is an extensive cultivation of *Pistacia lentiscus* L. cv. *Chia*, (Fig. 12) and this already from antiquity. It supplies a specific valuable resinous gum known as mastic, the production of which plays an important role in the island's economy, particularly for the inhabitants of the southern villages known under the collective name "Mastichochora" (Browicz 1987).

WILD GROWING TREES AND SHRUBS

ACERACEAE

1. *Acer sempervirens* L.

This species is distributed exclusively in the northern part of the island from 200 to 1000 m elevation. Locally it is very common as for example on the NE slopes of Pelinaion Mt. where it forms small almost monospecific forests (Fig. 3).

This species is exceptionally variable especially in the size and shape of leaves. Those traits are particularly striking in individuals which are strongly grazed, with numerous coppice shoots. The length of leaves varies here from several millimeters to 4(-5) cm, and they can be either distinctly lobed or else through various intermediates completely devoid of lobes. Individuals with small not lobed leaves frequently resemble almost to non-recognition *Phillyrea latifolia*.

It appears probably that such unique modifications in *A. semper-*

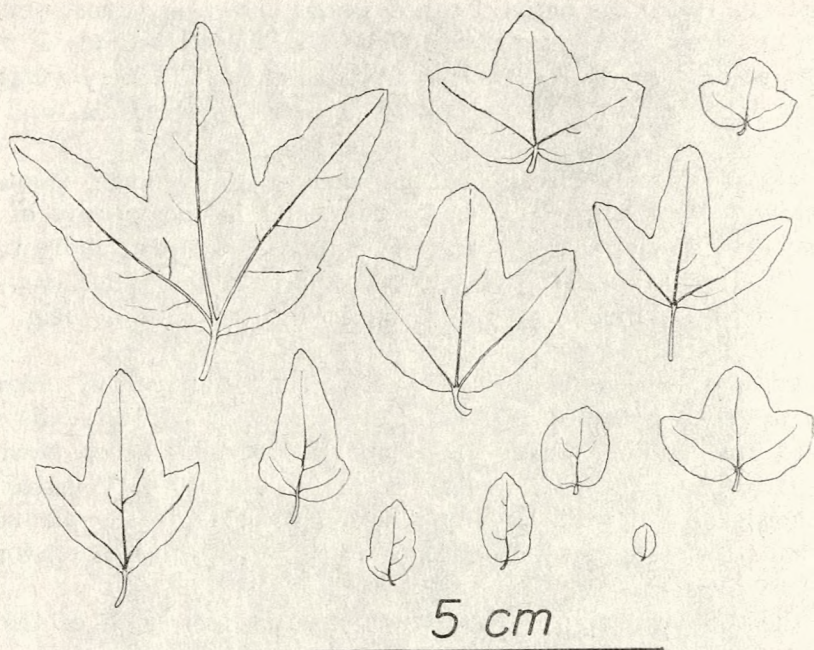


Fig. 17. Variability of leaves of *Acer sempervirens*

virens have been treated by Reehinger (1943) as *A. orientale* var. *phillyreifolium* Rech. f. (Fig. 17).

Considerable variability is also observed in the seed shape (samaras) and pigmentation. Wings are narrow or wide, arranged relative to each other at an acute or an obtuse angle, straw-yellow or through various intermediates darkly purple-red. This latter form is exceptionally decorative.

A. sempervirens has been reported erroneously from Chios as *A. monspessulanum* (Meikle 1954) and *A. orientale* (Reehinger 1943) (Fig. 19).

NW slopes of Kouvalas Mt., 350 - 400 m alt. Small trees and shrubs, scattered, 350 - 400 m alt. BBZ 29; Giosnas W of Kardamila. Thickets on the slope of dry stream, BBZ 35; S slopes of Pelinaion, very frequent up to 800 m, strongly grazed shrubs and small trees, BBZ 48; 62, 64; Kampia, near the road to Spartounta, in thickets, BBZ 161.

ANACARDIACEAE

2. *Pistacia atlantica* Desf.

It grows in tree form, usually singly, almost throughout the island, on edges of fields, roadsides and balks. Probably part of these specimens were planted (Fig. 13 and 20).

1-3 km NE of Marmaron. Along the road from Marmaron to Agia Irini, 20 - 40 m alt., tree, BBZ 3.

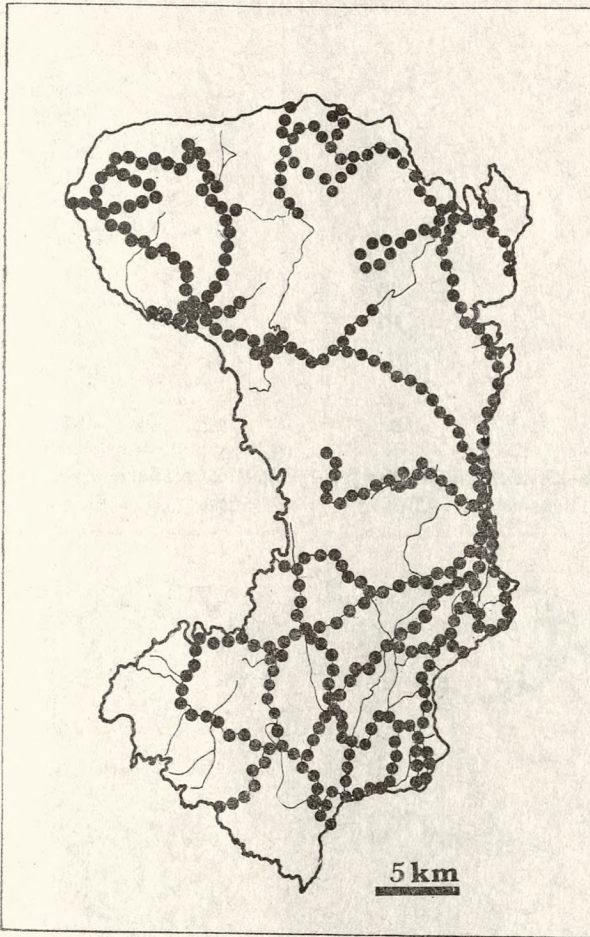


Fig. 18. Map of the authors itineraries on Chios Is.



Fig. 19. *Acer sempervirens* L.

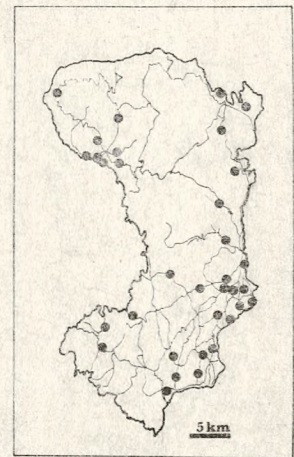


Fig. 20. *Pistacia atlantica* Desf.

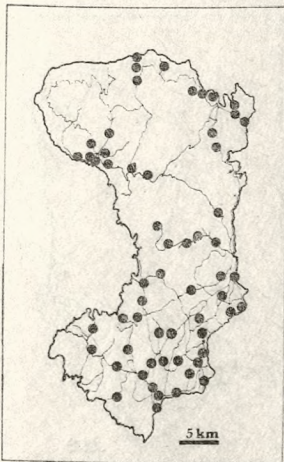


Fig. 21. *Pistacia lentiscus* L.



Fig. 22. *Pistacia terebinthus* L.



Fig. 23. *Nerium oleander* L.



Fig. 24. *Cionura erecta* (L.) Griseb.



Fig. 25. *Gomphocarpus fruticosus* (L.) Aiton f.



Fig. 26. *Hedera helix* L.



Fig. 27. *Berberis cretica* L.



Fig. 28. *Capparis spinosa* L.



Fig. 29. *Lonicera etrusca* Savi



Fig. 30. *Lonicera implexa* Aiton



Fig. 31. *Sambucus nigra* L.



Fig. 32. *Atriplex halimus* L.



Fig. 33. *Halimione portulacoides* (L.) Aellen



Fig. 34. *Suaeda vera* J. F. Gmelin



Fig. 35. *Cistus incanus* L.



Fig. 36. *Cistus parviflorus* Lam.



Fig. 37. *Cistus salvifolius* L.

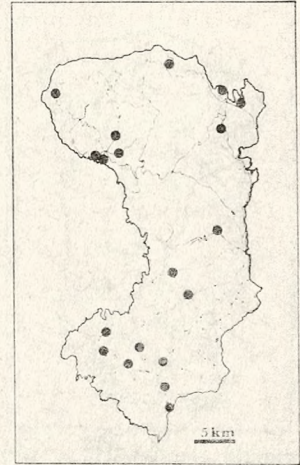


Fig. 38. *Fumana arabica* (L.) Spach



Fig. 39. *Fumana thymifolia* (L.) Spach ex Webb



Fig. 40. *Helianthemum nummularium* (L.) Miller



Fig. 41. *Centaurea spinosa* L.



Fig. 42. *Ptilostemon chamaepeuce* (L.) Less.



Fig. 43. *Convolvulus oleifolius* Desf.



Fig. 44. *Cupressus sempervirens* L. f. *horizontalis* (Miller) Voss



Fig. 45. *Juniperus oxycedrus* L.



Fig. 46. *Juniperus phoenicea* L.



Fig. 47. *Ephedra campylopoda* C. Meyer



Fig. 48. *Arbutus andrachne* L.



Fig. 49. *Arbutus unedo* L.



Fig. 50. *Erica arborea* L.



Fig. 51. *Erica manipuliflora* Salisb.



Fig. 52. *Euphorbia acanthothamnus* Heldr. et Sart.

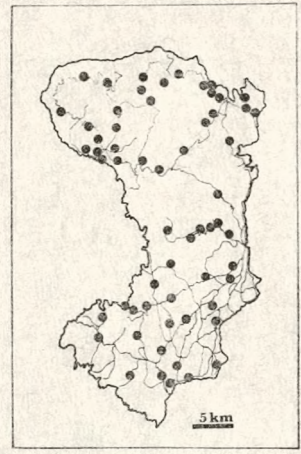


Fig. 53. *Quercus coccifera* L.



Fig. 54. *Quercus infectoria* Oliv.



Fig. 55. *Quercus pubescens* Willd.



Fig. 56. *Globularia alypum* L.



Fig. 57. *Ribes orientale* Desf.



Fig. 58. *Hypericum empetrifolium* Willd.



Fig. 59. *Coridothymus capitatus* (L.) Reichenb. f



Fig. 60. *Lavandula stoechas* L.



Fig. 61. *Micromeria graeca* (L.) Benth. ex Reichenb.



Fig. 62. *Micromeria juliana* (L.) Benth. ex Reichenb.

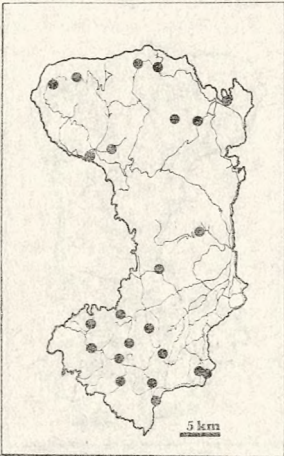


Fig. 63. *Micromeria myrtifolia* Boiss. et Hohen.



Fig. 64. *Phlomis cretica* C. Presl



Fig. 65. *Prasium majus* L.



Fig. 66. *Rosmarinus officinalis* L.



Fig. 67. *Salvia fruticosa* Miller



Fig. 68. *Satureja thymbra* L.



Fig. 69. *Teucrium brevifolium* Schreber



Fig. 70. *Thymra spicata* L.



Fig. 71. *Laurus nobilis* L.



Fig. 72. *Adenocarpus complicatus* (L.) Gay



Fig. 73. *Anagyris foetida* L.



Fig. 74. *Anthyllis hermanniae* L.



Fig. 75. *Astragalus angustifolius* Lam.



Fig. 76. *Astragalus parnassii* Boiss.



Fig. 77. *Astragalus trojanus* Steven ex Fischer

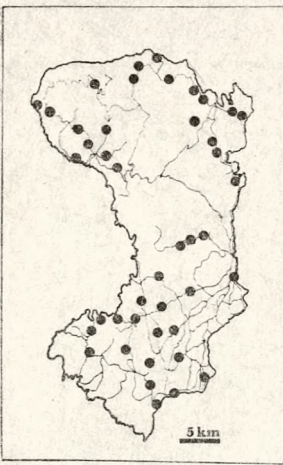


Fig. 78. *Calicotome villosa* (Poiret) Link

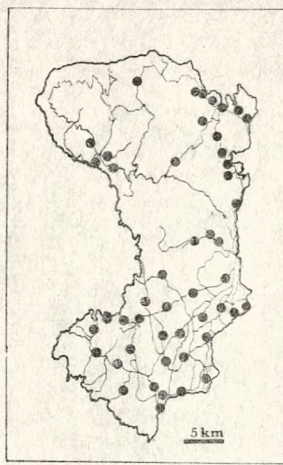


Fig. 79. *Ceratonia siliqua* L.



Fig. 80. *Cercis siliquastrum* L.

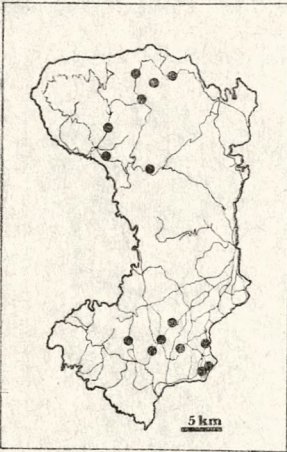


Fig. 81. *Colutea melanocalyx* Boiss. et Heldr. subsp. *davisiana* (Browicz) Chamb.



Fig. 82. *Coronilla emerus* L. subsp. *emeroides* (Boiss et Spruner) Hayek



Fig. 83. *Genista acanthoclada* DC.



Fig. 84. *Genista anatolica* Boiss.



Fig. 85. *Medicago arborea* L.



Fig. 86. *Spartium junceum* L.



Fig. 87. *Ruscus aculeatus* L.



Fig. 88. *Smilax aspera* L.



Fig. 89. *Lavatera bryoniifolia* Miller



Fig. 90. *Myrtus communis* L.



Fig. 91. *Phillyraea latifolia* L.



Fig. 92. *Pinus brutia* Ten.



Fig. 93. *Pinus pinea* L.



Fig. 94. *Platanus orientalis* L.



Fig. 95. *Atraphaxis billardieri* Jaub. et Spach



Fig. 96. *Polygonum icaricum* Rech. f.



Fig. 97. *Clematis cirrhosa* L.



Fig. 98. *Rhamnus alaternus* L.



Fig. 99. *Rhamnus prunifolius* Sibth. et Sm.



Fig. 100. *Amelanchier parviflora* Boiss.



Fig. 101. *Cerasus prostrata* (Labill.) Ser.



Fig. 102. *Cotoneaster nummularia* Fisch. et Mey.



Fig. 103. *Crataegus monogyna* Jacq.



Fig. 104. *Prunus cocomilia* Ten.



Fig. 105. *Pyrus spinosa* Forsskal



Fig. 106. *Rosa agrestis* Savi



Fig. 107. *Rosa canina* L.



Fig. 108. *Rosa phoenicia* Boiss.



Fig. 109. *Rosa pulverulenta* M. Bieb.



Fig. 110. *Rosa sempervirens* L.



Fig. 111. *Rubus ulmifolius* Schott



Fig. 112. *Sarcopoterium spinosum* (L.) Spach



Fig. 113. *Rubia tenuifolia* Urv.



Fig. 114. *Ruta chalepensis* L.



Fig. 115. *Osyris alba* L.



Fig. 116. *Lycium europaeum* L.



Fig. 117. *Tamarix parviflora* DC.



Fig. 118. *Tamarix smyrnensis* Bunge



Fig. 119. *Thymelaea tartonraira* (L.) All.



Fig. 120. *Celtis australis* L.



Fig. 121. *Vitex agnus-castus* L.



Fig. 122. *Vitis sylvestris* C. C. Gmelin

3. *Pistacia lentiscus* L.

This is a very common species throughout the island, except the highest places. Usually it grows in maquis and phrygana, on roadside escarps, on edges of fields, along streams etc. In the South it is commonly planted as cv. *Chia* for mastic-gum production (Browicz, in print) (Fig. 12 and 21).

4. *Pistacia terebinthus* L.

Specimens of this species are scattered throughout the island, usually in the form of a shrub. Single specimens are growing on roadside escarps, edges of fields, on hilly slopes and crevices of rocks (Fig. 22).

NW slopes of Kouvalas Mt., between Kardamila and Pityous, scattered grazed shrubs, 350 - 400 m alt., BBZ 32.

APOCYNACEAE

5. *Nerium oleander* L.

This species is scattered throughout the island, except the higher regions. It usually grows on more or less moist places, in valleys of streams and rivers, especially in the North (Fig. 23).

Agia Markella, W of Volissos, thickets not far from the beach, BBZ 137.

ASCLEPIADACEAE

6. *Cionura erecta* (L.) Griseb.

It grows only in the North-East on dry stony, barren places, in valleys of streams etc.; relatively numerous near Kardamila (Fig. 14 and 24).

1-3 km NE of Marmaron, loose thickets along the road from Marmaron to Agia Irini, 20-40 m alt., BBZ 11; Agia Markella W of Volissos, open sunny places not far from the beach, scattered, BBZ 138.

7. *Gomphocarpus fruticosus* (L.) Aiton f.

This is a south-African species, naturalized in the Mediterranean region. It was not mentioned from Chios but we observed it in three places (Giosnas, Vrondados, Chalkion). It grows also on Samos Is. and near Izmir, in western Anatolia (Fig. 25).

ARALIACEAE

8. *Hedera helix* L.

This species grows only in the North, in shady places, usually on rocks, climbing in thickets or creeping on the ground in *Acer sempervirens-Phillyrea latifolia* groves (Fig. 26).

Pelinaion Mt., scattered on rocks in shady places, ca 600 m alt., BBZ 49.

BERBERIDACEAE

9. *Berberis cretica* L.

This species is distributed only in the northern part of the island, on few localities. More commonly it occurs above 500 - 600 m elevation, as in Pelinaion massif, where it forms almost pure thickets (Fig. 8 and 27).

N slopes of Pelinaion Mt., in thickets and open rocky places, 350 - 400 m, frequently up to the summit, BBZ. 46, 154; N slopes of Oros Mt., the climb from Kardamila, open sunny and rocky places, frequent above 870 - 900 m, BBZ 189.

CAPPARIDACEAE

10. *Capparis spinosa* L.

Scattered specimens of this species occur in lower regions of the northern and southern parts of the island, chiefly in phrygana on roadside escarpes and on hilly slopes (Fig. 28).

Side of road between Lindos and Agia Markella W of Volissos, BBZ 134.

CAPRIFOLIACEAE

11. *Lonicera etrusca* Savi

This species is distributed throughout the island, usually growing in thickets of maquis, more rarely in the open places in rocky crevices, sometimes also on ruderal sites (Fig. 29).

W slopes of Amani Mt., the climb from Agion Gala, on rocks, BBZ 125.

12. *Lonicera implexa* Aiton

This is a new species for the flora of Chios. The abundant blooming specimens of this climbing, evergreen shrub we saw only in the North, on relatively moist sites in thickets of maquis. Here, on Chios, as well as on Samos and Levsos *Lonicera implexa* attains its eastern limit of distribution (Fig. 30).

Wayside thickets between Kampia and Vikon, rare, BBZ 78; Kampia, wayside thickets along the road to Spartounta, BBZ 80.

13. *Sambucus nigra* L.

It is represented in antropogenic habitats of the western part of the island (e.g. Vrondados, Marmaron, Karyes). (Fig. 31).

CHENOPODIACEAE

14. *Atriplex halimus* L.

This is a new species for the flora of Chios. We discovered it only once, in the southern, maritime part of the island, near Gridia, where it is represented quite abundantly on the seaside, near the road to Ne-

nita and not far away on the chalky slope amongst thickets of maquis. The nearest localities are mentioned from the Cyclades, island of Skyros (Fig. 32).

Gridia, along the road to Nenita, frequent on calcareous slopes above the road, just above sea level, BBZ 221.

15. *Halimione portulacoides* (L.) Aellen

This is a new species for the flora of Chios. We found it only on two stands in the southern part of the island. It is especially abundant in Komi, where it forms dense and compact clumps along the beach near the mouth of river Katraris. The second stand, on maritime rocks in Agios Fotinis is very poor and severely devastated by holiday-makers (Fig. 33).

Komi, Very frequent on sandy places along the beach and on the banks of river, BBZ 103.

16. *Suaeda vera* J. F. Gmelin

This is a new species for the flora of Chios. We found it in the southern part of the island near Komi. It grows in phrygana, on a chalky slope hardly few meters above the sea level. The nearest localities are known from Naxos Is. and Attiki (Fig. 34).

Komi, calcareous rocks above the sea, along the road to Agios Joannis, rare, BBZ 217.

CISTACEAE

17. *Cistus incanus* L.

It occurs throughout the island except the highest regions; common in maquis and phrygana, and in the forest destroyed by fires (Fig. 35).

18. *Cistus parviflorus* Lam.

This species occurs almost exclusively in the South-West, in maquis and phrygana, especially in lower regions of the island (Fig. 36).

Ca 2 km before Pirgi, wayside thickets along the road from Armolia, remnants of maquis, BBZ 91; NE of Marmaron, degraded maquis along the road to Agios Taxiarchis, BBZ 175, 176.

19. *Cistus salvifolius* L.

This species is common, in loose thickets of maquis and phrygana especially in the South, exclusively in lower parts of the island (Fig. 37).

1-3 km NE of Marmaron, in phrygana near the road from Marmaron to Agia Irini, 20-40 m alt., BBZ 18.

20. *Fumana arabica* (L.) Spach

This species is scattered throughout the island, except the higher regions, as a rule in phrygana; sometimes it is quite common (Fig. 38).

Loose wayside thickets along the road from Marmaron to Agia Irini, 20-40 m alt., BBZ 23; Agios Georgios Sykousis, along the way to Anavatos, in phrygana, BBZ 214.

21. *Fumana procumbens* (Dunal) Gren. et Gordon

This species was mentioned from the top of the Pelinaion Mts. (Meikle 1954), but we did not find it here.

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

This taxon occurs almost exclusively in the South of the island, on waysides, balks, usually in phrygana and in general very commonly.

F. thymifolia is represented on Chios by two varieties: var. *thymifolia* with densely glandular leaves, which we found only near Volissos, and the more common var. *viridis* (Ten.) Boiss., with leaves smooth, without glands.

Near Agios Georgios Sykousis, in wayside phrygana, we collected several interesting specimens of this latter variety. (nr 208, 209). They are characterized by very short internodes which results in leaves and shoots being very crowded. Several plants with such a compact habit grow among numerous typical individuals of var. *viridis* (Fig. 39).

var. *thymifolia*

1-2 km NE of Volissos, among low scrub on the wayside, rare, BBZ 141.

var. *viridis* (Ten.) Boiss

1-3 km NE of Marmaron, wayside loose thickets between Marmaron and Agia Irini, BBZ 34; Wayside thickets between Pirgi and Emporia, BBZ 101; Between Anavatos and Avgonyma, side of road, in low scrub, BBZ 200; Between Agios Georgios Sykousis and the cross-road toward Anavatos and Lithi, in low scrub on the wayside, BBZ 208, 209 (forma); Agios Georgios Sykousis, in low scrub along the road to Anavatos, BBZ 215, 216.

23. *Helianthemum lavandulifolium* Miller

This species was recorded from Chios by Pauli (Rechinger 1943) but we did not see it in any place.

24. *Helianthemum nummularium* (L.) Miller

This species is rare and occurs only in the North. It grows on open, grassy places, clearings and roadside escarpments. Our specimens belong to subsp. *nummularium*, but specimens collected by Platt from Kardamila, according to the opinion of Meikle (1954) represent subsp. *graecum* (Boiss. et Heldr.) Boiss. (Fig. 40).

N slopes of Pelinaion Mt., open sunny places, rare, 400-800 m alt. BBZ 59, 61.

COMPOSITAE

25. *Centaurea spinosa* L.

It grows on dry, insolated, sandy places from sea level to an elevation 600 m, common only in the West. Especially beautiful, cushion-

-like specimens we observed near the sea shore in Melanios and in Agia Markella W of Volissos (Fig. 7 and 41).

Agios Nikolaos below Vikion, cushion-like forms near the beach, BBZ 87; Vikion, dry places near the road to Amades, BBZ 88; Sandy wayside between Karfas and Mega Limenas, frequent, BBZ 213.

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

It occurs on scattered stands, mainly in the eastern part of the island, usually on the steep, rocky slopes (Fig. 42).

Agios Georgios, N of Kambia, coastal rocks, frequent, BBZ 167.

CONVOLVULACEAE

27. *Convolvulus oleifolius* Desf.

This is a new species for the flora of Chios. We have found it on two localities in the northern part of the island. In Lamia W of Volissos it is represented by a form with a compact habit, relatively broad and densely silky pubescent leaves and many-flowered inflorescences, while on the north-eastern promontory of the island near Marmaron we exclusively observed individuals with a loose habit, narrow, rather sparsely pubescent leaves and 1 - 3 flowered inflorescences.

The nearest localities of *C. oleifolius* are known from Samos and from the vicinity of Izmir in west Anatolia (Fig. 43).

1-3 km NE of Marmaron, loose wayside thickets between Marmaron and Agia Irini, BBZ 21, 33; NE of Marmaron, wayside thickets along the road from Agia Irini to Agios Taxiarchis, BBZ 173; Limia SSW of Volissos, stony sunny hillside above the beach, frequent, BBZ 144.

CUPRESSACEAE

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

This taxon is new for the flora of Chios. We observed it only in one place, near Giosnas, where on the rocky slopes of a stream valley many specimens of different age and size grow. This locality looks completely natural. In other parts of Chios we never saw any trees, of this form in culture. The nearest locality of f. *horizontalis* is known from Samos Is., so in Chios it attains the northern limit of its area (Fig. 5 and 44).

Giosnas NW of Kardamila, slopes of a dry stream valley, 150-200 m alt. frequent, BBZ 36.

29. *Juniperus oxycedrus* L.

It is represented only on few stands in the central and northern part of the island, occurring in open thickets of maquis or in loose pine forests, usually in the form of small and grazed specimens (Fig. 45).

E of Nagos, slopes above the sea, BBZ 42; N slopes of Oros Mt., the climb from Kardamila, rocky places with *Acer sempervirens*, BBZ 186.

30. *Juniperus phoenicea* L.

It is distributed over the greater part of the island, on scattered stands, in loose and degraded maquis. In the North it is only local, but often abundant, especially in the Oros massif, where on the southern slopes forms wide, congeneric communities; moreover it usually occurs in dispersal (Fig. 6 and 46).

Juniperus phoenicea was not mentioned by Re chinger (1943), nor by Meikle (1954) and Davis (1965).

1-3 km NE of Marmaron, remnants of maquis near the road from Marmaron to Agia Irini, 20-40 m alt., BBZ 19; NW slopes of Kouvalas Mt. between Kardamila and Pityous, loose thickets of *Prunus cocomilia*, *Acer sempervirens* and *Pistacia terebinthus*, 350-400 m alt., BBZ 30; ca 2 km before Pirgi, wayside thickets along the road from Armolia, remnants of maquis, BBZ 92.

EPHEDRACEAE

31. *Ephedra campylopoda* C. Meyer

Syn.: *E. fragilis* Poir. subsp. *campylopoda* (C. Meyer) Aschers. et Graebn.

This species grows only on few localities, usually in crevices rarely in maquis (Fig. 47).

E of Nagos, slopes above the sea, rare, BBZ 40; Agios Georgios Sykousis, a slope below the cemetery, BBZ 204.

ERICACEAE

32. *Arbutus andrachne* L.

This is a new species for the flora of Chios. It grows in the neighbouring islands Ikaria and Samos and in western Anatolia. We observed it on scattered stands, mainly in the lowland area of the southern part of the island, exclusively in the maquis; quite often it was represented only by specimens with stump sprouts (Fig. 48).

Degraded maquis between Kalamoti and Emporia, rare, BBZ 106.

33. *Arbutus unedo* L.

It occurs in the lower part of the island, mainly in the South and in maquis, while in the North also in pinewoods; usually it grows here in the form of a small shrub (Fig. 49).

NW slopes of Kouvalas Mt. between Kardamila and Pityous, 350-400 m, remnants of maquis, BBZ 27.

34. *Erica arborea* L.

It is represented on the island by few stands with few specimens, in degraded maquis. It usually grows in a shrubby form (Fig. 50).

Thickets of maquis below Vikion, along the way to Agios Nikolaos, scattered BBZ 84.

35. *Erica manipuliflora* Salisb.

This species is distributed throughout the island on scattered stands, in phrygana and destroyed maquis; in some places it is quite common (Fig. 51).

1-3 km NE of Marmaron, the edge of degraded maquis along the road from Marmaron to Agia Irini, 20-40 m alt., BBZ 4.

EUPHORBIACEAE

36. *Euphorbia acanthothamnus* Heldr. et Sart.

This is a new species for the flora of Chios occurring only on lower sites, especially in the South, mainly on a rocky substratum, in phrygana, more rarely in open pine forests; locally it is even common. The nearest localities are known from Ikaria and Samos and from western Anatolia (Fig. 52).

Ca 2 km before Pirgi, along the way from Armolia, the wayside covered with phrygana, BBZ 90; Between Anavatos and Avgonyma, in the loose *Pinus brutia* forest, stony slope, BBZ 199.

FAGACEAE

37. *Quercus coccifera* L.

This oak is common throughout the island. It grows right from the sea level to the highest places, usually in shrubby form, rarely as a big tree (e.g. in Kampia) (Fig. 53).

Kampia. The large tree near the road to Spartounta, BBZ 77.

38. *Quercus infectoria* Oliv.

This is a new species for the flora of Chios. The single, small tree of this oak we found in the North, on only one stand. It grows here in the roadside thickets of a destroyed maquis. The nearest stands are known from the western Anatolia (Fig. 54).

Edge of maquis beyond the village Vikion, along the way to Agios Nikolaos, single small tree, BBZ 85.

39. *Quercus pubescens* Willd.

This species is scattered on Chios, but more often it occurs in the North, where it even forms small and loose clusters (Fig. 2 and 55).

1-3 km NE of Marmaron, small single trees along the road from Marmaron to Agia Irini, 20-40 m alt.; BBZ 22; Giosnas NW of Kardamila, thickets on slope of a dried stream valley, 150-200 m, BBZ 43; N slope of Pelinaion Mt., 500-600 m alt., scattered in thickets, BBZ 45; Amani Mt., slope above Agion Gala, scattered, BBZ 121.

GLOBULARIACEAE

40. *Globularia alypum* L.

This is a new species for the flora of Chios. We found it only in the southern part of the island, on few, rather scanty stands, in phrygana and in more or less degraded maquis. The stands nearest to Chios are known from western Anatolia, from the Çesme peninsula (province of Izmir) (Fig. 56).

Between Olimpi and Pirgi, wayside thickets of phrygana, rare, BBZ 96; Between Nenita and Gridia, degraded maquis along the road, rare, BBZ 220.

GROSSULARIACEAE

41. *Ribes orientale* Desf.

This is a new species for the flora of Chios, occurring on only two stands in the northern part of the island, on the highest places of Pelinaion and Oros Mts. It grows sufficiently often in the crevices of calcareous rocks together with *Berberis cretica* L. and *Cerasus prostrata* (Labill.) Ser. These localities are very isolated from others in the whole range of the species. The nearest ones are in SW continental Greece (Sterea Ellas, Peloponnisos) and Euboea (Fig. 57).

Pelinaion Mt., rocks at the top of Profitis Ilias, 1297 m alt., strongly grazed, BBZ 69; Oros Mt., rocky places, crevices at the top, 1100 - 1120 m, grazed, BBZ 191.

GUTTIFERAE

42. *Hypericum empetrifolium* Willd.

This species is rather common throughout the island, but not in the higher regions. It grows at edges of roads and groves, on stony slopes, on balks and inside pine forests (Fig. 58).

Marmaron. Edge of *Pinus brutia* forest, frequent, BBZ 180.

LABIATAE

43. *Coridothymus capitatus* (L.) Reichenb. f.

This species is common throughout the island, especially in the South, usually in phrygana, on the wast-lands and road escarps (Fig. 59).

Agia Markella W of Volissos, open sunny places along the road to Volissos, BBZ 140.

44. *Lavandula stoechas* L.

It grows throughout the island except the higher regions, on roadside escarps and in waste lands, usually in phrygana or in degraded maquis; sometimes it is common (Fig. 60).

1 - 3 km NE of Marmaron, phrygana near the road from Marmaron to Agia Irini, 20 - 40 m alt., BBZ 16; NW slopes of Kaouvalas Mt, between Kardamila and Pityous, 350 - 400 m alt., degraded maquis, BBZ 28.

45. *Micromeria graeca* (L.) Bentham ex Reichenb.

This is a new species for the flora of Chios, but very rare. We observed a few specimens of this species in the southern part of the island near Pirgi, at the edge of an olive plantation (BBZ 112). Nearest is known from the islands of Samos, Icaria and Lesvos, and also from western Anatolia (Fig. 61).

46. *Micromeria juliana* (L.) Bentham ex Reichenb.

This species is scattered in the central and northern parts of the island, occurring on rocky slopes and sometimes also in wall fissures (Fig. 62).

Ca 1 km SE of Kampia, rocky slopes of Kefala Mt, ca 300 m alt. BBZ 169; Nea Moni, walls of the closter, in crevices, BBZ 202.

47. *Micromeria myrtifolia* Boiss. et Hohen.

This species is scattered in the lower regions of the island, growing usually on roadside escarps and balks (Fig. 63).

Wayside thickets below the village Vikion, along the road to Agios Nikolaos, BBZ 86.

48. *Phlomis cretica* C. Presl

This is a new species for the flora of Chios. We found only a few specimens of this shrub in the southern part of the island, near the road from Pirgi to Emporia, in a phrygana community. This locality is very interesting from the geographical point of view, because *Phlomis cretica* is known only from the southern Aegean islands — Kriti, Antikithira, Kithira and Rodhos (Fig. 64).

Wayside thickets between Pirgi and Emporia, very rare, BBZ 98.

49. *Prasium majus* L.

This species is scattered in the lower part of the island and occurs on insolated places, at edges of olive plantations, on banks of drying-up rivers and streams, sometimes quite commonly (Fig. 65).

1-3 km NE of Marmaron, loose thickets near the road from Marmaron to Agia Irini, 20-40 m alt., BBZ 15; NE of Marmaron, in low scrub along the road to Agios Taxiarchis, BBZ 174.

50. *Rosmarinus officinalis* L.

This species is represented in the island by only few localities situated in the South and along the eastern coast, where it grows on roadside escarps and balks, usually not far from buildings. Perhaps some of these stands are of secondary character (Fig. 66).

1-3 km NE of Marmaron, loose thickets along the road from Marmaron to Agia Irini, the edge of the neglected orchard, 20-40 m alt., BBZ 14.

51. *Salvia fruticosa* Miller

It is rather common throughout the island, especially in the South; usually in phrygana (Fig. 67).

Giosnas NW of Kardamila. Slopes of a dried stream valley, 150-200 m alt., BBZ 38.

52. *Satureja thymbra* L.

This small shrub is scattered over the lower regions of the island, on roadside escarps, grass-lands, balks etc., in some places even common (Fig. 68).

1-3 km NE of Marmaron, loose thickets along the road from Marmaron to Agia Irini, 20-40 m alt., BBZ 10; W slopes of Amani Mt., the climb from Lindos and Agia Markella, sunny, stony places, BBZ 132.

53. *Teucrium brevifolium* Schreber

This is a new species for the flora of Chios. We discovered it on two stands, quite close one to another, in the south-western part of the island. It grows here on the steep slopes above the roads. This locality is the most northern for the whole range of *Teucrium brevifolium*; the nearest localities are known from the Cyclades and Dodecanese (Fig. 69).

High waysides between Pasalimani and the bay Ormos Elatas, NNE of Mesta, BBZ 117.

54. *Thymbra spicata* L.

It grows in the South, on roadsides escarps, balks, waste lands and on the edges of olive and pistacia plantations, in some places quite abundantly (Fig. 70).

Open, sunny places above the road between Olimpi and Pirgi, rather frequent, BBZ 97; Wayside thickets between Kalamoti and Armolia, BBZ 109; Low scrub on the wayside between Agios Georgios and cross-road toward Anavatos and Lithi, BBZ 207; Between Katarraktis and Kalimassia, thickets along the road, very frequent, BBZ 222.

LAURACEAE

55. *Laurus nobilis* L.

This is a new species for the flora of Chios. We found it only on few stands in the North and in central part of the island, in semishady and more or less moist places. The nearest stands are known from Lesbos, Samos and from western Anatolia, near Izmir (Fig. 71).

NE of Marmaron. The bank of a dried stream, above the Parapanda Bay, BBZ 65; Kampia, in thickets at the stream, BBZ 168.

LEGUMINOSAE

56. *Adenocarpus complicatus* (L.) Gay

It grows only on few close stands in the northern part of the island, in open, degraded maquis and at the edges of the pinewoods; in some places quite common (Fig. 72).

Between Kampia and Vikion, frequent above the road in maquis, BBZ 79.

57. *Anagyris foetida* L.

This shrub is distributed throughout the whole island and grows in loose thickets of maquis, on roadside escarpments and hilly slopes, at edges of olive plantation and sometimes inside pinewoods (Fig. 73).

1-3 km NE of Marmaron Loose thickets along the road from Marmaron to Agia Irini, 20-40 m alt., BBZ 13.

58. *Anthyllis hermanniae* L.

It grows throughout the island, in some places very commonly, in phrygana, degraded maquis and waste lands. The specimens from Agia Pandes (quoted below) are characterized by bright, almost white flowers and were clearly distinguished from specimens of the typical population (Fig. 74).

Agia Pandes SW of Pirgi, among rocks above the beach, BBZ 114.

59. *Astragalus angustifolius* Lam.

It occurs only in the northern part of the island, in the massif of Oros. It was also collected by Platt (Meikle 1954) in the neighbouring region, in „Amades, Pytios area” (Fig. 10, 11, '75).

Oros Mt. N slopes, open rocky places, 870 m alt., very frequent, cushion-like forms, flowers white, BBZ 187.

60. *Astragalus parnassii* Boiss.

This is a new species for the flora of Chios. We discovered it on Pelinaion Mts., however, only in the higher and sunny places. It is represented here by two subspecies — the typical one and subsp. *cylleneus* (Boiss. et Heldr. ex Fischer) Hayek. The nearest known localities are from western Anatolia (Fig. 76).

subsp. *parnassii*

N slopes of Pelinaion Mt., open sunny places, ca 400-800 m alt., BBZ 54; Pelinaion Mt., the climb from Kampia, open places, 1000 m alt., BBZ 150 (det. D. F. Chamberlain).

subsp. *cylleneus* (Boiss. et Heldr.) Hayek

N slopes of Oros Mt., the climb from Kardamila, open stony places, ca 700 m alt., BBZ 184; Pelinaion Mt., the climb from Kampia, open sunny places, ca 1000 m alt., BBZ 184 (det. D. F. Chamberlain).

61. *Astragalus ptilodes* Boiss.

The species was mentioned by Meikle (1954) but afterwards this information was not confirmed by Chamberlain in „Flora of Turkey” (1970); our researches did not give any results.

62. *Astragalus trojanus* Steven ex Fischer

This is a rare species on Chios, growing in the lower regions, on sunny places (waste lands, rocks etc.) (Fig. 77).

Karyes W of Chios, among rocks above the village, BBZ 111; Loose *Pinus brutia* forest between Agios Georgios Sykousis and the cross-road toward Anavatos and Lithi, BBZ 211 (det. D. F. Chamberlain).

63. *Calicotome villosa* (Poiret) Link

It is the common species throughout Chios except the highest places in the northern part of the island (Fig. 78).

Ca 1 km NW of Volissos, stony hillside above the road, degraded maquis, very frequent, BBZ 146.

64. *Ceratonia siliqua* L.

This species grows throughout the island except the highest regions, usually singly or in small groups along the roads, on edges of olive orchards, rarely in maquis; probably also planted (Fig. 79).

Marmaron, edge of an olive orchard, frequent, BBZ 178.

65. *Cercis siliquastrum* L.

This species is scattered in lower parts of Chios, along roads, orchards or in maquis, both as a shrub or in the form of a small tree (Fig. 80).

1-3 km NE of Marmaron, along the road from Marmaron to Agia Irini, in thickets, 20-40 m alt., BBZ 2.

66. *Colutea melanocalyx* Boiss. et Heldr. subsp. *davisiana* (Browicz) Chamb.

It is scattered in the North and the South of the island, on relatively moist sites, usually in maquis, rarely at the edges of orchards and road escarpments. It was mentioned from Chios as *C. arborescens* L. (Meikle) (Fig. 81).

N slopes of Pelinaion Mt., rare in thickets, ca 600 m alt., BBZ 55; Amades, high wayside near the village, edge of maquis, BBZ 66, 67, 68; Kampia, wayside thickets along the road to Spartounta, rare, BBZ 75.

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

This species grows on scattered localities from the sea level up to 600 m elevation, on rocks, in valleys of streams etc. (Fig. 82).

E of Nagos, slopes above the sea, BBZ 41; Valley of dry river near Agios Georgios, N of Kampia, BBZ 165.

68. *Genista acanthoclada* DC.

This is the common species, especially in the lower regions of the island occurring on roadside escarps, balks, in open pinewoods etc. (Fig. 83).

Side of road between Lindos and Agia Markella, W of Volissos, frequent BBZ 136.

69. *Genista anatolica* Boiss.

This is a new species for the flora of Chios. We found it on few, scattered localities, both in the southern as northern parts of the island. It occurs on open places, in loose pine forests in waste lands, on deeply grazed slopes and roadside escarps, in the form of smaller or bigger clusters. It is represented by two forms here. The typical one has the twigs covered by straight and curled hairs while in the second form the hairs are exclusively straight and restricted to the ridges of twigs and margins of leaves. The nearest stands are known from Lesbos Is. and western Anatolia (Fig. 84).

Loose *Pinus brutia* forest between Kampia and Amades, near the cross-road with the way to Agios Nikolaos, frequent, BBZ 83; Wayside thickets and the waste land between Pirgi and Elata, common in places, BBZ 115; 116; BBZ 206.

70. *Medicago arborea* L.

This is a new species for the flora of Chios. We found it on atropogenic sites, near villages. It is not unlikely that shrub grows here as a refuge from the culture. In the region of Lithi *Medicago arborea* is also planted in pine forest (Fig. 85).

Amades, the edge of orchard along the way on Pelinaion Mt., Planted?, BBZ 163; On ruderal places among buildings between Chios and Vrondados, BBZ 196.

71. *Spartium junceum* L.

It is very common in the northern part of the island more rare and not so numerous in the southern one; usually in thickets of maquis (Fig. 86).

W slopes of Amani Mt., the climb from Agion Gala, common in places, BBZ 127.

LILIACEAE

72. *Ruscus aculeatus* L.

This is a new species for the flora of Chios. We discovered it only in one very poor locality, in crevices of a rocky slope of Amani Mt., in the north-western part of the island. The nearest occurrence of this species is known from western Anatolia, province Izmir (Fig. 87).

W slope of Amani Mt., climb from Agion Gala, among rocks, rare, BBZ 124.

73. *Smilax aspera* L.

This evergreen climber is quite common in the southern part of Chios and along the eastern coast, in maquis and phrygana; the luxuriant specimens are observed on more moist sites (Fig. 88).

Megali Vigla, NE of Marmaron, along the stream, BBZ 177.

MALVACEAE

74. *Lavatera bryoniifolia* Miller

It occurs locally in the north-western, central and southern parts of the island, usually along the road and stony river-banks, on more or less sunny places. On one stand, northwest of Volissos, it grows quite abundantly on the bank of dried up river and here numerous specimens attain the height of 3 m or more (Fig. 89).

Wayside thickets between Piri and Emporia, scattered, BBZ 100; Agia Markella, W of Volissos, waysides, common in places, BBZ 135.

MYRTACEAE

75. *Myrtus communis* L.

This species is rather common on Chios, usually growing in lower regions on more or less moist and shady sites, in some places quite abundantly (Fig. 90).

1-3 km NE of Marmaron, degraded maquis along the road from Marmaron to Agia Irini, 20-40 m alt., BBZ 5.

OLEACEAE

76. *Phillyrea latifolia* L.

This species is scattered throughout the island. It grows usually in maquis, most commonly on northern slopes of Pelinaion where one can find even tree-like specimens (Fig. 91).

1-3 km NE of Marmaron, remnants of maquis, near the road to Agia Irini, 20-40 m alt., BBZ 25.

PINACEAE

77. *Pinus brutia* Ten.

This is the only tree species in Chios forming true forests, especially in the central and north-eastern parts of the island. Between Marmaron and Agia Irini we found a very interesting form of this species with a narrow, pyramidal crown described recently from NW Anatolia — var. *pyramidalis* Selik (Selik 1961-62). It is a new taxon for the flora of Greece (Fig. 92).

Ca 1 km NW of Volissos, stony hillsides beyond the road to Pirama, frequent, BBZ 147.

78. *Pinus pinea* L.

This is a new species for the flora of Chios (wild?). Single trees of this very characteristic pine we observed only in the North, near Marmaron on the north-western slopes of Korifi hill at 200-250 m elevation and between Marmaron and Lagos (nearer the latter village) in an open *Pinus brutia* forest (Fig. 93).

PLATANACEAE

79. *Platanus orientalis* L.

This tree occurs in the northern and central parts of the island, on more moist sites, along rivers and streams, moreover it is often planted in villages (Fig. 94).

W slopes of Amani Mt., a stream valley above Agion Gala, BBZ 129.

POLYGONACEAE

80. *Atraphaxis billardieri* Jaub. et Spach.

It grows only in the North, on the slopes of Pelinaion, where it is represented by not numerous specimens. Previously it was also collected in the same massif by Platt (Meikle 1954) (Fig. 95).

Pelinaion Mt., Climb from Kampia, among stones, rare, ca 1000 m alt. BBZ 155.

81. *Polygonum icaricum* Rech. f.

This is a new species for the flora of Chios, known up to this time only from Ikaria and Samothraki. We found it in the northern part of the island, near Kampia, on the slopes of a small hill Kefala, c 500 m elev. It grows here in numerous specimens in crevices of steep, serpentine rocky walls. In more accessible places it is heavily grazed (Fig. 15 and 96).

Ca 1 km N of Kampia, rocky slopes of Kefala Mt, in crevices, ca 500 m alt., rare, grazed, BBZ 162, 170, 171.

RANUNCULACEAE

82. *Clematis cirrhosa* L.

It occurs throughout the island, except the highest places, most often in maquis, sometimes in prostrate form on roadside escarps, in some places very commonly, especially on moister sites (Fig. 97).

1-3 km NE of Marmaron, remnants of maquis near the road from Marmaron to Agia Irini, 20-400 m alt., BBZ 26; Vikion, dense thickets on a slope below the road to Kampia, BBZ 82; Near the village Mesta, by the way to Pirgi, wayside thickets among stones, strongly grazed, BBZ 94; Near the village Olimpi by the way to Pirgi, phrygana on the escarpment, among stones, BBZ 95.

83. *Clematis flammula* L.

This species was collected only once by Platt (K!) in the region of Kampos, but we did not see it in any places.

RHAMNACEAE

84. *Rhamnus alaternus* L.

This evergreen species is scattered in the lower regions of the island, but it grows usually singly or in small groups, both in dry and moist localities (Fig. 98).

1-3 NE of Marmaron, remnants of maquis along the road from Marmaron to Agia Irini, 20-40 m alt., BBZ 17.

85. *Rhamnus prunifolius* Sibth. et Sm.

It occurs only in the Pelinaion massif above 400-500 m. It is rather common only above 800 m, below the top of Profitis Ilias (Fig. 99).

N slopes of Pelinaion Mt., sunny, rocky places, ca 400-800 m alt., rather frequent up to the summit, BBZ 52, 57; Pelinaion Mt., the climb from Kampia, ca 1000 m alt., among scrub, BBZ 149, 157.

ROSACEAE

86. *Amelanchier parviflora* Boiss.

It is a new species for the flora of Chios. It is known only in south-western Anatolia and on one Greek island Samos. We found it on the north-eastern slopes of the Pelinaion ridge, just below the pass between two tops Profitis Ilias and Koilia at ca 1100-1150 m elevation. In some places it occurs abundantly but usually it is intensively grazed, on the calcareous, stony slopes, associated with *Berberis cretica* L. and *Cerasus prostrata* (Labill.) Ser. (Fig. 16 and 100).

Pelinaion Mt., NE slope, scattered among rocks, grazed, 1000-1100 m alt., BBZ 71, 72, 159, 160.

87. *Cerasus prostrata* (Labill.) Ser.

This species grows on a few localities in northern and central part of the island, in some places very commonly e.g. on Pelinaion and Oros Mts. It blooms and fruits very abundantly. On Chios *C. prostrata* occurs exclusively as typical variety with leaves densely tomentose below (Fig. 9 and 101).

N slopes of Pelinaion Mt., sunny rocky places, ca 600 m alt., frequent up to the summit, grazed, BBZ 60; Ca 1 km SW of Kampia, rocky slopes of Kefala Mt, rare, grazed, ca 500 m alt., BBZ 172; N slopes of Oros Mt., very frequent on rocky, sunny places, between 870-1000 m alt., BBZ 188, 192; Between Avgonyma and the cross-road to Nea Moni, in low scrub above road, ca 650 m alt., BBZ 201.

88. *Cotoneaster nummularia* Fisch. et Mey.

This species grows only in the North, in the massif of Pelinaion, above 1000 m elevation, on sunny, rocky places; small creeping shrubs (Fig. 102).

Pelinaion Mt., rocky places below the top of Profitis Ilias, ca 1000-1250 m alt., scattered, grazed, BBZ 70, 151, 158, 159 b.

89. *Crategus monogyna* Jacq.

It grows on scattered stands, in maquis, on waysides, edges of orchards and roads escarps. It is more common only in the North especially in the massif of Pelinaion. Beside the typical form with broad, shallow leaf lobes there occurs also a form with leaves deeply and narrowly lobed. From our observations it appears that the latter form replaces the typical one in the higher regions, from 500 to 1000 m elevation.

The interesting specimens of this hawthorn we collected in the North near Kambia (BBZ 166). Vegetatively it does not differ from the typical *C. monogyna* but it has fruits with two stones (Fig. 103).

N slopes of Pelinaion Mt., scattered in thickets of *Acer sempervirens* and *Prunus cocomilia* up to 800 m, BBZ 47, 53; W slopes of Amani Mt., degraded pastures, scattered, BBZ 119; Valley of dry river near Agios Georgios N of Kambia, BBZ 166.

90. *Prunus cocomilia* Ten.

This is a new species for the flora of Chios. We observed it on quite numerous stands especially in north-western parts of the island, while in the south it is entirely lacking. Locally e.g. on northern slopes of Pelinaion it occurs very abundantly both as a shrub or in the form of a small tree up to 0-25 cm in diameter. The older and taller specimens fruit abundantly.

P. cocomilia is characterized by great variability of leaves. Their length varies from several millimeters to 5 cm; the variability is especially marked on strongly grazed specimens. The information on the occurrence of *P. spinosa* on Chios most probably refers to *P. cocomilia* (Rechinger 1943) (Fig. 4 and 104).

NE slopes of Kouvalas Mt., between Kardamila and Pityous, 350-400 m alt. frequent, strongly grazed, BBZ 31; N slopes of Pelinaion Mt, frequent between 500-800 m, grazed shrubs and small trees, BBZ 44; W slopes of Amani Mt, the climb from Melanios, degraded pastures, rare, BBZ 120; W slopes of Amani Mt., above Agion Gala, BBZ 122; W slopes of Amani Mt. above Melanios, frequent, BBZ 123.

91. *Pyrus spinosa* Forsskal

The species is common everywhere, especially along roads (escarps), at edges of olive plantations, in the valleys of rivers and stream, in open maquis or in phrygana (Fig. 105).

W slopes of Amani Mt., the climb from Agion Gala, common in places, BBZ 126; On the wayside between Agios Georgios Sykousis and the cross-road toward Anavatos and Lithi, BBZ 210.

92. *Rosa agrestis* Savi

This is a new species for the flora of Chios. We found it only on the northern slopes of Pelinaion and at the base of this massif in village Kampia. The nearest localities are known from Lesvos Is. and western Anatolia (Fig. 106).

N slopes of Pelinaion Mt., open rocky places, very rare, strongly grazed, ca 500 m alt.; Kampia, thickets on the edge of field, not far from the road from Kampia to Spartounta, BBZ 76.

93. *Rosa canina* L.

This species is scattered in the lower regions of the island, in road side thickets, in valleys of streams and at edges of orchards, etc. (Fig. 107).

1-3 km NE of Marmaron, loose thickets along the road from Marmaron to Agia Irini, 20-40 m alt., BBZ 8; N slopes of Pelinaion Mt., scattered in thickets, ca 400 m alt., BBZ 50; wayside thickets between Chalanda and Afrodisia, N of Volissos, BBZ 143; Wayside thickets between Agios Joannis and Vounos, BBZ 218.

94. *Rosa phoenicia* Boiss.

This is a new species for the flora of Chios. We found it only once in the central part of the island. The nearest occurrence is in coastal western Anatolia and on the islands Kos and Rodhos (Fig. 108).

Karyes, on the high escarpment near the way to Nea Moni., BBZ 110.

95. *Rosa pulverulenta* M. Bieb.

Syn.: *R. glutinosa* Sibth. et Sm.

It grows only in the two massifs — Pelinaion and Oros, above 500 - 600 m up to the highest places, sometimes in masses as prostrate, small, 10 - 15 cm tall shrub. The species is very variable both in terms of prickles on stems, glands on leaves and the colour of flowers.

The informations on the occurrence of *R. horrida* Fischer on Chios refer to *R. pulverulenta* (Rehinger 1943) (Fig. 109).

N slope of Pelinaion Mt., open rocky places, 600-800 m small, creeping shrub, grazed, BBZ 58, 63; Pelinaion Mt., climb from Kampia, rocky places, among loose thickets, BBZ 152; N slope of Oros Mt., climb from Kardamila, rocky open places, 500-750 m, frequent, BBZ 185, 190, 193.

96. *Rosa sempervirens* L.

The localities of this evergreen rose are not numerous but abundant, known only in northern and south-eastern parts of the island, where it grows in rather moist and compact thickets (Fig. 110).

Vikion, frequent in wayside thickets, BBZ 81; Between Agios Joannis and Vounos, the valley of a dried stream, very frequent, BBZ 219.

97. *Rubus ulmifolius* Schott

This species is common in the lower regions on the whole island, especially on moist sites — in valleys of streams, along roadside ditches, etc. In north-west Chios it is almost exclusively represented by a form with small leaflets (Fig. 111).

1-3 km NE of Marmaron, loose thickets along the road from Marmaron to Agia Irini, 20-40 m alt., BBZ 7; W slope of Amani Mt., common in the stream valley above Agia Gala, small-leaved forms, BBZ 130.

98. *Sarcopoterium spinosum* (L.) Spach

This is one of the commonest species of shrubs in the island, occurring from the sea-level up to 500 (—700) m. It is the main component of phrygana, especially a degraded one (Fig. 112).

Marmaron, the edge of the olive orchard, very frequent, BBZ 179.

RUBIACEAE

99. *Rubia tenuifolia* Urv.

This delicate climbing shrub is scattered over the lower parts of the whole island but mainly in the South. It grows in thickets of maquis (Fig. 113).

1-3 km NE of Marmaron, loose wayside thickets along the way from Marmaron to Agia Irini, 20-40 m alt., BBZ 24; Kampia, wayside thickets, BBZ 124.

RUTACEAE

100. *Ruta chalepensis* L.

It grows in Chios on three, rather poor stands in the northern part of the island. Previously it was collected here only by Platt (Meikle 1954) in Hagios Constantinos, but unfortunately we could not locate this place (Fig. 114).

Agion Gala, rocky hillsides near the village, rare, BBZ 131.

SANTALACEAE

101. *Osyris alba* L.

It is distributed almost throughout the island, on the dry and isolated places — roadside escarps, waste lands, more or less destroyed maquis and phrygana (Fig. 115).

1-3 km NE of Marmaron, thickets near the road to Agia Irini, BBZ 1.

SOLANACEAE

102. *Lycium europaeum* L.

This is a new species for the flora of Chios, growing only on four stands. The most abundant groups of this species we observed in ruderal

sites near buildings. The nearest locality is known from western Anatolia, province Izmir (Fig. 116).

Giosnas NW of Kardamila, ruderal places not far from the beach, BBZ 37; Ca 1 km NW of Volissos, wayside not far from a river, rare, BBZ 145; Ruderal places among buildings between Chios and Vrondados, rare, BBZ 198; Agios Georgios Sykousis, a slope below the cemetery, BBZ 203; Agios Georgios Sykousis, sunny places on slopes just below the village, BBZ 205.

TAMARICACEAE

103. *Tamarix parviflora* DC.

This is a new species for the flora of Chios. We found it only in one place in the southern part of the island, where it is very abundant. In the neighbourhood it grows on Samos Is. and in western Anatolia, province Izmir (Fig. 117).

Komi, banks of river and along the beach, frequent, BBZ 102 (det. B. R. Baum).

104. *Tamarix smyrnensis* Bunge

This is a new species for the flora of Chios. We observed it only in one but abundant place in the eastern part of the island. The nearest localities are mentioned from western Anatolia, in the region of Izmir (Fig. 118).

Agia Markella, W of Volissos, open sandy places not far from the beach, BBZ 139 (det. B. R. Baum).

THYMELAEACEAE

105. *Thymelaea tartonraira* (L.) All.

It occurs on the scattered stands in the southern part of the island, usually in the phrygana. It is represented here by only one subspecies — subsp. *argentea* (Sm.) Holmboe with two varieties — var. *argentea* and var. *linearifolia* K. Tan; the latter is dominant (Fig. 119).

Ca 2 km before Pirgi, along the road from Armolia, remnants of maquis, BBZ 89; Wayside thickets between Kalamoti and Emporia, scattered, BBZ 105; In thickets along the way between Agios Georgios and the cross-road toward Anavatos and Lithi, BBZ 212.

ULMACEAE

106. *Celtis australis* L.

This is a new species for the flora of Chios. We found only one small tree of this species in thickets at the edge of a field near Talopotamion. It is not unlikely that this locality has only an atropogenic character, though nearby *Celtis australis* is represented on Lesvos Is. and in western Anatolia (Fig. 120).

VERBENACEAE

107. *Vitex agnus-castus* L.

This species is common throughout the island, except the highest places. It grows in at least periodically moist sites, in valleys of streams, along roadside ditches, etc. (Fig. 121).

Agia Markella, W of Volissos, thickets along the beach, BBZ 133.

VITACEAE

108. *Vitis sylvestris* C. C. Gmelin

This is a new species for the flora of Chios. We observed it in the southern part of the island on only two stands, in roadside thickets of maquis. The nearest localities are known from western Anatolia (Fig. 122).

The edge of maquis between Pirgi and Agia Pandes, BBZ 113.

SUMMARY

In the year 1985, from May 11th to June 2nd, floristic studies were being conducted on Chios Is. devoted to the woody flora of the island. Basing on own herbarium collections and field notes, on materials originating from several European herbaria and also on data from literature, it was established that on Chios there grow in the wild state 108 species of trees and shrubs, of which 6 are Gymnosperms, and 102 Angiosperms. They belong to 42 families and 80 genera. Richest in the number of species are the families *Leguminosae* (15), *Rosaceae* (13), *Labiatae* (12), *Cistaceae* (8), and the richest genera are *Rosa* with 5 species and *Astragalus* with 4.

It turned out also that compared with the only available listing of Chios flora so far (Meikle 1954) as many as 32 species are new for the island, first discovered by us. Some constitute a true surprise from the point of view of plant geography as for example *Amelanchier parviflora* Boiss., *Ribes orientale* Desf., *Polygonum icaricum* Rech. f., *Genista anatolica* Boiss., *Sueda vera* J. F. Gmelin, *Atriplex halimus* L., *Phlomis cretica* C. Presl. and *Teucrium brevifolium* Schreber. We were unable to find 4 species mentioned by Meikle, namely *Astragalus ptilodes* Boiss., *Clematis flammula* L., *Fumana procumbens* (Dunal) Gren. et Godron and *Helianthemum lavandulifolium* Miller.

The authors give in alphabetical order (by families and genera) a list of all species of trees and shrubs on Chios. Besides a short characteristic of their occurrence on the island, they have prepared also point maps of distribution of the plants on Chios. When discussing individual species own herbarium materials are quoted. Besides the authors have character-

rized the most important communities of trees and shrubs on the island — forests (mainly pine — *Pinus brutia* Ten.), maquis, phrygana and high altitude thickets. They inform also about the presence of introduced trees and shrubs both ornamental and fruiting ones. Of particular interest are numerous specimens of different age of *Morus nigra* L. and plantations of mastic-trees (*Pistacia lentiscus* L. cv. *Chia* which are cultivated in the south of the island for the production of a gum-like resin known as mastic.

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Flora drzew i krzewów Chiosu

Streszczenie

W roku 1985, od 11 maja do 2 czerwca prowadzone były na Chiosie badania florystyczne poświęcone drzewiastej florzce tej wyspy. Opierając się na własnych zbiorach zielnikowych i notatkach terenowych, na materiałach pochodzących z kilku zielników europejskich, a także na danych z literatury ustalono, że na Chiosie roślinie w dzikim stanie 108 gatunków drzew i krzewów, z czego na *Gymnospermae* przypada 6 gatunków, a na *Angiospermae* 102. Należą one do 42 rodzin i 80 rodza-

жов. Najbogatszymi pod względem liczby gatunków są następujące rodziny: *Leguminosae* 15, *Rosaceae* 13, *Labiatae* 12, *Cistaceae* — 8, a najbogatszymi rodzajami: *Rosa* — 5 gatunków i *Astragalus* — 4. Okazało się także, że w porównaniu z jedynym jak dotąd zestawem flory Chiosu (Meikle 1954) aż 32 taksony są nowymi dla tej flory, odkrytymi przez autorów. Niektóre z nich stanowią prawdziwą rewelację z punktu widzenia geografii roślin, jak np.: *Amelanchier parviflora* Boiss., *Ribes orientale* Desf., *Polygonum icaricum* Rech. f., *Genista anatolica* Boiss., *Sueda vera* J. F. Gmelin, *Atriplex halimus* L., *Phlomis cretica* C. Presl. i *Teucrium brevifolium* Schreber. Nie udało się natomiast odnaleźć czterech gatunków wymienionych przez Meikle'a, a mianowicie: *Astragalus ptilodes* Boiss., *Clematis flammula* L., *Fumana procumbens* (Dunal) Gren. et Godron i *Helianthemum lavandulifolium* Miller.

Autorzy podają w układzie alfabetycznym (rodzinami i rodzajami) zestaw wszystkich gatunków drzew i krzewów Chiosu. Oprócz krótkiej charakterystyki występowania ich na wyspie opracowali także punktowe mapy ich rozmieszczenia; przy omówieniu poszczególnych gatunków cytowane są własne okazy zielnikowe. Ponadto autorzy scharakteryzowali najważniejsze zbiorowiska drzew i krzewów wyspy — lasy (głównie sosnowe — *Pinus brutia* Ten.), makia, frygana i wysokogórskie zarośla. Informują również o obecności drzew i krzewów introdukowanych, zarówno ozdobnych, jak i owocowych. Na szczególną uwagę zasługują liczne, różnowiekowe okazy *Morus nigra* L. oraz plantacje pistacjowe (*Pistacia lentiscus* L. cv. *Chia* zakładane na południu wyspy dla produkcji gumowatej żywicy zwanej mastyksem).

Флора деревьев и кустарников острова Хиос*

Резюме

В 1985 году, с 11 мая по 2 июня, были проведены на Хиосе флористические исследования посвященные древесной флоре этого острова. Опираясь на собственных гербарных материалах, полевых заметках и материалах из нескольких европейских гербариев, а также на литературных данных установлено, что на Хиосе растет в диком виде 108 видов деревьев и кустарников, из чего на *Gymnospermae* приходится 6 видов, а на *Angiospermae* — 102. Они принадлежат к 42 семействам и 80 родам. Наиболее богатыми по числу видов являются следующие семейства: *Leguminosae* 15, *Rosaceae* 13, *Labiatae* 12, *Cistaceae* 8, а наиболее богатыми родами: *Rosa* — 5 видов и *Astragalus* — 4. Оказалось также, что по сравнению с единственным по сих пор описанием флоры Хиоса (Meikle 1954) 32 таксона являются новыми для этой флоры, открытыми авторами. Некоторые из них это настоящая сенсация с точки зрения географии растений, например: *Amelanchier parviflora* Boiss., *Ribes orientale* Desf., *Polygonum icaricum* Rech. f., *Genista anatolica* Boiss., *Sueda vera* J. F. Gmelin, *Atriplex halimus* L., *Phlomis cretica* C. Presl. и *Teucrium brevifolium* Schreber. Не удалось однако, найти четырех видов описанных Meikle таких как: *Astragalus ptilodes* Boiss., *Clematis flammula* L., *Fumana procumbens* (Dunal) Gren. et Godron и *Helianthemum lavandulifolium* Miller.

Авторы подают в алфавитном порядке (семействами и родами) список всех видов деревьев и кустарников Хиоса. Кроме краткой характеристики их местообитаний на острове разработали также точечную карту из размещения. При описании отдельных видов приводятся собственные гербарные материалы.

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Кроме того авторы охарактеризовали наиболее важные ассоциации деревьев и кустарников острова — леса (главным образом сосновые — *Pinus brutia* Ten.), макию и фрегату и высокогорные заросли. Даны также сведения о наличии интродуцированных деревьев и кустарников, как декоративны, так и плодовых. Особенного внимания заслуживают многочисленные разновозрастные экземпляры *Morus nigra* L., а также плантации мастикового дерева (*Pistacia lentiscus* L. cv. *Chia* заложенные на юге острова для продукции живичной мастики.