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# A floristic report of mountains Gerania, Pateras, Kitheron and Pastra (Sterea Ellas, Greece)

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## RÉSUMÉ

CONSTANTINIDIS, Th. & A. YANNITSAROS (1996). Etude floristique des monts Gerania, Pateras, Kitheron et Pastra (Sterea Ellas, Grèce). *Candollea* 51: 303-322. En anglais, résumés français et anglais.

Ce travail établit une liste de taxons récoltés sur les monts Gerania, Pateras, Kitheron et Pastra, dont la majeure partie est nouvelle. De brefs commentaires sont fournis pour 25 d'entre-eux. *Narduroides salzmanii* est signalé pour la première fois pour la Grèce continentale et des précisions sont livrées sur la distribution d'*Asperula baenitzii*, *Coris monspeliensis* et *Valerianella orientalis* en Grèce.

## ABSTRACT

CONSTANTINIDIS, Th. & A. YANNITSAROS (1996). A floristic report of mountains Gerania, Pateras, Kitheron and Pastra (Sterea Ellas, Greece). *Candollea* 51: 303-322. In English, French and English abstracts.

This report lists records of taxa, the majority of which are new, collected on the mountains of Gerania, Pateras, Kitheron and Pastra. Brief comments are given for 25 of these. *Narduroides salzmanii* is reported as new for the Greek mainland. Further information on the distribution of *Asperula baenitzii*, *Coris monspeliensis* and *Valerianella orientalis* in Greece is also provided.

**KEY-WOROS:** Floristics – Mt. Gerania – Mt. Pateras – Mt. Kitheron – Mt. Pastra – Phytogeography – Greece.

## Introduction

The mountains of Attiki have attracted the attention of many early botanical collectors, particularly because of their short distance from Athens. These collectors, as well as their successors, contributed towards making their flora relatively well-known. This is especially the case for mountains Parnis, Imittos, and Egaleo (the latter being rather a low formation of hills), for which DIAPOULIS (1958), ZERLENDIS (1965) and SARLIS (1980) respectively gave an inventory of their flora. Moreover, SARLIS (1994) recently provided further floristic data on mountains Parnis, Imittos, Egaleo, Pendeli and some lowland areas of Attiki. In contrast, the mountains lying to the west of Attiki (Fig. 1) have received comparatively little attention. In spite of having been visited considerably early by botanists such as Th. Heldreich, Th. Orphanides and others,

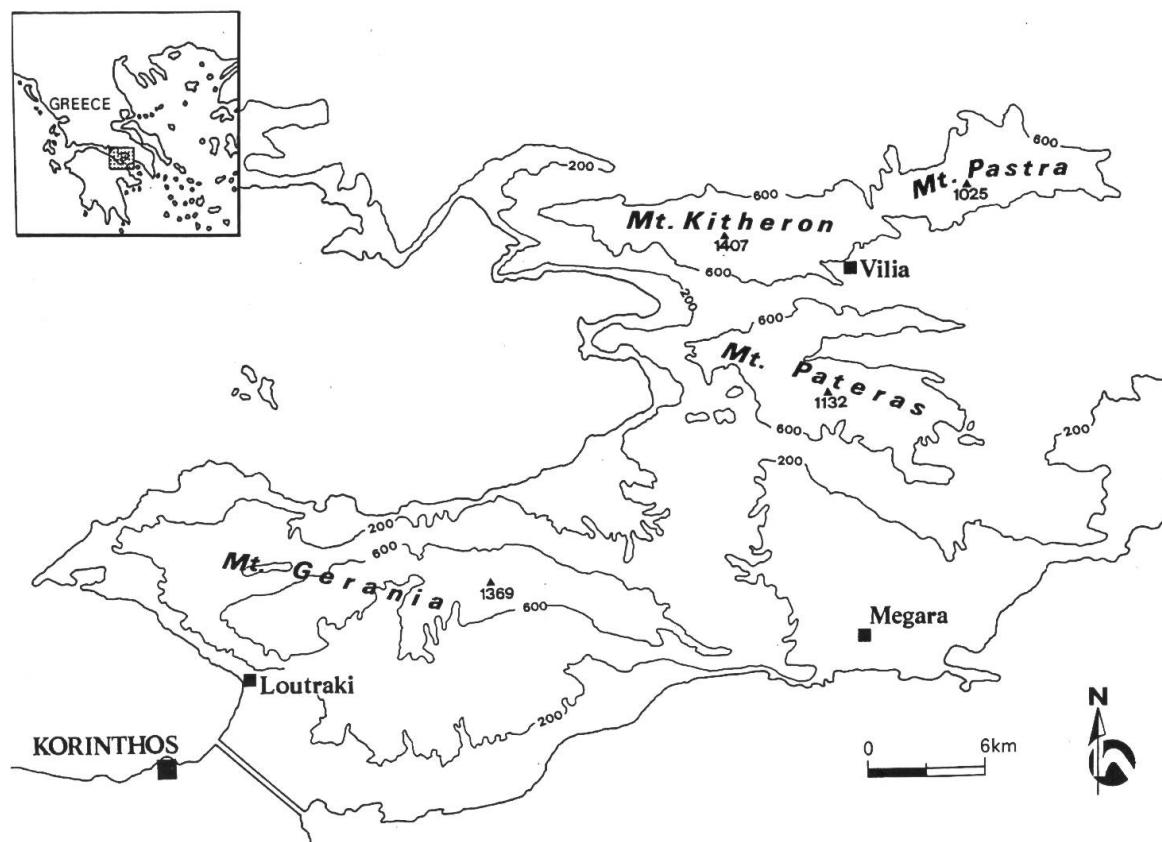


Fig. 1. – Topographical map of mountains Gerania, Pateras, Kitheron and Pastra.

only limited floristic information is available today and no separate publication has ever been devoted to them.

Mt. Gerania (or Yerania) is the southernmost mountain of the group studied here, situated between  $37^{\circ}56'$  to  $38^{\circ}03'$ N and  $22^{\circ}55'$  to  $23^{\circ}17'$ E. It generally shows a W-E orientation and belongs partly to Nomos Attikis and partly to Nomos Korinthias. Its highest peak, Makriplagi, reaches 1369 m. Other peaks above 1000 m are Tris Portes 1150 m, Megali Douskia 1068 m, Kastraki 1041 m and Pindiza 1031 m.

Mt. Pateras is a low mountain situated approximately between  $38^{\circ}03'$  to  $38^{\circ}08'$ N and  $23^{\circ}12'$  to  $23^{\circ}25'$ E. Its range belongs entirely to Nomos Attikis and can be divided topographically into two parts. The main part has a NW-SE orientation and includes the four highest peaks of the mountain, namely Liondari (or Elatos) 1132 m, Megali Kolosoura 1108 m, Agios Ilias 1091 m and Mikri Kolosoura 1018 m. The second part, an offshoot to the N of the main range, has a W-E orientation and is sometimes referred to by the name of Mt. Makron (849 m).

Mt. Kitheron (or Kitheronas) is the neighboring mountain to the N of Mt. Pateras. It has a W-E orientated axis, belongs partly to Nomos Attikis and partly to Nomos Viotias and is situated between  $38^{\circ}09'$  to  $38^{\circ}13'$ N and  $23^{\circ}07'$  to  $23^{\circ}21'$ E. Its highest peak, Profitis Ilias, reaches 1407 m; other peaks are Tris Korifes 1358 m and Rachi Frasouri 1043 m.

Mt. Pastra is the eastern continuation of Mt. Kitheron and is occasionally included in it. It also has a W-E orientation, belongs partly to Nomos Attikis and partly to Nomos Viotias and is defined by the coordinates  $38^{\circ}11'$  to  $38^{\circ}15'$ N and  $23^{\circ}20'$  to  $23^{\circ}29'$ E. Its highest peaks are Kourteza 1025 m, Petrogeraki 1016 m, and Astrokeleki 940 m.

From a geological point of view (data taken from I.G.M.E., 1971, 1984, 1985), Mts. Pateras, Kitheron and Pastra consist mainly of mid- and upper Triassic hard limestone. Fluvio-terrestrial deposits are usually encountered in the valleys between the mountains, while local occurrences of schist and sandstone are found on the E parts of Mt. Pateras and S parts of Mt. Pastra. An outcrop of bauxite on Mt. Pateras was exploited in the past. Likewise, a considerable part of Mt. Gerania also consists of hard limestone of mid to upper Triassic and lower Jurassic age but in much of its northern part ultramafic rocks (ultrabasites) are prevalent, most of them serpentinized. Local occurrences of ophiolithic substrates are also found W of the Mavrovouni summit. Fluvio-terrestrial deposits exist in the lower part of the mountain, mainly of conglomerates, sandstone and marls.

Previous records on the flora of the mountains investigated here have been summarized in HALÁCSY (1900-1904, 1908, 1912). Additional published information is included in STRID (1986a) and STRID & KIT TAN (1991). A brief reference to Mt. Gerania and its flora and vegetation was made by ROTHMALER (1944), while a list of taxa collected in Kaza, in the valley between Mts. Kitheron and Pastra appears in PODLECH (1967). Scant floristic data are also to be found in other sources, themselves unrelated to the flora of the mountains.

This paper is a preliminary report from the first author's thesis at present in progress at the Institute of Systematic Botany, University of Athens. As a rule, only taxa new for each mountain appear in the catalogue given below. Previously reported taxa are cited exceptionally when they deserve comments on their taxonomy or distribution, e.g. *Centaurea achaia* subsp. *achaia* and *C. achaia* subsp. *corinthiaca*, *Convolvulus compactus*, *Consolida tuntasiana*, *Asperula baenitzii*, *Daphne jasminea*. All the specimens mentioned here are temporarily kept by the first author and will later be distributed to ATHU, UPA and elsewhere. The nomenclature follows *Med-Checklist* (GREUTER & al., 1984-1989), and/or *Flora Europaea* (TUTIN & al., 1968-1980, 1993), *Flora of Turkey and the East Aegean islands* (DAVIS, 1965-1985) and *Mountain Flora of Greece* (STRID, 1986a; STRID & KIT TAN, 1991). The species are listed hereafter, according to family, in alphabetical order. Italicized numbers in brackets at the end of the locality data refer to collection numbers by the first author.

## Pteridophyta

### *Polypodiaceae*

#### ***Asplenium cuneifolium* Viv.**

Mt. Gerania, between the summits Makriplagi and Tris Portes, small ravine, ophiolithic substrate, 38°00'N 23° 03'E, alt. ca. 800 m. (5234).

This species was found growing in one locality only, among dark stones in semishade, in a small ravine formed apparently by a stream. The preference of *A. cuneifolium* for serpentine gives it a disjunct distribution much dependent on this particular sort of substrate. Its closest known locality in Greece lies in C Evvia (JALAS & SUOMINEN 1972). A few individuals only were counted on Mt. Gerania and the species is found here at the southernmost limit of its distribution range in Greece.

#### ***Notholaena marantae* (L.) Desv. subsp. *marantae***

Mt. Gerania, between the summits Makriplagi and Tris Portes, small ravine, ophiolithic substrate, 38°00'N 23° 03'E, alt. ca. 800 m. (5235).

**Angiospermae – Dicotyledones**  
**Aristolochiaceae**

**Aristolochia elongata** (Ducharte) Nardi

Mt. Kitheron, N slopes, SE of the Agia Triada monastery, 38° 11'N 23° 14'E, alt. ca. 650 m. (3644).

*Asclepiadaceae*

**Vincetoxicum fuscatum** (Hornem.) Reichenb. fil.

Mt. Pateras, ca. 0.8 km from Paleokoundoura, along the road to the summit, 38° 07'N 23°22'E, alt. ca. 500 m. (610).

*Berberidaceae*

**Leontice leontopetalum** L. subsp. **leontopetalum**

Mt. Gerania, SE of Lisi summit, cultivated cereal fields, 37°59'N 23°13'E, alt. ca. 640 m. (2947).

Mt. Pateras, cultivated cereal fields close to Paleokoundoura, 38°07'N 23°22'E, alt. ca. 350 m. (2889).

*Boraginaceae*

**Cerinthe retorta** Sm.

Mt. Pastra, ca. 8 km ENE of Erithres, calcareous rocks, 38°14'N 23°24'E, alt. ca. 450 m. (4408).

**Lithospermum sibthorpiatum** Griseb.

Mt. Pateras, S slopes NE of Veniza, 38°05'N 23°15'E, alt. ca. 650 m. (1250).

**Myosotis refracta** Boiss. subsp. **paucipilosa** Grau

Mt. Pateras, calcareous slopes of the Agios Ilias summit, 38°06'N 23°21'E, alt. ca. 950 m. (4454).

**Nonea obtusifolia** (Willd.) DC.

Mt. Pateras, ca. 0.8 km from Paleokoundoura, along the road to the summit, 38°07'N 23°22'E, alt. ca. 500 m. (969).

*Caryophyllaceae*

**Arenaria muralis** (Link) Sprengel

Mt. Gerania, along the forest road Schinos – Pissia, 38°02'N 23°00'E, alt. ca. 380 m. (3151a).

A predominately Aegean species with a few, rare occurrences in continental Greece and W Anatolia (CARLSTRÖM, 1986). On Mt. Gerania it was found growing together with, but readily distinguishable from, other *Arenaria* species, at road sides.

#### **Bufonia paniculata** F. Dubois

Mt. Pateras, NW slopes of the summit Mikri Kolosoura, 38°07'N 23°17'E, alt. ca. 850 m. (2287).

Mt. Kitheron, SE part, open meadows, 38°10'N 23°15'E, alt. ca. 880 m. (2324).

#### **Bufonia stricta** (Sm.) Gürke subsp. **stricta**

Mt. Gerania, ca. 2.5 km E of the summit Makriplagi, on limestone, 38°01'N 23°09'E, alt. ca. 1000 m. (3901); the W and SW slopes of summit Korifi, ophiolithic substrate, 38°01'N 23°03'E, alt. ca. 900 m. (4828).

Mt. Pateras, the W slopes of summit Liondari, limestone, 38°06'N 23°19'E, alt. ca. 1000 m. (4910).

Apart from several localities in Kriti, where the Cretan endemic *B. stricta* subsp. *ceccaniana* (Bald.) Rech. fil. is also known to exist (TURLAND & al., 1993), this Greek endemic taxon is known from Mt. Parnon in Peloponnisos and Mt. Imittos in Attiki (STRID, 1986b). Most of its populations are found on limestone, but on Mt. Gerania it grows equally well on limestone and serpentine. Although serpentine plants appear to have taller stems, they do not differ from neighboring populations in other features and differ considerably in their habit from *B. euboica* Phitos & Kamari, a recently described serpentine species (PHITOS & KAMARI, 1992). The localities in Attiki constitute the northern limits of the distribution of *B. stricta*.

#### **Cerastium dichotomum** L.

Mt. Gerania, SE of Lisi summit, edges of cultivated fields, 37°59'N 23°13'E, alt. ca. 640 m. (2975); place called Seki, between Schinos and Pissia, 38°01'N 22°59'E, alt. ca. 500 m. (3138).

Mt. Kitheron, ca. 1.5 km SW of Kapareli, edges of cultivated fields, 38°12'N 23°12'E, alt. ca. 450 m. (2997).

*C. dichotomum*, a species with a sparse occurrence in Greece (JALAS & SUOMINEN, 1983; GREUTER & al., 1984) was found to grow almost exclusively along the edges and furrows of cultivated fields, preferably with cereals, or in recently abandoned fields. Its existence seems to be dependent on more traditional methods of cultivation. Other interesting or rare plants in Greece which often coexist with *C. dichotomum* in the areas under investigation, include *Leontice leontopetalum* subsp. *leontopetalum*, *Ranunculus falcatus*, *Valerianella orientalis*, *Bellevalia ciliata* and *Roemeria hybrida*.

#### **Cerastium ramosissimum** Boiss.

Mt. Gerania, between Mazi and Schinos, ophiolithic substrate, 38°02'N 23°07'E, alt. ca. 520 m. (2431); between the summits Mikri Douskia and Megali Douskia, ophiolithic substrate, 38°01'N 23°02'E, alt. ca. 850 m. (4386); the E slopes of summit Megali Douskia, ophiolithic substrate, 38°01'N 23°03'E, alt. ca. 900 m. (4598).

#### **Dianthus monadelphus** Vent. subsp. **pallens** (Sm.) Greuter & Burdet

Mt. Pateras, E of Petra Korakou, 38°07'N 23°14'E, alt. ca. 650 m. (2034); N of Korona summit, 38°06'N 23°06'E, alt. ca. 480 m. (2166); N of Psatha, 38°07'N 23°13'E, alt. ca. 450 m. (2215).

**Dianthus tripunctatus Sm.**

Mt. Pateras, N of Korona summit, 38°06'N 23°06'E, alt. ca. 480 m. (2167).

**Moenchia graeca Boiss. & Heldr.**

Mt. Gerania, on the summit Korifi, ophiolithic substrate, 38°01'N 23°03'E, alt. ca. 900 m. (4388 & 4571).

**Silene fabaria (L.) Sm. subsp. *domocina* Greuter**

Mt. Gerania, foothills, between Mavrolimni and Pefkogiali, ophiolithic substrate, 38°03'N 23°06'E, alt. ca. 10-20 m. (3238); by a spring, on the way from Megali Douskia to Loutraki, ophiolithic substrate, 38°00'N 23°01'E, alt. ca. 650 m. (4816).

A recently described taxon (GREUTER, 1995) with a preference for ophiolithic substrates. On Mt. Gerania it has been found on stony slopes, scree and gravel, at altitudes ranging from almost sea-level to 900 m (sterile rosettes observed in ravines of Tris Portes summit). The plants in their natural habitat seem to be biennials or short-lived perennials, behaving occasionally as annuals in cultivation, with fleshy leaves often tinged with violet nerves, ascending stems and usually violet filaments. The most proximal known locality of *S. fabaria* subsp. *domocina* and at the same time its *locus classicus* lies about 150 km to the north, on the ophiolithic belt of Domokos area. Typical plants of subsp. *fabaria* were not found by the authors on Mt. Gerania.

**Silene graeca Boiss. & Spruner**

Mt. Pateras, S foothills NE of Veniza, 38°05'N 23°16'E, alt. ca. 380 m. (1408).

**Silene reinholdii Heldr.**

Mt. Pateras, NE of Psatha, 38°07'N 23°14'E, alt. ca. 420 m. (1321); NE of Veniza, 38°05'N 23°16'E, alt. ca. 640 m. (1396); slopes N of Korona summit, 38°06'N 23°15'E, alt. ca. 440 m. (1637).

**Spergula pentandra L.**

Mt. Gerania, on the slopes between the summits of Megali Douskia and Mikri Douskia, ophiolithic substrate, 38°01'N 23°02'E, alt. ca. 850 m. (4390).

*Compositae***Bombycilaena erecta (L.) Smolj.**

Mt. Pateras, NW of Veniza, 38°05'N 23°15'E, alt. ca. 540 m. (1453); SW slopes of the mountain, WNW of Anemochori, 38°05'N 23°14'E, alt. ca. 650 m. (2585a).

Its occurrence in Greece, previously questioned by HOLUB (1976), has been confirmed by PAVLIDES (1985). The species grows on dry, bare calcareous slopes and along narrow animal tracks on Mt. Pateras, and is accompanied by species of the allied genus *Filago*.

**Centaurea achaia Boiss. & Heldr. subsp. *achaia* (syn. *C. sibthorpii* Halácsy)**

Mt. Gerania, foothills, along roadsides on the way to Agios Ioannis Prodromos monastery, 38°03'N 23°12'E, alt. ca. 270 m. (2609, white floret form and 2610 pink-purplish floret form); between Pissia and the monastery of Osios Patapios, 37°59'N 22°58'E, alt. ca. 600 m. (3759, both colour forms in coexistence).

Mt. Pateras, NE of Psatha, stony paths,  $38^{\circ}06'N$   $23^{\circ}15'E$ , alt. ca. 470 m. (1760); between Psatha and Anemochori,  $38^{\circ}05'N$   $23^{\circ}14'E$ , alt. ca. 650 m. (2180); close to Veniza,  $38^{\circ}04'N$   $23^{\circ}14'E$ , alt. ca. 250 m. (2209 & 2211).

In the above cited localities all the varieties described by BOISSIER (1856) and later adopted by PHITOS (1992) were encountered. The species possesses a remarkable variation which makes any separation of taxa at levels higher than variety difficult (PHITOS, 1992; ROUTSI, 1993), with the exception of subsp. *corinthiaca* (see below). In the area under study, individuals with pink-purplish and white florets often coexist. The distribution of essential characters, such as spine length and cilia in involucral bracts, varies even within the same plant. Following PHITOS (1992) and ROUTSI (1993), *C. sibthorpii* has considered synonymous with *C. achaia*. Subspecies *achaia* is connected via a number of intermediate forms to subsp. *corinthiaca*. A previous reference to *C. achaia* on Mt. Pateras is found in HALÁCSY (1912: 165, as *C. sibthorpii*).

#### **Centaurea achaia** Boiss. & Heldr. subsp. **corinthiaca** (Boiss. & Heldr.) Phitos & Georgiadis

Mt. Gerania, W slopes, SE of Mazi, ophiolithic substrate,  $38^{\circ}02'N$   $23^{\circ}08'E$ , alt. ca. 470 m. (2509); along the road from Loutraki to Panagia Parthi,  $38^{\circ}00'N$   $23^{\circ}01'E$ , alt. ca. 450 m. (4818 & 4820); ca. 3.5 km away from Loutraki, on the way to Gerania,  $37^{\circ}58'N$   $23^{\circ}01'E$ , alt. ca. 150 m. (4830).

WAGENITZ & GAMAL-ELDIN (1985) and ROUTSI (1993) regard *C. corinthiaca* as an independent species and a relative of the variable *C. achaia*. According to them, *C. corinthiaca* differs from *C. achaia* by its smaller habit and capitulum size, by the fewer cilia on the bracts, by the arrangement of the bracts whose basal part is covered only up to 70% by the appendages of those bracts directly underneath, and by its white florets bearing orange nerves.

While collecting on the slopes of Mt. Gerania and around Loutraki, we came across a more complex pattern of variation. Plants from the serpentine N slopes of Mt. Gerania have small capitula, quite dense arrangement of bracts and brownish to dark brown appendages with their central spine occasionally conspicuously curving downwards. Their florets are pink to purplish, rarely white. Specimens from the SW serpentine slopes of Mt. Gerania present characters more or less intermediate between subsp. *achaia* and subsp. *corinthiaca* and have white florets with the exception of a few plants with pale violet florets. Moreover, specimens collected NE of Loutraki, on sandy soil, are close to *C. achaia* subsp. *corinthiaca* in all respects except for the basal parts of the bracts which are covered to a varying and apparently random extent by appendages of the bracts immediately underneath.

Whether the above mentioned populations represent true hybrids between subsp. *achaia* and subsp. *corinthiaca* remains to be proved. It seems, however, that the limits between these two taxa are rather weak and the typical small population of *C. corinthiaca* from the area between Isthmos and Loutraki (WAGENITZ & GAMAL-ELDIN, 1985) is just an extreme morphological form of the much more variable *C. achaia*. Under these circumstances it would be better for *C. corinthiaca* to be treated as a geographical race of *C. achaia* at subspecific rank (PHITOS & GEORGIADIS, 1981).

#### **Mantisalca salmantica** (L.) Briq. & Cavill.

Mt. Pateras, close to Ano Alepochori,  $38^{\circ}05'N$   $23^{\circ}13'E$ , alt. ca. 320 m. (2003).

#### **Senecio macedonicus** Griseb.

Mt. Kitheron, NE slopes of the summit Gennimata,  $38^{\circ}11'N$   $23^{\circ}19'E$ , alt. ca. 800-900 m. (5363).

**Xeranthemum inapertum** (L.) Miller

Mt. Pateras, S of the summit Megali Kolosoura, doline, 38°06'N 23°16'E, alt. ca. 700 m. (4715).

*Convolvulaceae***Convolvulus compactus** Boiss.

Mt. Gerania, the summit Korifi, ophiolithic substrate, 38°01'N 23°03'E, alt. ca. 950 m. (4574).

Mt. Pateras, E of the summit Loundari, 38°06'N 23°20'E, alt ca. 1050 m. (1841); S slopes of the summit Loundari, 38°06'N 23°19'E, alt. ca. 1000 m. (2115); the summit Megali Kolosoura, 38°06'N 23°17'E, alt. ca. 1000 m. (4708).

This species, known from a few localities in Greece (STRID, 1991), is reported to grow both on serpentine and limestone substrates (BERGMEIER, 1988). This is also the case here with all populations on Mt. Pateras (see also HALÁCSY, 1902: 306, as *C. cochlearis* Griseb.) growing on limestone, and one population on Mt. Gerania growing on the stony ground of the serpentine summit Korifi.

**Convolvulus pentapetaloides** L.

Mt. Gerania, ca. 1 km W of Pissia, 38°01'N 23°00'E, alt. ca. 600 m. (3263).

**Convolvulus siculus** L. subsp. **siculus**

Mt. Gerania, close to Schinos, 38°03'N 23°02'E, alt. ca. 180 m. (2933).

*Cruciferae***Alyssum smyrnaeum** Meyer

Mt. Pastra, W of the village of Panakton, 38°11'N 23°28'E, alt. ca. 550-600 m. (s.n.).

**Camelina rumelica** Velen.

Mt. Pateras, S slopes, E of Veniza, 38°05'N 23°15'E, alt. ca. 550 m. (1461).

**Hesperis laciniata** All. subsp. **laciniata**

Mt. Pastra, c. 8 km ENE of Erithres, 38°14'N 23°24'E, alt. ca. 480 m. (4407).

**Iberis odorata** L.

Mt. Kitheron, c. 8 km SW of Kapareli, 38°11'N 23°11'E, alt. ca. 420 m. (3048).

**Lunaria annua** L. subsp. **pachyrhiza** (Borbás) Hayek

Mt. Pateras, the Korona summit, 38°05'N 23°15'E, alt. ca. 680 m. (1606).

**Matthiola fruticulosa** (L.) Maire

Mt. Gerania, foothills, above Ano Kineta, 37°58'N 23°12'E, alt. ca. 160 m. (2860).

Mt. Pateras, between Psatha and Alepochori, 38°05'N 23°12'E, alt. ca. 260 m. (1233).

***Thlaspi bulbosum*** Spruner ex Boiss.

Mt. Pastra, W of the village of Pili, non-calcareous substrate, 38°12'N 23°28'E, 520-580 m. (5298).

***Thlaspi pindicum*** Hausskn.

Mt. Gerania, between Mazi and Schinos, ophiolithic substrate, 38°02'N 23°06'E, 530 m. (2385); between the summits Makriplagi and Tris Portes, ophiolithic substrate, 38°01'N 23°05'E, 800 m. (5242).

A south Balkan endemic, mainly occurring on serpentine (FRANZÉN, 1986). Our localities seem to be its southernmost known limit and are an extension of its known sites in northern and central Evvia where the species grows once again on serpentine. On Gerania it is usually found on stony slopes sparsely covered with trees and bushes, below 1000 m alt.

*Dipsacaceae****Cephalaria setulifera*** Boiss. & Heldr.

Mt. Gerania, SW slopes of the summit Pindiza, 38°00'N 22°58'E, alt. ca. 830 m. (5070).

Mt. Pateras, the summit of Mikri Kolosoura, 38°07'N 23°17'E, alt. ca. 850 m. (2280).

Mt. Kitheron, rocks before the EOS refuge, 38°10'N 23°16'E, alt. ca. 900 m. (2302).

A rare species in Greece with a few previous reported localities, considered endemic (KOKKINI, 1991 but see also VERLAQUE, 1985 for a different opinion). It flowers late in summer and ripe fruits are usually found in autumn. In the area under investigation, it grows on calcareous rocky slopes and is subject to heavy grazing which makes fruit setting difficult. Its currently known distribution appears rather limited, and this may reflect undercollection.

***Lomelosia hymettia*** (Boiss. & Spruner) Greuter & Burdet

Mt. Pateras, W slopes, E of Psatha, 38°06'N 23°08'E, alt. ca. 200 m. (3920).

*Geraniaceae****Erodium chrysanthum*** L'Hér.

Mt. Kitheron, between the summits of Profitis Ilias and Rachi Frasouri, 38°11'N 23°08'E, alt. ca. 1100 m. (4702).

*Labiatae****Thymus atticus*** Čelak.

Mt. Pastra, slopes of the summit Astropeleki, 38°12'N 23°24'E, 850-940 m. (5709).

***Thymus parnassicus*** Halácsy

Mt. Kitheron, summit Profitis Ilias, 38°10'N 23°15'E, alt. ca. 1350 m. (2710).

***Thymus teucrioides*** Boiss. & Sprun. subsp. ***candilicus*** (Beauv.) Hartvig

Mt. Gerania, the W and SW slopes of the Korifi summit, ophiolithic substrate, 38°01'N 23°03'E, alt. ca. 900 m. (4825).

*Leguminosae****Astragalus epiglottis* L.**

Mt. Gerania, between Schinos and Pissia, 38°01'N 23°00'E, alt. ca. 380 m. (3218).

Mt. Pateras, between Psatha and Egosthena, 38°07'N 23°13'E, alt. ca. 390 m. (1294a & 1352).

***Lotus conimbricensis* Brot.**

Mt. Gerania, between Schinos and Pissia, 38°01'N 23°00'E, alt. ca. 520 m. (3164).

*Lentibulariaceae****Pinguicula crystallina* Sm. subsp. *hirtiflora* (Ten.) Strid**

Mt. Gerania, between the summits Makriplagi and Tris Portes, small ravine, ophiolithic substrate, 38°00'N 23° 03'E, alt. ca. 800 m. (5250).

*Lythraceae****Lythrum thymifolia* L.**

Mt. Gerania, NW slopes of the Paliovouna summit, abandoned land, 38°01'N 22° 57'E, alt. ca. 400-500 m. (s.n.).

Rare but probably undercollected in Greece. See PERSSON (1986) for additional comments.

*Oleaceae****Fraxinus ornus* L.**

Mt. Pateras, NW slopes, above Agia Paraskevi, 38°07'N 23°16'E, alt. ca. 850 m. (1952).

Mt. Pastra, NW of the monastery of Osios Meletios, 38°12'N 23°26'E, alt. ca. 800 m. (3956).

*Papaveraceae****Papaver argemone* L. subsp. *nigrotinctum* (Fedde) Kadereit**

Mt. Pateras, W slopes of the summit Mikri Kolosoura, 38°07'N 23°07'E, alt. ca. 820 m. (1680).

***Papaver somniferum* L. subsp. *somniferum***

Mt. Pateras, summit Korona, 38°05'E 23°15'E, alt. ca. 650 m. (2191).

**Roemeria hybrida** (L.) DC.

Mt. Pateras, doline known as Megalo Vathichori, 38°06'N 23°15'E, alt. ca. 400 m. (449).

*Primulaceae*

**Coris monspeliensis** L. s.l.

Mt. Gerania, between Pissia and the monastery of Osios Patapios, 38°00'N 22°58'E, alt. ca. 650 m. (3737).

A rare plant in Greece. Its existence was recently reported by GEORGIADIS & CHRIS-TODOULAKIS (1984), IATROU (1989) and BROWICZ & ZIELINSKI (1989) in Peloponnisos and Zakynthos, although earlier unconfirmed reports of the same species also exist (e.g. KAV-VADAS, 1956). Our record seems to be the first of this species for Sterea Ellas. Although its occurrence in Greece was confirmed quite recently, its habitats are not directly influenced by human activities, and consequently the species cannot be considered as a recent introduction, but a natural element of the Greek flora. On Mt. Gerania it grows together with other interesting plants such as *Chaenorhinum rubrifolium*, *Lomelosia hymettia*, *Helianthemum syriacum*, etc. Its known distribution in Greece is shown in Fig. 3.

*Ranunculaceae*

**Consolida tenuissima** (Sm.) Soó

Mt. Pateras, E of Psatha, 38°06'N 23°14'E, alt. ca. 250 m. (1924); the low summit Kandili, 38°03'N 23°24'E, alt. ca. 460 m. (4499).

**Consolida tuntasiana** (Halászy) Soó

Mt. Gerania, close to Goura spring, 38°01'N 23°08'E, alt. ca. 1040 m. (2374).

Mt. Kitheron, S of the monastery of Agia Triada, 38°11'N 23°14'E, alt. ca. 950 m. (3648); W of the Profitis Ilias summit, 38°11'N 23°14'E, alt. ca. 1200 m. (4682).

*C. tuntasiana* was described as *Delphinium tuntasianum* by HALÁCSY (1912) from material collected by Tuntas on Mt. Gerania, the classical locality. It was found afterwards on Mts. Arachneon (*Runemark & Svensson* 48666, LD) and Koulochera (*Runemark & Svensson* 48360, LD) in Peloponnisos, and now on Mt. Kitheron. It is a rare Greek endemic annual species growing on rocky calcareous slopes and in clearings of *Abies cephalonica* forest.

**Delphinium fissum** Waldst. & Kit. subsp. **fissum**

Mt. Kitheron, between the summits Profitis Ilias and Rachi Frasouri, 38°11'N 23°13'E, alt. ca. 1200 m. (4695).

**Ranunculus falcatus** L.

Mt. Gerania, NW of the Flitzadeza summit, 38°02'N 22°56'E, alt. ca. 450 m. (2913).

Mt. Pateras, N of the Korona summit, 38°06'N 23°15'E, alt. ca. 400 m. (396); W slopes, Megalo Vathichori doline, 38°06'N 23°14'E, alt. ca. 740 m. (1670).

In the area under study, *R. falcatus* is encountered exclusively along the edges of cultivated fields and appears to be much affected by modern methods of cultivation.

### *Rubiaceae*

#### **Asperula baenitzii** Heldr. ex Boiss.

Mt. Pateras, small ravine NE of the summit Liodari,  $38^{\circ}06'N$   $23^{\circ}20'E$ , alt. ca. 860 m. (2126); the summit Liodari,  $38^{\circ}06'N$   $23^{\circ}19'E$ , alt. ca. 1100 m. obs.; the summit Profitis Ilias,  $38^{\circ}05'N$   $23^{\circ}21'E$ , alt. ca. 1050 m., obs.; E of Mirini,  $38^{\circ}04'N$   $23^{\circ}21'E$ , alt. ca. 700 m., obs.

*A. baenitzii* was considered to be an endemic species of Mt. Pateras (SCHÖNBECK-TEMESY & EHRENDORFER, 1985, 1991) but has also been reported from Mt. Parnis by DIAPOULIS (1958). The latter reference is supported by a specimen kept in ACA (!). The same species was also collected in 1930 and 1932 on summit Ornio, Mt. Parnis by L. Pinatzis (specimens kept in the private Herbarium Pinatzi) and by Diapoulis again on Mt. Egaleo, a low mountain close to Athens (specimen in ACA!). Fruit characters not mentioned in the original description (BOISSIER, 1888: 280) are: mericarps 1.5 – 2.5 mm, yellowish to reddish – brown, rugulose, glabrous. The species should be classed as vulnerable, and its overall known distribution is shown in Fig. 2.

### *Scrophulariaceae*

#### **Chaenorhinum rubrifolium** (Robill & Cast. ex DC.) Fourr.

Mt. Gerania, between Pissia and the monastery of Osios Patapios,  $38^{\circ}00'N$   $22^{\circ}58'E$ , alt. ca. 650 m. (3775); NE of Ano Kineta,  $37^{\circ}59'N$   $23^{\circ}11'E$ , alt. ca. 550 m. (4664).

Mt. Pateras, NE of Veniza,  $38^{\circ}05'N$   $23^{\circ}15'E$ , alt. ca. 450 m. (1409); W of the Korona summit,  $38^{\circ}05'N$   $23^{\circ}14'E$ , alt. ca. 630 m. (1779).

SPETA (1980) gives a detailed survey of the genus *Chaenorhinum* in the east Mediterranean area. The populations on Mts. Gerania and Pateras are found mainly along trucks and on open calcareous slopes, and the plants usually lack any basal rosette at flowering time. Seed characters however, match those of var. *rubrifolium* as defined by BENEDÍ (1991). The species has also been found by the first author in Peloponnisos (Mt. Parnon, between Sitena and Kastanitsa) during an excursion in April 1991.

#### **Verbascum boissieri** (Heldr. & Sart. ex Boiss.) Ö. Kuntze

Mt. Gerania, SE of Mazi, ophiolithic substrate,  $38^{\circ}02'N$   $23^{\circ}06'E$ , alt. ca. 900 m. (2466); between Mavrolimni and Pefkogiali, ophiolithic substrate,  $38^{\circ}03'N$   $23^{\circ}06'E$ , alt. ca. 10 – 50 m. (3237); rocks WNW of the monastery of Osios Patapios, limestone,  $37^{\circ}59'N$   $22^{\circ}58'E$ , alt. ca. 700 m. (3744).

Mt. Pateras, between Psatha and Alepochori, limestone,  $38^{\circ}05'N$   $23^{\circ}13'E$ , alt. ca. 250 m. (1228).

#### **Verbascum orientale** (L.) All.

Mt. Pateras, E of Psatha,  $38^{\circ}06'N$   $23^{\circ}13'E$ , alt. ca. 250 m. (1922).



Fig. 2. – Total known geographical distribution of *Asperula baenitzii*.

*Thymelaeaceae***Daphne jasmina** Sm.

Mt. Gerania, ravine WSW of Mavrolimni, 38°03'N 23°04'E, alt. ca. 60 m. (2820); WNW of the monastery of Osios Patapios, 37°59'N 22°58'E, alt. ca. 700 m. (3765); NE of Ano Kineta, 37°59'N 23°11'E, alt. ca. 650 m. (4647).

Mt. Pateras, WNW of the monastery of Agia Triada, 38°04'N 23°21'E, alt. ca. 550 m. (767 & 770); the Korona summit, 38°05'N 23°15'E, alt. ca. 650 m. (2190); WNW of Anemochori, 38°05'N 23°13'E, alt. ca. 650 m. (2583).

The species has a few known localities in the Greek mainland and Libya (see HALÁCSY, 1904: 77, BORATYNNSKI & al., 1992: 90), and has recently also been reported from Kriti (TURLAND, 1992) thus, filling in its phytogeographical gap. The plants on Mts. Gerania and Pateras grow as obligate chasmophytes on calcareous rocks and have a creamy to yellowish-creamy corolla instead of pink as previously reported. ZIELINSKI (pers. comm.) observed pubescent instead of glabrous ovaries in his material, and the same is also true for the material collected and checked by the present authors.

*Umbelliferae***Conium divaricatum** Boiss. & Orph.

Mt. Gerania, NW of the monastery of Osios Patapios, 38°00'N 22°58'E, alt. ca. 700 m. (3764).

Mt. Pastra, ca. 8 km ENE of Erithres, 38°14'N 23°24'E, alt. ca. 450 m. (4409).

LEUTE (1971) gives good reasons for considering this taxon as an independent species, distinguishable from *C. maculatum* L. The specimens from Mts. Gerania and Pastra support this separation. In our collections, fresh petals have a clear white color which turned pinkish-rose after drying. This color change may explain previous citations of the species as having reddish petals.

**Johrenia distans** (Griseb.) Halácsy

Mt. Gerania, N of Kineta, 37°59'N 23°12'E, alt. ca. 600 m. (4653).

Mt. Pateras, Petra Korakou, 38°07'N 23°14'E, alt. ca. 520 m. (2060); N slopes, SE of the summit Liondari, 38°06'N 23°20'E, alt. ca. 800 m. (4917).

*J. distans*, a Greek endemic species, is the only European representative of the Asiatic genus *Johrenia* (no further information is known regarding the dubious status of *J. thessala* Bornm.) and has rare occurrences on the Ionian Islands, Peloponnisos, Sterea Ellas, Evvia and the Athos Peninsula. It is related to the Asiatic *J. dichotoma* DC. and despite the account of BORNMÜLLER (1930), the two species need further study as they may not be specifically distinct. Considerable variation is present in the Greek material with respect to the shape of rosette leaves, mericarp size, degree of spreading and number of umbell rays.

**Torilis tenella** (Delile) Reichb.

Mt. Pastra, ca. 6 km ENE of Inoi, 38°10'N 23°29'E, 350-450 m. (5469).

*Valerianaceae*

**Valerianella orientalis** (Schlecht.) Boiss. & Bal.

Mt. Gerania, between Schinos and Pissia, 38°01'N 23°00'E, alt. ca. 500 m. (3200); W slopes of the summit Megali Douskia, 38°01'N 23°02'E, alt. ca. 850 m. (4588).

Mt. Pateras, N of the Korona summit, 38°06'N 23°15'E, alt. ca. 420 m. (1642); the doline of Megalo Vathichori, 38°06'N 23°16'E, alt. ca. 740 m. (1675); small valley N of the summit Agios Ilias, 38°05'N 23°21'E, alt. ca. 850 m. (4465).

Mt. Pastra, W of the village of Panakton, 38°11'N 23°28'E, 550-600 m. (5329).

*V. orientalis*, a species with a predominantly E Mediterranean distribution, has surprisingly also been recorded from Spain (CHARPIN & MOLERO, 1984). Its first discovery on the Greek mainland was made by L. Pinatzis (GOULANDRIS, 1978; TOWNSEND, 1982), but earlier the species has been collected on the E Aegean Islands. Notably, Th. Orphanides collected *V. orientalis* on the island of Chios, near Pityos, as early as 1856 (ATHU!) and P. C. Candargy on Mt. Paleokastron on Lesvos island in 1891 as *Valerianella thelocarpa* Cand. (DIEMAR & SEBERG, 1989). In the area under study, *V. orientalis* often occurs in man-influenced habitats and is a member of the interesting flora existing along the edges of cultivated fields, especially where more traditional methods of cultivation are used. The known distribution of the species in Greece, based on our material, earlier records, as well as material kept in ATHU and UPA is shown in Fig. 3.

**Angiospermae – Monocotyledones**

*Gramineae*

**Briza humilis** Bieb.

Mt. Gerania, close to OTE station, 38°01'N 23°08'E, alt. ca. 1300 m. (2617)

Mt. Pateras, E slopes of the summit Liondari, 38°06'N 23°20'E, alt. ca. 1050 m. (1862); NW of Psatha, 38°07'N 23°14'E, alt. ca. 380 m. (1330); SW slopes, 38°06'N 23°16'E, alt. ca. 550 m. (2301).

**Koeleria lobata** (Bieb.) Roemer & Schultes

Mt. Kitheron, S of the monastery of Agia Triada, 38°11'N 23°14'E, alt. ca. 560 m. (3662).

**Molinia coerulea** (L.) Moench

Mt. Gerania, W slopes, S of Mazi, ophiolithic substrate, 38°02'N 23°05'E, alt. ca. 520 m. (2678).

**Narduroides salzmanii** (Boiss.) Rouy

Mt. Gerania, between Mazi and Schinos, ophiolithic substrate, 38°02'N 23°05'E, alt. ca. 520 m. (2439); between Mavrolimni and Pefkogiali, 38°03'N 23°07'E, alt. ca. 50 m. (3245).

To our knowledge, this is the first report of the species on the Greek mainland. It was previously reported by CANDARGY (1897) from the island of Lesvos; its presence there was questioned by RECHINGER (1943), but confirmed recently by HANSEN & NIELSEN (1993). It was also reported by RECHINGER (1961) from Evvia. On Mt. Gerania it was found growing in perfectly natural habitats and always on serpentine. This species, undoubtedly rare in Greece, must be looked for in other serpentine areas further north.

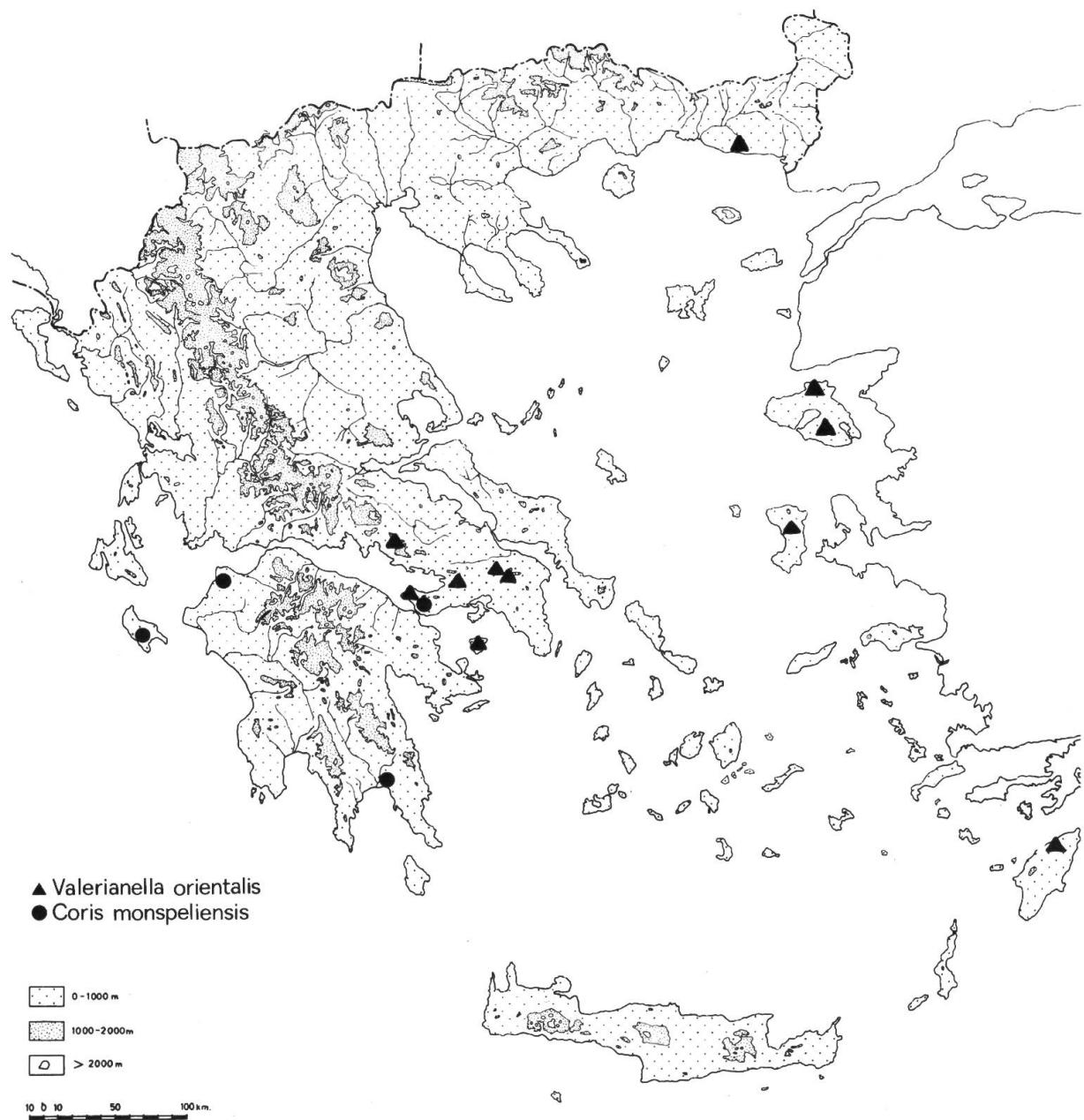


Fig. 3. – Known geographical distribution of *Valerianella orientalis* and *Coris monspeliensis* in Greece.

**Phalaris aquatica L.**

Mt. Gerania, W slopes, S of Mazi, 38°02'N 23°06'E, alt. ca. 450 m. (2569).

**Phalaris brachystachys Link**

Mt. Gerania, ca. 1 km W of Pissia, 38°01'N 23°00'E, alt. ca. 600 m. (3266).

**Phalaris minor Retz.**

Mt. Gerania, between Schinos and Pissia, 38°02'N 23°00'E, alt. ca. 500 m. (3184).

**Poa pratensis L. subsp. *attica* (Boiss. & Heldr.) Rech. fil.**

Mt. Pateras, N of Korona summit, 38°06'N 23°15'E, alt. ca. 420 m. (1625).

**Sesleria taygetea Hayek**

Mt. Kitheron, close to the summit Profitis Ilias, 38°10'N 23°15'E, alt. ca. 1200 m. (s. n.).

*S. taygetea*, a Greek endemic grass, was until now known only from localities in S Peloponnisos (GUSTAVSSON, 1991). Its occurrence on Mt. Kitheron extends its distribution limits to the north and as far as we know this is the first record of the species from Sterea Ellas. The species grows in small numbers close to the main summit of the mountain and is subject to heavy grazing which makes development of inflorescences difficult.

*Liliaceae***Allium chamaemoly L. subsp. *chamaemoly***

Mt. Gerania, ca. 1 km W of Pissia, 38°01'N 22°59'E, alt. ca. 500 m. (2856); N parts of the summit Megali Douskia, 38°01'N 23°02'E, alt. ca. 800 m. (4392).

Mt. Kitheron, E part, between the summits Malliara and Tris Korifes, 38°11'N 23°19'E, alt. ca. 850 m. (4305).

*A. chamaemoly* subsp. *chamaemoly* occurs in a few localities in Greece (WILDE-DUYFJES, 1976; TZANOUDAKIS & VOSA, 1988; SPETA, 1989), mainly at low altitudes. Recently, PHITOS & al. (1989) reported the discovery of a population on Mt. Lambia (Peloponnisos) at an altitude of ca. 1000 m., thus extending the altitudinal range of the species. Our collections from Mts. Gerania and Kitheron are all from 500 m and above. The plants flower on grassy slopes occasionally near snow together with *Crocus* spp., in populations of a few hundred individuals. The small habit of *A. chamaemoly* and its early flowering period (November – March) may be responsible for the scarce information regarding its existence on other montane areas.

**Bellevalia cf. *ciliata* (Cyr.) Nees**

Mt. Gerania, between Schinos and Pissia, 38°01'N 23°00'E, alt. ca. 500 m. (3147).

Mt. Kitheron, ca. 1.5 km SW of Kapareli, 38°13'N 23°12'E, alt. ca. 450 m. (2984); Kaza, between Kitheron and Pastra, 38°11'N 23°20'E, alt. ca. 550 m. (4513).

FEINBRUN (1940) and WENDELBO (1984) consider colour of buds and flowers as very important characters for an accurate determination of the species and describe flower buds of *B. ciliata* as being violet or lilac. All the material collected on the mountains under investigation, however, as well as additional living material from elsewhere in Greece clearly shows white buds. More detailed studies *in situ* are desirable.

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