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Distribution of *Liquidambar orientalis* Miller on Rodhos Island

L. orientalis has been described by Miller about 1768 „from garden material originating from the Levant” (Peşmen 1972). It is closely related to the North American *L. styraciflua* L. from which it differs only slightly in having nearly always glabrous leaves on the dorsal side, a more rounded crown and poorer growth.

This is a species with a small range covering mainly the southern Anatolian provinces Aydin, Mugla, Antalya and Hatay. It grows also on Rodhos and on Cyprus. On the latter island however it is only introduced in the vicinity of monasteries (Chapman 1949). The systematic position of Cyprian specimens is still not sufficiently clear and sometimes they are considered to be *L. styraciflua* (Holmboe 1914, Meikle 1977). In Turkey *L. orientalis* grows on sites typical for the species along rivers and streams and along the sea coast itself where it forms its own communities, or occurs together with *Platanus orientalis*, *Alnus orientalis*, *Ulmus minor*, *Smilax excelsa* and *Vitis sylvestris*. It can be also found, though much more rarely on drier slopes of river valleys in forests of *Pinus brutia* (Browicz 1982).

The occurrence of *L. orientalis* on Rodhos Island has been first reported by Fiori in 1924 (after Reching er 1943). At the time he knew only two stands, "Convento d'Iskiati", which however was not found to exist, and "zwischen Alaerma und Apollona am Flusse Gaduras". Next in 1934 Ladispoto has found it in Peveragno (Petaloudes) and in 1935 it was also found by Reching er (after Reching er l.d. Finkl 1961/62) and in 1965 by Davis (in sched) near Salakos. In May 1983 during our stay on the island we have had the opportunity to visit these places which has enabled us to characterize them better. We were also able to find two new stands between Archangelos and Malona and NE Salakos. All these stands have been marked on the map by consecutive numbers according to the sequence discussed in the text (Fig. 1).

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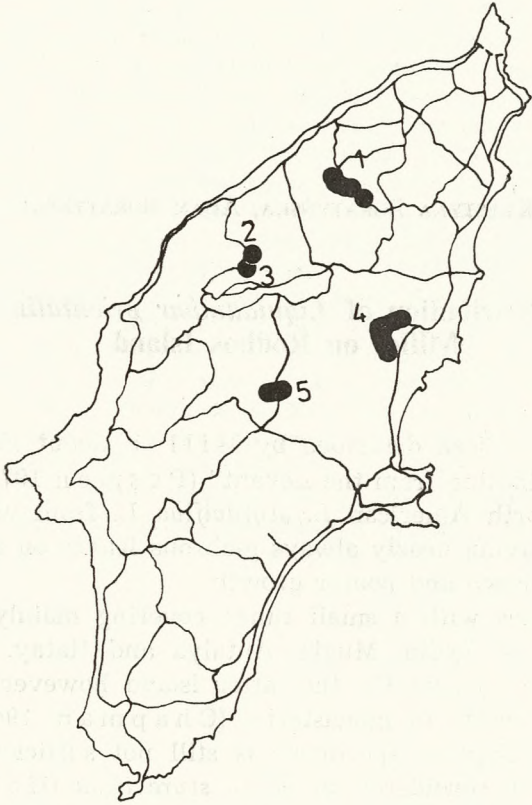


Fig. 1. Distribution *L. orientalis* on Rodhos

1. Petaloudes near Kalamonas (Valley of the Butterflies). This is the most commonly visited stand of *L. orientalis* on Rodhos which is most probably associated with its great touristic attractiveness, the massive appearance of colourfull butterflies, and as a result it is from here that the most numerous herbarium specimens originate. Several hundred specimens of the species grow there along a rapid stream, forming a loose wood situated primarily on the northern slope of the valley (Fig. 2). The majority of specimens attain 10 - 18 m in height and stem girth of 100 - 200 cm at the base, and the largest tree was slightly more than 20 m tall and 300 cm in girth (Fig. 3, 4). We have found there both seedlings and numerous sprouts from stumps and from roots. It appears that the majority of trees existing there now are of coppice origin. Directly in the stream itself or on its banks near *L. orientalis* there occur only *Platanus orientalis*, while on the slope of the valley there occur also *Myrtus communis*, *Styrax officinalis*, and singly *Phillyrea latifolia*, *Rhamnus alaternus*, *Pistacia lentiscus*, *Quercus coccifera* and *Laurus nobilis*.

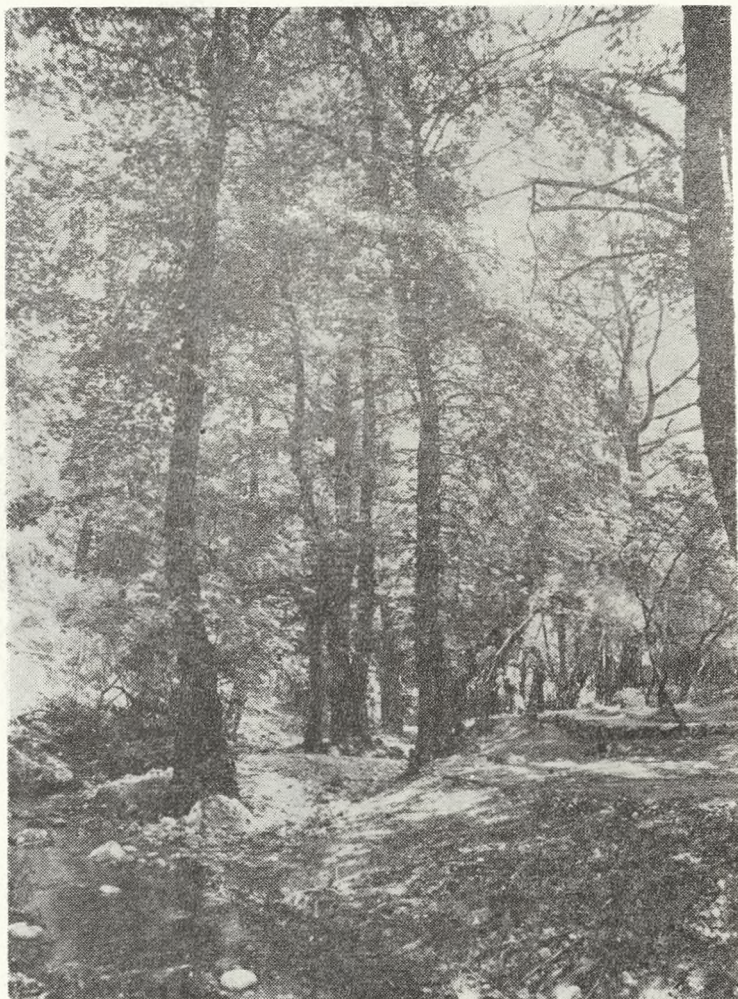


Fig. 2. Fragment of *Liquidambar orientalis* forest in Valley of the Butterflies near Kalamonas. Phot. A. Boratyński

2. About 1.5 - 2 km NE of village Salakos, on a small stream there grow small young trees of *L. orientalis* forming compact groups; their height as a rule does not exceed 6 - 7 m. They are accompanied by *Myrtus communis*, *Platanus orientalis*, *Salix alba*, *Rhamnus alaternus*, *Pistacia lentiscus*, *Quercus coccifera*, *Q. pubescens*, *Vitex agnus-castus* and also *Smilax aspera*, *Osyris alba*, *Hypericum hircinum* and *Hedera helix*.

3. Slightly southeast of Salakos, in its direct vicinity, at the feet of Profitis Ilias there grow on a small river several trees of this species 8 - 10 m tall forming small clumps. This is probably the place visited by Davis in 1965.

4. More or less mid-way between Archangelos and Malona on stream

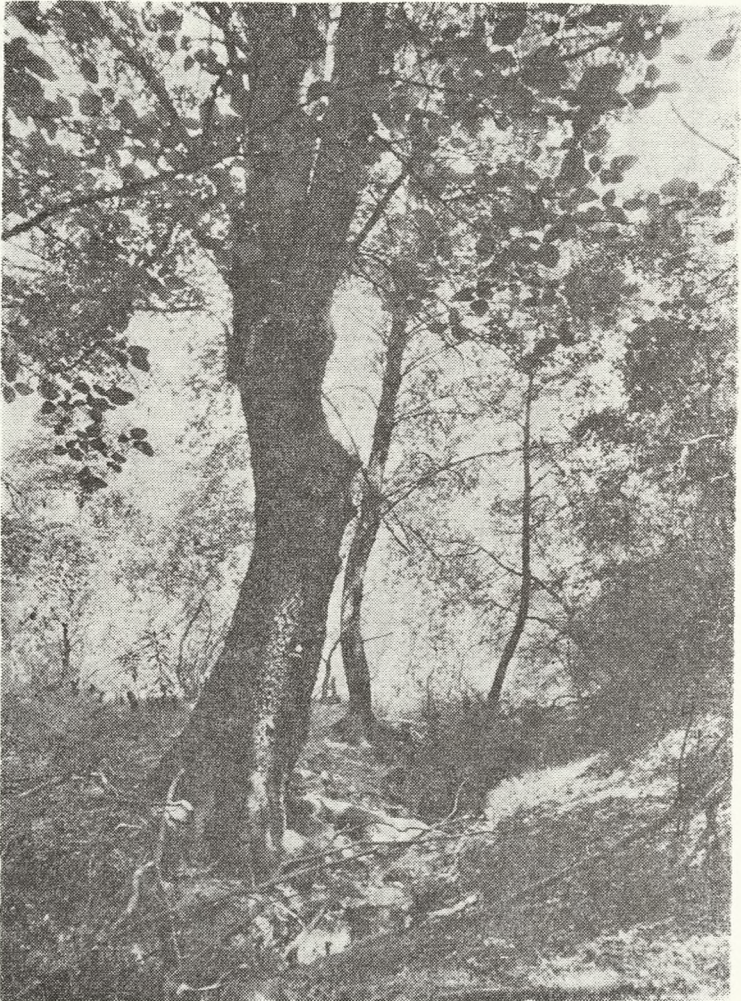


Fig. 3. Valley of the Butterflies, one of the tallest species of *Liquidambar orientalis*. Phot. A. Boratyński

flowing along the road there extend rich communities of trees and shrubs with an abundant participation of *L. orientalis*, which is represented here by several dozen prominent trees. The tallest one was slightly more than 20 - 22 m in height and at breast height 280 - 290 cm in girth (Fig. 5). The bark of these trees is exceptionally thick and much fissured resembling our oaks and maples. Here *L. orientalis* is accompanied by *Platanus orientalis*, *Salix alba*, *Hypericum hircinum* (very numerous), *Styrax officinalis*, *Similax aspera* and single specimens of *Quercus coccifera*. Somewhat further away from the road in the southerly direction all the way to Malona itself, we have found along a stream other numerous specimens of *L. orientalis*, though not so spec-



Fig. 4. The old trees of *Liquidambar orientalis* in Valley of the Butterflies. Phot. A. Boratyński

tacular in size as those to the North. Furthermore the species also frequently grows along watering dikes for orange orchards northwest of Malona.

5. Near the road between Laerma and Apollona, on both sides of the road, on the banks of river Gadouras (Gaduras) *L. orientalis* forms its own extensive communities. Mainly however these are young not large trees, more or less 10 m tall. Single somewhat larger specimens grow higher up on the valley slope. All older specimens fructify abundantly. One can also see an abundant natural regeneration which most commonly appears on the stony banks of the river (Fig. 6). Besides *L. orientalis* one can find here also *Platanus orientalis*, *Vitex agnus-ca-*



Fig. 5. One of the tallest trees of *Liquidambar orientalis* between Archangelos and Malona, 20 - 22 m and a stem girth of 280 - 290 cm. Phot. A. Boratyński

stus, *Nerium oleander*, *Hypericum empetrifolium*, *H. hircinum*, *Erica manipuliflora*, *Lavandula stoechas*, *Salvia triloba*, *Anthyllis hermanniae*, *Satureja thymbra*, *Spartium junceum*, *Genista acanthoclada*, *Quercus coccifera*, *Pistacia lentiscus*, *Myrtus communis*, *Styrax officinalis*, *Salix alba*, *Cistus incanus*, *C. salvifolius*, *C. parviflorus* and further up the slope also *Cupressus sempervirens* and *Pinus brutia*.

As can be seen from the above *L. orientalis* belongs to rare species on Rhodos Island and so far is only known from 5 localities. It always grows along rivers and streams that do not dry for the summer. It occurs as a rule on relatively small elevations, usually between 100 and 280 m, rarely exceeding 300 m, while in Anatolia it attains 500 m or

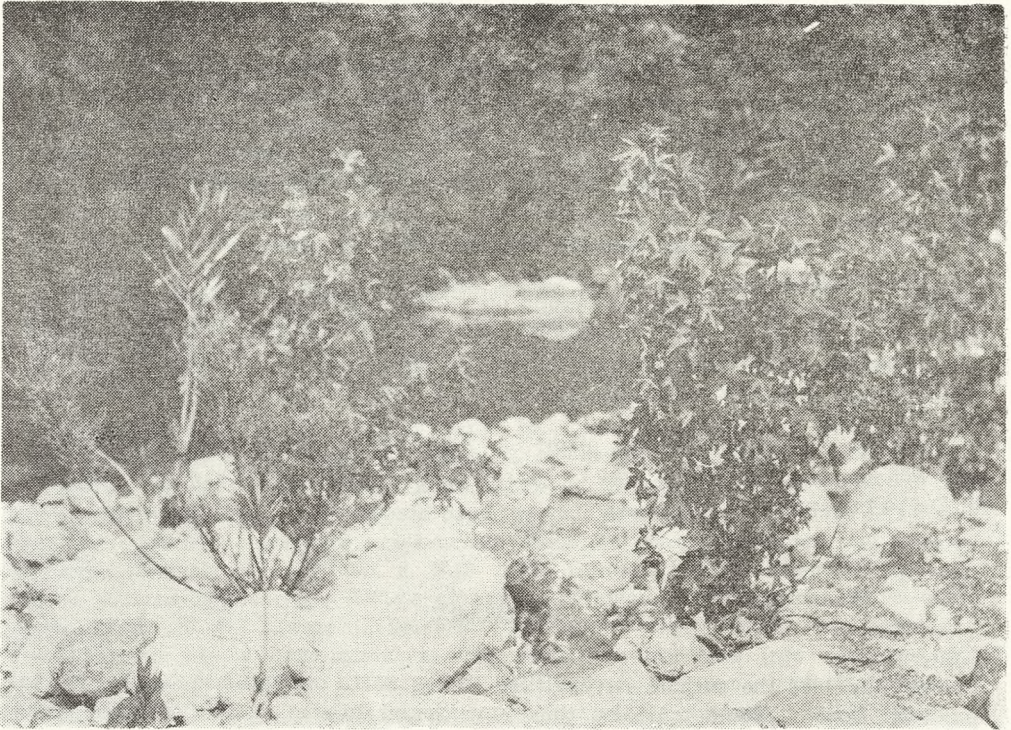


Fig. 6. Natural regeneration of *Liquidambar orientalis* on the stony banks of Gadouras river. Phot. A. Boratyński

even 800 m. Almost inseparably it is accompanied by *Platanus orientalis* and also, though to a smaller degree by *Vitex agnus-castus*, *Styrax officinalis*, *Myrtus communis* and *Salix alba*.

L. orientalis is a very decorative species, primarily in view of its nice leaf colour in the autumn. The balsam which is obtained by incising its bark finds a use in medicine as a pain-killer. Particularly large amounts of the balsam are being exported from Turkey to western Europe and USA. In Rodhos island, in view of the limited number of trees growing there such utilisation of the species is unknown. Also the balsam is used in local religious ceremonies as an incense (eg. on Cyprus).

In view of the scarcity of *L. orientalis* occurrence on Rodhos the tree deserves to be placed under complete protection as a species. Currently only in one place, namely in Petaloudes, *L. orientalis* is protected within a nature reserve. A similar protection should be organised for the other four stands and especially for the stands between Malona and Archangelos, which in floristic and landscape terms appears to be the most interesting.

LOCALITIES

Herbarium specimens: Peveragno, secus rivulum „Pelicano”, 150 m, 4.7.1935, Rechinger 8550 (E, JE, K); Petaloudes, 17.4.1965, Skovsted (C); Petaloudes, guelly, 5.1967; Hooper (K); Valley of Petaloudes, 130 - 150 m, by the river, gregarious, 3.4.1973, Stamatiadou 16462 (GK); Salakos, 200 m, hedges near stream. small tree planted, 24.3.1965, Davis 40317 (E); Salakos, SE of village on a stream, 25.5.1983; K. Boratyńska, A. Boratyński, K. Browicz, J. Dolatowski, 15(KOR); between Malona and Archangelos, on stream 16.5.1983, K. Boratyńska, A. Boratyński, K. Browicz, J. Dolatowski, 164 (KOR); 4 km N of Laerma to Apollona on a river Gadouras, 21.5.1983, K. Boratyńska, A. Boratyński, K. Browicz, J. Dolatowski, 199 (KOR); Valley of Butterflies (Petaloudes) between Kalamon and Psinthos, 19.5.1983, K. Boratyńska, A. Boratyński, K. Browicz, J. Dolatowski, 183a (KOR).

Observations: Salakos, about 1,5 - 2 km NE of village, on a small stream, 180 - 230 m alt., 26.5.1983, K. Boratyńska, A. Boratyński, K. Browicz, J. Dolatowski.

SUMMARY

In May 1983 the authors have visited stands of *L. orientalis* known so far to exist on Rodhos Island and also they have found two more. All of these were numbered on the map and consecutively described in the text. They are 1. Petaloudes (Valley of Butterflies), 2. Salakos, about 1,5 - 2 km northwest of the village, 3. Southeast of Salakos, 4. Between Archangelos and Malona and 5. On Gadouras river. On Rodhos Island *L. orientalis* always grows along rivers or streams that do not dry for the summer. It is accompanied there by *Platanus orientalis* and also by *Vitex agnus-castus*, *Styrax officinalis*, *Myrtus communis* and *Salix alba*. This species is protected in a nature reserve only in Petaloudes. The remaining stands also deserve protection in view of the rarity of *L. orientalis* on this island.

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Rozmieszczenie Liquidambar orientalis Miller na wyspie Rodos

Streszczenie

W maju 1983 roku autorzy odwiedzili znane do tej pory stanowiska *L. orientalis* na wyspie Rodos, jak i odnaleźli dwa nowe. Wszystkie oznaczone zostały kolejnymi numerami na mapie i według tej kolejności omówione w tekście. Są to następujące stanowiska: 1. Petaloudes (Valley of Butterflies) — rośnie tam kilkaset okazów *L. orientalis* tworząc luźny lassek; najpotężniejsze przekraczały nieco 20 m wysokości i 300 cm obwodu pnia. 2. Około 1,5-2 km na północny wschód od wsi Salakos — zwarte grupy młodych okazów *L. orientalis* o wysokości 6-7 m. 3. Na południowy wschód od Salakos — kilka drzew *L. orientalis* o wysokości 8-10 m tworzą niewielkie kępy. 4 W połowie drogi między Archangelos i Malona — liczne okazy *L. orientalis*, najwyższe przekraczały nieco 20-22 m wysokości i w obwodzie pnia mierzyły 280-290 cm. 5. Nad rzeką Gadouras — *L. orientalis* tworzy własne, rozległe zbiorowiska złożone głównie z młodych, niedużych okazów o wysokości około 10 m. Zawsze *L. orientalis* na wyspie Rodos rośnie nad rzekami i strumieniami nie wysychającymi w ciągu lata. Nieodłącznym jego towarzyszem jest tam *Platanus orientalis*, a także *Vitex agnus-castus*, *Styrax officinalis*, *Myrtus communis* i *Salix alba*. Gatunek objęty jest ochroną rezerwatową tylko w Petaloudes. Na podobną ochronę zasługują pozostałe stanowiska już choćby tylko z uwagi na rzadkość występowania *L. orientalis* na wyspie Rodos.

Размещение Liquidambar orientalis Miller на острове Родос

Резюме

В мае 1983 года авторы посетили известное до этих пор местообитание *L. orientalis* на острове Родос и нашли два новых. Они все обозначены порядковыми номерами на карте и в этом порядке описаны в тексте. Это следующие местообитания: 1. Петалудес (Valley of Butterflies) — растет там несколько сот особей *L. orientalis* образует редкий лесок, самые массивные деревья немногим превышают 20 м высоты и 300 см окружности ствола. 2. Około 1,5-2 km на северо-восток от деревни Салакос — сомкнутые группы молодых деревьев *L. orientalis* высотой 6-7 м. 3. На юго-востоке от Салакос несколько деревьев *L. orientalis* высотой 8-10 м образуют небольшие группы. 4. Примерно в половине дороги между Архангелос и Малоной — многочисленные особи деревьев *L. orientalis*, самые высокие из них немного превышают 20-22 м высоты, а в окружности доходили до 280-290 см. 5. Вдоль реки Гадурас — *L. orientalis* образует обширные группы составленные главным образом из молодых небольших деревьев высотой около 10 м. На острове Родос *L. orientalis* растет всегда вдоль рек и потоков не высыхающих в течение лета. Почти всегда ему сопутствуют *Platanus orientalis*, а также *Vitex agnus-castus*, *Styrax officinalis*, *Myrtus communis* и *Salix alba*. *L. orientalis* обьят заповедной охраной только в Петалудес. На подобную охрану заслуживают остальные местообитания этого вида хотя бы из-за редкости его встречаемости на острове.