

DELIMITATION OF *ORIGANUM SCABRUM* BOISS. ET HELDR. (LABIATAE) BY MEANS OF MORPHOLOGICAL CRITERIA

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SUMMARY

A morphological study was made of two taxa in the group *Amaracus* of the genus *Origanum* L. (*Labiatae*): *O. scabrum* and *O. pulchrum*. Boissier & Heldreich described these taxa as species, respectively in 1846 and 1859. The present study shows that they are in every respect identical and have to be united into one species, under the name *Origanum scabrum* Boiss. et Heldr.

1. INTRODUCTION

Some years ago the first author started a taxonomic revision of the genus *Origanum*. Within the framework of this revision the systematic position of *O. scabrum* Boiss. et Heldr. and *O. pulchrum* Boiss. et Heldr. was studied.

Several authors (e.g. BOISSIER 1879) conceived the genus *Origanum* in a broad sense, as LINNAEUS (1754) originally did, and divided the genus into three groups. Others (e.g. BRIQUET in ENGLER & PRANTL 1897) considered these groups to be separate genera. For the time being we prefer the first conception. The taxa studied belong to the group *Amaracus* which is characterised by the presence of large coloured bracts. Furthermore the two-lipped calyx is obvious.

Table 1. Differences between the taxa *O. scabrum* and *O. pulchrum* as given by Boissier.

character	<i>O. scabrum</i>	<i>O. pulchrum</i>
stem, length	up to 45 cm	up to 30 cm
spike bearing side-branch, relative length	short	longer
leaf, shape	ovate, top acute	ovate, top obtuse
leaf, length	up to 25 mm	up to 18 mm
leaf, hairiness	margin rough with short, stiff hairs	margin smooth
bract, shape	ovate, top acute	ovate, top more or less obtuse
calyx, relative length lips	upper lip much longer than lower lip	upper lip slightly or not longer than lower lip
calyx, relative length teeth upper lip	upper lip divided up to 1/3 into 3 teeth	upper lip divided up to 1/2 into 3 teeth
calyx, venation	longitudinal veins elevated	longitudinal veins not elevated

O. scabrum was described by BOISSIER & HELDREICH (in BOISSIER 1846) from Mt. Taygetos in Southern Greece. In addition BOISSIER & HELDREICH (in BOISSIER 1859) described *O. pulchrum* from Mt. Delphi on the island Euboa. Orphanides discovered a second station for both taxa, respectively in 1850 on Mt. Malevo for *O. scabrum* and in 1871 on Mt. Kandilion for *O. pulchrum*.

The differences between these taxa were formulated by BOISSIER twice, first (together with Heldreich) in the original descriptions (1846, 1859) and secondly in the *Flora Orientalis* (1879). In table 1 these differences are summarized.

2. MATERIAL AND OBSERVATIONS

Boissier has given clear criteria for distinguishing *O. scabrum* from *O. pulchrum*. During the study of some herbarium material, however, we found that the differences between the taxa were not at all as obvious as formulated. It was not even clear whether there was any feature characteristic of one taxon only.

To solve this problem it is necessary to consider the two taxa at the population level. For this reason the second author made a collecting trip to Greece in June and July of 1969.

Fig. 1. Length (on the Y-axes) of (a) the lower part of the calyx (tube + lower lip), (b) the tube, (c) the lateral teeth of the upper lip and (d) the lower lip of the calyx, relative to the total length of the calyx (on the X-axes), for four populations of the taxa *O. scabrum* and *O. pulchrum*. All dimensions are given in mm. The data concern five specimens from Mt. Malevo and ten specimens from each of the other three populations.

- △ Mt. Taygetos
- ▲ Mt. Malevo
- Mt. Kandilion
- Mt. Delphi

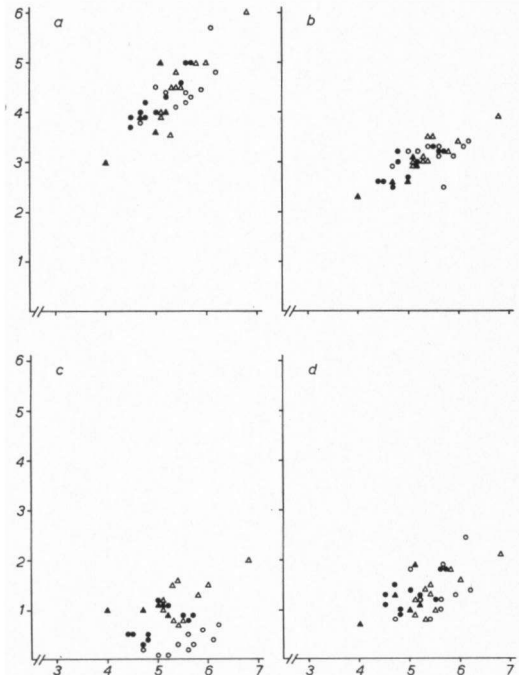


Table 2. Survey of some morphological characters for the four populations of *O. scabrum* and *O. pulchrum*. The characters with an x are those used by Boissier as criteria for distinguishing the two taxa as species (see table 1). All dimensions are given in mm except the lengths of hairs, which are given in μ . For each character an average value is given and also, between brackets, the variation.

	O. scabrum			O. pulchrum	
	Mt. Taygetos	Mt. Malevo	Mt. Kandilion	Mt. Delphi	Mt. Delphi
stem, length ^x	280(130-450)	240(80-360)	230(70-350)	220(50-330)	
spike bearing side-branch, length ^x	24(10-45)	20(10-30)	23(4-30)	15(5-60)	
leaf, shape ^x	heart-shaped to suborbicular; top acute or obtuse	heart-shaped to suborbicular; top acute or obtuse	heart-shaped to suborbicular; top acute or obtuse	heart-shaped to suborbicular; top acute or obtuse	heart-shaped to suborbicular; top acute or obtuse
leaf, length ^x	21(7-29)	18(7-27)	17(12-35)	17(5-28)	17(5-28)
leaf, width	15(3-14)	13(5-20)	12(9-22)	14(3-19)	14(3-19)
leaf, number of hairs on margin ^x	210(150-320)	150(80-200)	100(50-175)	110(50-175)	110(50-175)
leaf, length of hairs ^x	100(80-150)	80(60-120)	210(200-240)	90(60-100)	90(60-100)
spike, length	19(10-25)	17(14-18)	16(10-18)	18(12-20)	
spike, width	14(10-15)	15(14-15)	13(10-17)	14(10-16)	
bract, shape ^x	heart-shaped to ovate; top acuminate to acute	heart-shaped to ovate; top acuminate to acute	heart-shaped to ovate; top acuminate to acute	heart-shaped to ovate; top acuminate to acute	heart-shaped to ovate; top acuminate to acute
bract, length	11(9-13)	9(8-10)	10(7-12)	10(8-12)	10(8-12)
bract, width	8(7-9)	6(5-7)	7(5-10)	7(5-9)	7(5-9)
calyx, length	5.5(4.7-6.8)	4.8(4.0-5.2)	5.8(5.0-6.7)	5.0(3.9-5.6)	5.0(3.9-5.6)
calyx, length upper lip	2.4(2.0-3.1)	2.1(1.7-2.4)	2.6(1.8-3.8)	2.1(1.6-2.5)	2.1(1.6-2.5)
calyx, length middle tooth upper lip ^x	0.9(0.2-1.9)	0.9(0.5-1.1)	0.7(0.2-1.2)	0.8(0.3-1.2)	0.8(0.3-1.2)
calyx, length lateral teeth upper lip ^x	1.4(0.7-2.5)	1.0(0.9-1.1)	0.4(0.1-1.2)	0.7(0.3-1.5)	0.7(0.3-1.5)
calyx, length teeth lower lip ^x	1.4(0.7-2.3)	1.2(0.7-0.9)	1.5(0.6-2.4)	1.3(0.6-1.8)	1.3(0.6-1.8)
calyx, venation ^x	longitudinal veins slightly elevated	longitudinal veins slightly elevated	longitudinal veins slightly elevated	longitudinal veins slightly elevated	longitudinal veins slightly elevated
corolla, length	11.9(10.0-13.6)	11.0(9.5-13.0)	10.0(7.5-12.6)	10.4(8.4-12.2)	10.4(8.4-12.2)
corolla, length upper lip	3.8(3.0-4.8)	5.1(2.3-4.1)	3.7(2.5-4.6)	3.5(2.9-4.4)	3.5(2.9-4.4)
corolla, length lower lip	3.3(2.4-4.0)	2.7(1.8-3.0)	3.2(2.1-4.0)	3.1(2.3-4.3)	3.1(2.3-4.3)

He collected many specimens of both taxa on Mt. Delphi (including Mt. Xerowouni), Mt. Kandilion and Mt. Taygetos. At all localities, covering the whole distribution area, also data about substratum and ecology were gathered.

The data in this and the following paragraphs are based on own observations and collections, while also material received on loan from several other herbaria has been studied. The data concerning Mt. Malevo are based on herbarium material only.

From the populations of each of the four mountains twenty plants were measured, except for Mt. Malevo, for which this number is five. *Table 2* gives a survey of the most important characters. In *fig. 1* four scatter diagrams are given for some calyx values.

3. CONCLUSION

From *table 2* as well as from *fig. 1* it appears that nearly each character is equal for the four populations of *O. scabrum* and *O. pulchrum*, or shows a great overlap. We only notice that the lateral teeth of the calyx upper lip are clearly shorter in the Mt. Kandilion specimens. Moreover it may be concluded that the differences between the two taxa, as formulated by Boissier, do not exist. For this reason *O. scabrum* and *O. pulchrum* have to be united into one species under the name *Origanum scabrum* Boiss. et Heldr. A further distinction of subspecies or varieties, as proposed by HAYEK (1931) and DAVIS (1949), must be rejected.

4. DESCRIPTION OF ORIGANUM SCABRUM

Origanum scabrum Boissier et Heldreich, in Boiss., *Diagn. Pl. Or. Nov.*, Ser. I (7): 48 (1846). *Fig. 2-4*.

Origanum sipyleum Sibth. et Sm. (non L.), *Fl. Graec. Prodr.*, Vol. I: 417 (1806) p.p. – *Origanum pulchrum* Boiss. et Heldr., in Boiss., *Diagn. Pl. Or. Nov.*, Ser. II (4): 11–12 (1859). – *Amaracus scaber* (Boiss. et Heldr.) Briq., in Engl. & Prantl, *Nat. Pflanzenfam.*, Vol. IV (3a): 306 (1897). – *Amaracus pulcher* (Boiss. et Heldr.) Briq., l.c. – *Amaracus scaber* (Boiss. et Heldr.) Briq. ssp. *euscaber* Hayek, *Prodr. Fl. penins. Balcan.*, Rep. Sp. Nov. Regni Veg. Beih. 30(2): 332 (1931). – *Amaracus scaber* (Boiss. et Heldr.) Briq. ssp. *pulcher* (Boiss. et Heldr.) Hayek, l.c. – *Origanum scabrum* Boiss. et Heldr. ssp. *euscabrum* (Hayek) Davis, *Kew Bull.* 1949 (3): 405 (1949). – *Origanum scabrum* Boiss. et Heldr. ssp. *pulchrum* (Boiss. et Heldr.) Davis, l.c.

Subshrub, flowers usually bisexual, sometimes gynodioecious. *Roots* up to 40 cm long and up to 1.5 cm in diameter. *Stems* up to 25 per plant, up to 45 cm long, erect, sometimes creeping and rooting at the base, slightly hairy. *Branches* practically always in the upper half of the stem, up to 8 pairs per stem, unbranched, 21(4–60)* mm long, usually each bearing a spike. *Leaves* up to 12 pairs

* For many characters an average value and, between brackets, a minimum and maximum value is given.



Fig. 2. Habit of *O. scabrum*.

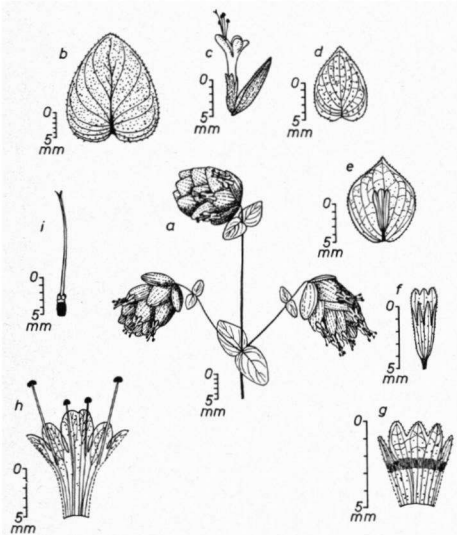


Fig. 3. Details of *O. scabrum*: (a) top of a plant with flowering spikes, (b) leaf, (c) bract with flower, (d) bract, (e) calyx with bract, (f) calyx, (g) calyx cut between the two lower lip teeth, (h) corolla cut through the middle lobe of the lower lip and (i) style with ovary.

per stem, sessile, heart-shaped, ovate or nearly orbicular, top acute or obtuse, 18(5–33) mm long, 14(3–24) mm wide, glaucous, covered with a waxy layer, short stiff hairs (about 100 μ long) at base and margin, sessile glands present on both sides, up to 750 per cm^2 . *Spikes* oblong-ovoid to subglobose, 18(10–25) mm long, 14(10–17) mm wide, nodding. *Bracts* 6(3–12) pairs per spike, heart-shaped or ovate, top acute or acuminate, 10(7–13) mm long, 7(5–10) mm wide, partially purple. *Flowers* 1 per bract, (sub)sessile. *Calyx* incised to about the middle, 5.3(3.9–6.8) mm long; upper lip usually divided up to about 1/3 (but rather variable) into 3 subequal, ovate to triangular, 0.9(0.1–2.5) mm long teeth; lower lip completely divided into 2 (sub)equal, lanceolate to triangular, 1.4(0.6–2.5) mm long teeth. *Corolla* incised to about 1/3, 10.8(7.3–13.6) mm long, pink to purple; upper lip divided up to about 1/7 into 2 equal, obtuse, 0.5(0.1–1.5) mm long lobes; lower lip divided up to about 2/3 into 3 subequal, ovate, 2.4(2.0–3.5) mm long lobes. *Stamens* usually protruding under the upper lip, sometimes reduced and sterile; filaments up to 8 and 11 mm long. *Ovary* about 1 mm in diameter; style up to 16 mm long; stigma lobes about 0.8 mm long. *Nutlet* ovate, about 0.8 mm long, dark brown.

Type specimens. Greece, Mt. Taygetos, near Agia Varvara above Pentaplon between stones in *Abies* forest, about 1800 m, Aug. 1844, *Th. de Heldreich* (lectotype in G, paratypes in BM, FI, L, W, WU).

Other specimens studied. Greece, Mt. Taygetos, near Splithara, 15 July 1897, *H. Zahn Herb. Gr. Norm. no. 1471* (B, COI, FI, G, JE, K, P, WU); Mt. Taygetos, above Anavrytis (Anavrouti), on rocks, 6 Aug. 1934, *C. Regel* (G);

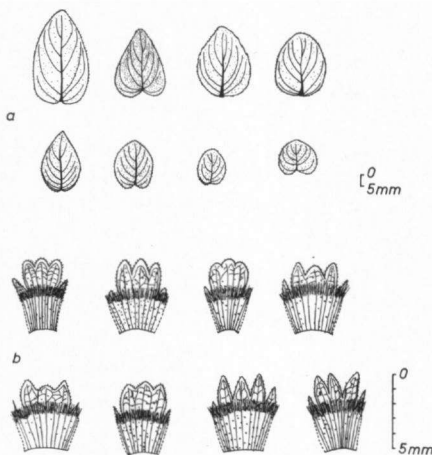


Fig. 4. Some variable parts of *O. scabrum*: (a) leaves and (b) calices, cut between the two teeth of the lower lip.

Mt. Taygetos, above Anavrouti, on limestone, in rock crevices and on debris, 1300–1800 m, together with scattered specimens of *Abies cephalonica* and *Pinus nigra* ssp. *pallasiana*, 16 July 1969, *A. Fokkinga* nos. 201, 214, 223, 241, 246, 255, 258 (Free University, Amsterdam); Mt. Malevo, near Vromopigadon, 1350 m, 19 July 1850, *Th. G. Orphanides Fl. Graeca Exsic. no. 42* (BM, COI, E, FI, K, L, P, WU); Mt. Malevo, 19 July 1881, *Th. de Heldreich* (JE, W); Mt. Malevo, near Vromopigadon and between Spilia and Sitena, Aug. 1937, *F. Guiol no. 2534* (BM); Mt. Kandilion, near a place called Oxygattos, not far from the top, 5 Aug. 1871, *Th. G. Orphanides Herb. Gr. Norm. no. 969* (B, BM, E, FI, G, JE, K, P, WU); Mt. Kandilion, July 1875, *Th. de Heldreich* (WU); Mt. Kandilion, on limestone, 1000–1218 m, 30 May 1955, *K. H. Rechinger fil. Iter Aeg. VII no. 16720* (W); Mt. Kandilion, between Achmet Aga and Hagios Sotir, in rock crevices on limestone, 300–700 m, 21 July 1956, *K. H. Rechinger fil. Iter Gr. VIII no. 18242* (G.,W); Mt. Kandilion, on limestone rocks, near the top, about 1300 m, Aug. 1959, *R. B. Spicer no. 92* (K); Mt. Kandilion, together with *Pinus halepensis* in the lower regions and *Abies cephalonica* in the upper regions, 300–1240 m, 26 June 1969, *A. Fokkinga* nos. 164, 166, 167, 171, 179, 182, 185 (Free University, Amsterdam); Mt. Delphi (Dirphys), about 1600–1700 m, Aug. 1848, *Th. de Heldreich* (G, JE, L, W); Mt. Delphi and Mt. Xerowouni (Xerowouni), on rock debris, 1500–1800 m, 7 Aug. 1858, *Th. de Heldreich Herb. Gr. Norm. no. 784* (BM, COI, FI, G, P); Mt. Delphi, 10–17 July 1880, *Th. de Heldreich* (W, WU); Mt. Delphi, 15–25 Aug. 1895, *Th. de Heldreich* (W); Mt. Delphi, at the top, 28 July 1901, *Chr. Leonis* (WU); Mt. Delphi, in *Abies* zone, Aug. 1910, *B. Tunta* (JE); Mt. Delphi, 1100 m, July 1929, *L. C. Pinatzi* (L); Mt. Delphi, 8 June 1930, *F. Guiol* (BM); Mt. Delphi, at the top, 24 July 1931, *L.C. Pinatzi Herb. Fl. Gr. no. 3527* (BM, G); Mt. Delphi, on limestone rock, at about 1000–1500 m, 13–17 July 1932, *K. H. Rechinger fil. Iter Gr. II nos. 2513 and 2572* (BM, G, W); Mt. Delphi, on limestone rocks and screes, 1200 m, July 1934, *S. C. Atchley* (K); Mt. Delphi, on limestone, 26 July 1938, *C. Regel* (G); Mt. Delphi, on limestone debris, at about 1100 m, 11 July 1965, *D. Phitos Fl. Hell. no. 3938* (W); Mt. Delphi and Mt. Xerowouni, between large rock boulders and on rock debris, limestone, 900–1700 m, in the lower regions together with *Abies cephalonica* in the upper regions, above the timber line, with *Juniperus oxycedrus* and *J. foetidissima*, 22 June, 1969, *A. Fokkinga* no. 152 (Free University, Amsterdam).

Geography. *O. scabrum* is a rather rare species endemic in Greece where it is known from four mountains: Mt. Taygetos and Mt. Malevo in the Peloponnese, Mt. Kandilion and Mt. Delphi (including Mt. Xerowouni) on the island Euboea. These sites constitute the north-western limit of the area of the group *Amaracus*. There is one herbarium specimen (under the name *O. pulchrum* in BM) from Crete, collected near Nida in 1899 by Baldacci. This record needs confirmation.

Ecology. On the mountains mentioned *O. scabrum* always occurs on limestone:

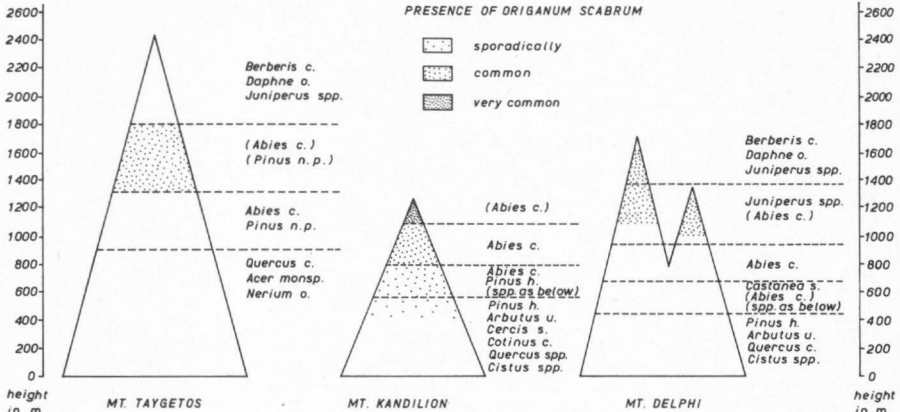


Fig. 5. Schematic picture of Mt. Taygetos, Mt. Kandilion and Mt. Delphi; dotted area: distribution of *O. scabrum*. For abbreviations of species names, see heading 'ecology'. Less abundant species are placed between brackets.

on screens, between boulders and in cracks. Mostly it is found at altitudes between 1000 and 1800 m. Therefore it can be considered as a montane species. Locally it is common. For a schematic picture of the vertical distribution of *O. scabrum* see fig. 5. In this figure as well as in the following text only the more common trees and shrubs in each zone are mentioned.

On Mt. Taygetos *O. scabrum* occurs from 1300 up to 1800 m. Here it grows with scattered specimens of *Abies cephalonica* Loudon and *Pinus nigra* Arn. ssp. *pallasiana* (Lamb.) Holmb. (the latter only up to 1600 m). The site of *O. scabrum* on Mt. Malevo could not be visited. From herbarium material available we conclude that it grows here at about 1300 m. On Mt. Kandilion *O. scabrum* occurs from 400–1246 m. From 400–800 m it only grows sporadically in clearings in a mixed wood of *Abies cephalonica* and *Pinus halepensis* Miller. In this zone also occur the eumediterranean species *Arbutus unedo* L., *Cercis siliquastrum* L., *Cotinus coggygria* Scop., *Quercus pubescens* Willd., *Q. coccifera* L. and *Cistus* species. From 800–1100 m *O. scabrum* chiefly grows in clearings in a dense wood of *Abies cephalonica*, here it is not frequent. Above 1100 m up to the top (1246 m) *O. scabrum* is common. On Mt. Delphi *O. scabrum* grows from 900–1700 m. At about 1000 m it occurs sporadically in clearings in an *Abies cephalonica* wood. From 1100 m upwards it becomes rather common. From here up to 1400 m it grows together with *Juniperus oxycedrus* L., *J. foetidissima* Willd., scattered specimens of *Abies cephalonica*, and *Daphne oleoides* Schreb.

From 1400–1700 m *O. scabrum* occurs together with, among other plants, the *Juniperus* species mentioned above, *Berberis cretica* L. and *Daphne oleoides*.

Relationship within the group *Amaracus*. Considering the morphology

and especially the habit, calyx and corolla, *O. scabrum* shows most affinity with *O. libanoticum* Boiss., a species occurring in the Lebanon Mts. To a lesser degree it also has characters in common with *O. sipyleum* L., which inhabits the whole western and southern part of Turkey. *O. scabrum* has little affinity with the other species of the group *Amaracus* occurring in Greece: *O. dictamnus* L. on Crete, *O. tournefortii* Sibth. in Ait. on Crete, Amorgos and several other Aegean islands, and *O. vetteri* Briq. et Barb. on Karpathos. The relationship to *O. lirium*, which sometimes occurs in the same location as *O. scabrum* will be discussed in a later publication.

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