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The flora of Mount Boumistos (NW Sterea Ellas, Greece): Species list and chorological notes

Abstract

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The vascular flora of Mt Boumistos, part of Akarnanika Ori, comprises 502 taxa. Of these, 401 are recorded for the mountain for the first time, 31 are Greek and 32 Balkan endemics. Among the Greek endemic taxa, three (*Cerastium illyricum* subsp. *crinitum, Galanthus reginae-olgae* subsp. *vernalis, Allium callimischon*) are new records for the study area, two (*Mentha pulegium* subsp. *cephalonia* and *Scutellaria rupestris* subsp. *cephallonica*) are new additions to the flora of the Greek mainland and one is a local endemic (*Campanula garganica* subsp. *acarnanica*). *Avena lusitanica* and *Melica cupanii* are reported as new for the Greek flora. The flora of Mt Boumistos is divided into 21 chorological groups and 22 subtypes of 6 main life forms. The high proportion (36.6%) of therophytes and prevalence of the Mediterranean element in its broad sense (57.5%) confirm the Mediterranean nature of the flora of the study area. The relatively high percentage of geophytes (15.1%) seems to be associated with the presence of man.

Introduction

A considerable number of botanical investigations on Greek mountains has been carried out recently. High mountains attract the main interest, and as a consequence many lower ones still remain unexplored or incompletely explored as to their flora and vegetation. Mount Boumistos belongs to the latter category. It is a low mountain of NW Sterea Hellas, its highest peak reaching 1577 m. It is part of the Akarnanika Ori, an extensive mountain range of Etolo-Akarnania prefecture. Although several botanists have visited the mountain and collected plant material (Maire & Petitmengin, Damboldt, Phitos & Kamari, et al.), the inventories of its flora and vegetation remain so far unpublished.

Although the mountain presents a particular phytogeographical interest because of its geographical position, previous phytogeographical conclusions have not been based on the analysis of its flora as a whole. Ths is because its phytogeographical position is treated

under different phytogeographical regions of Greece (Strid 1986: XVII, Strid 1993: 414, Phitos & al. 1995: XXIV, Phitos & al. 1997: XII).

The present contribution is part of a Master thesis undertaken by the first author at the University of Patras. It forms the basis for a phytogeographical analysis of the flora of Mt Boumistos, which will appear as a future second contribution.

This paper's primary goal is to provide a reasonably complete account of the flora of Mt Boumistos. This fits into the larger-scale surveys of the international "Flora Hellenica" and "Euro+Med PlantBase" Projects, currently in progress, in which the Botanical Institute of Patras University participates. The knowledge of the flora and vegetation of Mt Boumistos also contributes to the mountain flora of Sterea Hellas, an area of research involving several botanists at Patras University and elsewhere (Dimitrellos & Christodoulakis 1995, 1999, Constantinidis & Yanitsaros 1996, Constantinidis 1997, Vlachos 1996, Kokmotos 1999, Karetsos 2002).

The most important references to the flora of Mt Boumistos can be found in the works "Conspectus Florae Graecae" (Halácsy 1901-1904) and especially in the two supplements (Halácsy 1908 & 1912), where the specimens of Maire & Petitmengin (1908) from their exploration of Mt Boumistos (10 July 1906), have been included. The "Mountain flora of Greece" (Strid 1986, Strid & Tan 1991) and "Flora Hellenica" (Phitos & al. 1997) are also used for reference.

Features of the study area

Mt Boumistos is situated in the central part of western mainland Greece (W Sterea Ellas) and belongs to the mountain range Akarnanika Ori. It is bordered by the villages of Panagoula (to the west), Palea and Nea Kompoti (to the northeast), Aetos (to the east), and Archontochori (to the south) (Fig. 1). Mt Boumistos lies approximately between 38° 41' and 38° 45' N latitude and between 21° 00' and 21° 05' E longitude. Its orientation is N-NE to S-SW, its lowest altitude is ca. 150 m and its highest 1577 m (Korphula peak). The main mountain mass is surrounded by some secondary peaks such as Profitis Ilias (1492 m), Sgouriouri (1327 m), and Kerasia (913 m).

From a geological point of view, Mt Boumistos belongs to the Adriatic-Ionian (Ionian) geotectonic zone (IGME 1983). The largest part of the mountain consists of limestones, only small areas are covered by schists or cherts (mainly to the south), and flysch formations (to the east and north). In some places, conglomerates, breccias and screes are also encountered (IGME 1986, 1987).

As a result of its altitudinal range, different climate types prevail on Mt Boumistos. Since no exact meteorological data exist, we depend on those from the nearest weather stations, Agrinio city and Levkas island. According to the ombrothermic diagram of Agrinio (Fig. 2) and Levkas (Fig. 3), as well as their xerothermic indexes (X = 82.41 and X = 84.04, respectively), the climate of both stations can be characterised as intense Meso-Mediterranean ($75 < x < 100$, UNESCO - F.A.O. 1963).

From a vegetation analysis and according to Mavrommatis (1980), it can be hypothesized that the lower parts of Mt Boumistos belong to the Meso-Mediterranean bioclimatic type, which at its northern end reaches an altitude of ca. 800 m. This bioclimatic type covers most of

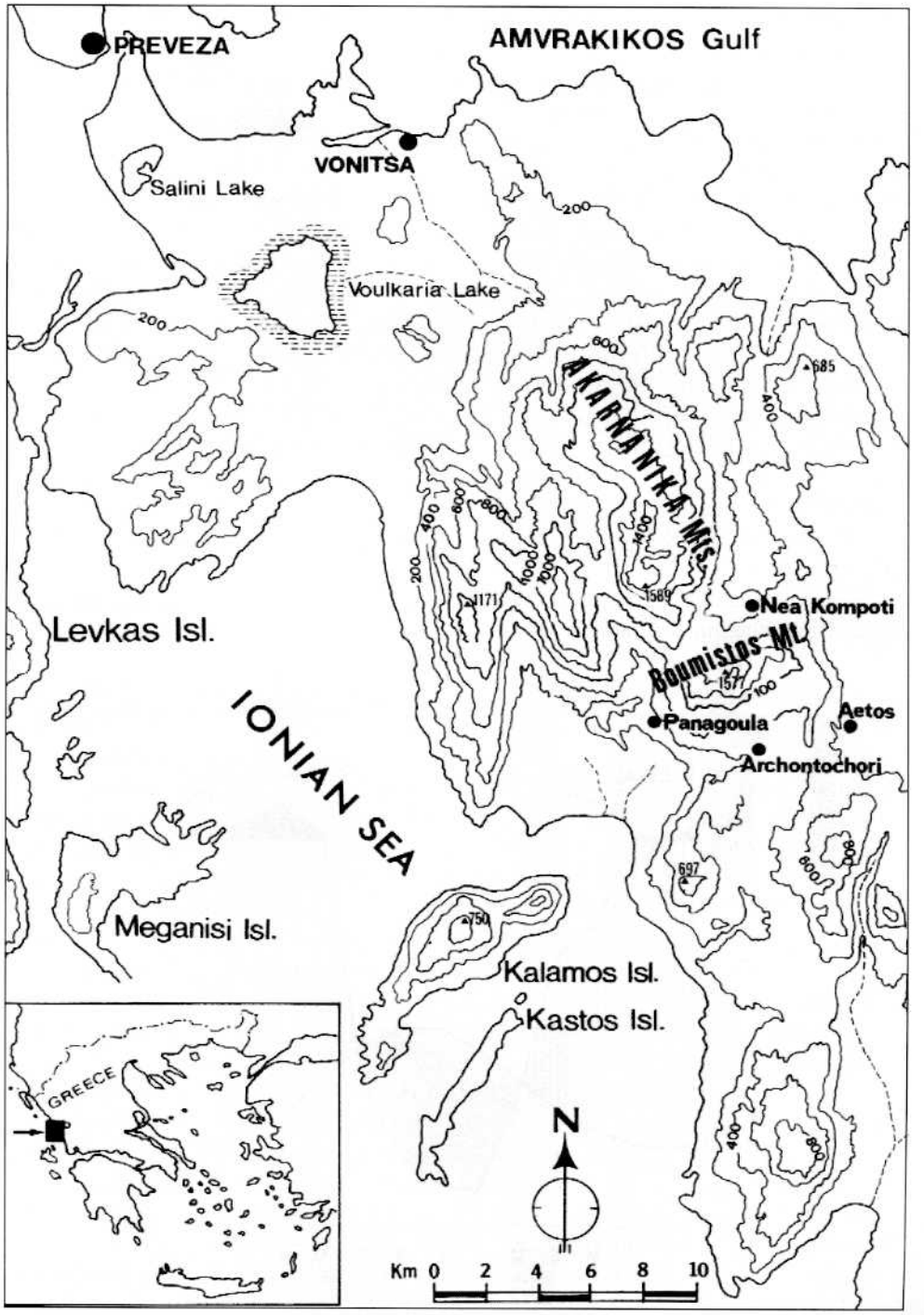

Fig. 1. Topographical map of Mount Boumistos.

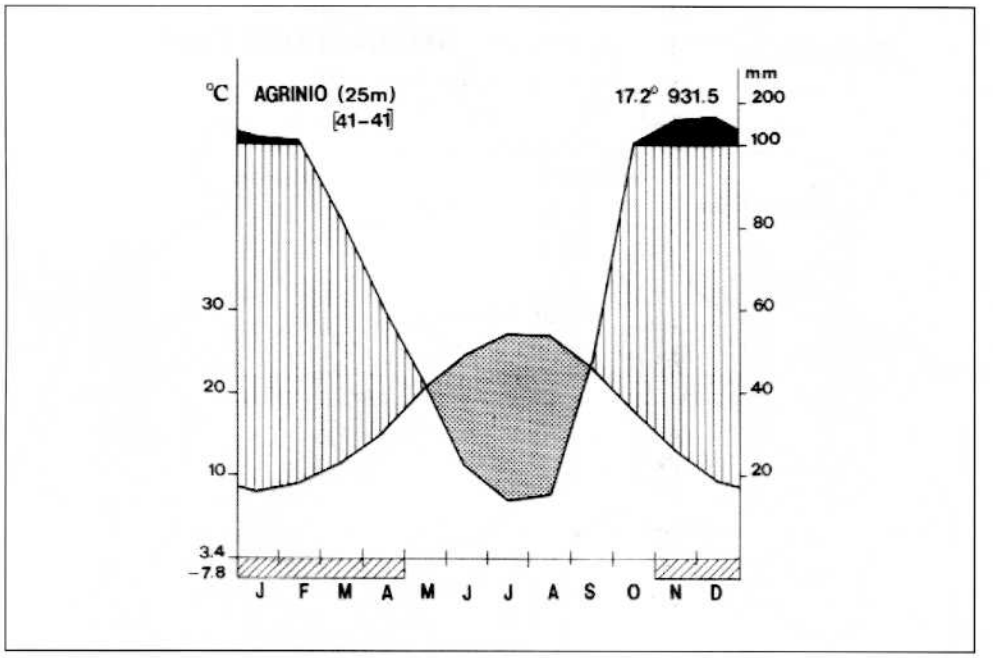

Fig. 2. Ombrothermic diagram of Agrinio city.

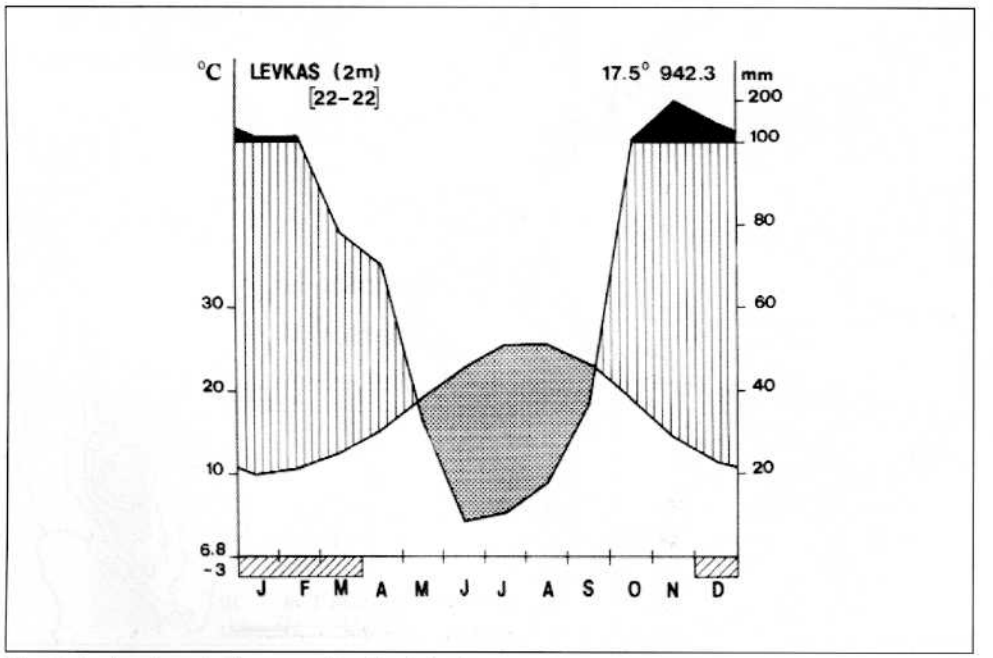

Fig. 3. Ombrothermic diagram of Levkas island.

the study area, the vegetation being characterized by the dominance of Quercion ilicis and Ostryo-carpinion formations. At altitudes of 800-1000 (-1100) m, the climate becomes mild Meso-Mediterranean, as shown by the dominant formations of Quercion confertae and also Ostryo-carpinion. At higher altitudes (> 1100 m) deciduous oak and *Abies cephalonica* formations dominate. This vegetation type suggests a Supra-Mediterranean climate.

Materials and methods

This study is based on collections and field observations made mainly by the first author from spring 1997 to summer 2000. Roughly 1000 specimens were collected during different parts of the year and from various places. Voucher specimens are deposited at the Botanical Museum of the University of Patras (UPA).

Plant nomenclature follows Flora europaea (Tutin & al. 1968-1980 and Tutin & al. 1993), Med-Checklist (Greuter & al. 1984-1989), Mountain flora of Greece (Strid 1986, Strid & Tan 1991) and Flora hellenica (Phitos & al. 1997). The life-form categories follow the system of Raunkiaer (1934). The classification of the chorological types is in accordance with Pignatti (1982), with extra information on oriental taxa provided by Davis (1965).

The plant list includes bibliographical references. The sequence of families, genera and species in the list is alphabetical.

Plant list

Abbreviations and symbols used:
Life-forms: see Table 2
Chorology: see Table 3
obs.: observation only, no herbarium specimens collected
!: herbarium specimens kept in UPA, checked by the authors, other than Vlachos's.
*: new record
Hal.: Halácsy
M. & P.: Maire & Petitmengin

PTERIDOPHYTA

Polypodiaceae

**Anogramma leptophylla* (L.) Link: Thcaesp, Cosmop.; *Vlachos 311.*

**Asplenium ceterach* L.: Hros, Paleotemp.; *Vlachos 54, Damboldt s.n.!, 104/71.*

**A. onopteris* L.: Hros, Med.-Atl.; *Damboldt 147/71!, 171/71!*

**A. trichomanes* L. subsp. *quadrivalens* D. E. Meyer: Hros, Cosmop.; *Vlachos 57.*

Dryopteris pallida (Bory) Maire & Petitmengin subsp. *pallida* (*Nephrodium pallidum* Bory): Grhiz, Eu. Med.; (M. & P. 1908: 238, Hal. 1908: 116) *Vlachos 1001.*

GYMNOSPERMAE

Cupressaceae

**Juniperus oxycedrus* L. subsp. *oxycedrus*: Phcaesp, Eu. Med.; *Vlachos 16, 28.*

Pinaceae

Abies cephalonica J.W. Loudon (*A. cephalonica* var. *apolinis* (Link) Beissner): Phscap, Greek; (M. & P. 1908: 233, Hal. 1908: 115 & 1912: 91) *Vlachos 82, 436.*

ANGIOSPERMAE

DICOTYLEDONES

Aceraceae

Acer monspessulanum L. ("*A. monspessulanum* var. *microphyllum*"): Phcaesp, Eu. Med.; (M. & P. 1908: 56) *Vlachos* obs.

Anacardiaceae

**Pistacia lentiscus* L.: Phcaesp, St. Med.; *Vlachos 86.*
**P. terebinthus* L.: Phcaesp., Eu. Med.; *Vlachos* obs.

Apiaceae

**Anthriscus tenerrima* Boiss. & Spruner: Thscap, E. Med.; *Vlachos 113, 613.*
**Bupleurum glumaceum* Sm.: Thscap, Balkan; *Vlachos 278, 345, 741.*
Eryngium amethystinum L. (*E. multifidum* Sm.); Hscap, E. Med.; (M. & P. 1908: 91, Hal. 1908: 41).
**Ferulago nodosa* (L.) Boiss.: Hscap, E. Med.; *Damboldt 140/71*!, *Vlachos 665.*
**F. sylvatica* (Besser) Reichenb. subsp. *sylvatica*: Hscap, Europ.(SE.)-S. Siber.; *Vlachos 251, 727.*
**Lagoecia cuminoides* L.: Thscap, Med.-Turan.; *Vlachos 341, 775.*
**Malabaila aurea* (Sm.) Boiss.: Hbienn, E. Med.; *Vlachos 313, 715.*
Oenanthe pimpinelloides L. (*O. incrassans* Bory & Chaub.): Hscap, Med.-Atl.; (M. & P. 1908: 95, Hal. 1908: 44) *Vlachos 605.*
**Opoponax chironium* (L.) Koch: Hscap, St. Med.; *Vlachos 1003.*
**Orlaya daucoides* (L.) Greuter: Thscap, Eu. Med.; *Vlachos 668.*
**Pimpinella peregrina* L.: Hbienn, Eu. Med.; *Vlachos 764.*
**P. tragium* Vill. subsp. *tragium*: Chsuffr, Med.-Turan.; *Vlachos 265, 800.*
Scaligeria cretica (Miller) Boiss.: Hbienn, E. Med.; (M. & P. 1908: 96, Hal. 1908: 44).
**Scandix australis* L. subsp. *grandiflora* (L.)Thell.: Thscap, Eu. Med.; *Strid & al. 29507*!, *Vlachos 140, 171, 194, 365, 408.*
**S. macrorhyncha* C.A. Meyer: Thscap, Subcosmop.; *Vlachos 666.*
Selinum silaifolium (Jacq.) G. Beck (*Cnidium silaifolium (Jacq.) Simonkai*): Hscap, Europ. (SE.); (M. & P. 1908: 94, Hal. 1908: 43, Strid 1986: 703).
**Smyrnium perfoliatum* L. subsp. *rotundifolium* (Miller) Hartvig: Hbienn, St. Med.; *Vlachos 217, 754.*
**Tordylium apulum* L.: Thscap, St. Med.; *Vlachos 342.*
**T. officinale* L.: Thscap, E. Med.; *Vlachos 172, 337, 369.*
**Torilis arvensis* (Hudson) Link subsp. *purpurea* (Ten.) Hayek: Thscap, Eu. Med.; *Vlachos 286, 398.*
**T. nodosa* (L.) Gaertner: Thscap, Med.-Turan.; *Vlachos 644.*
Turgenia latifolia (L.) Hoffm.: Thscap, Eu. Med.; (M. & P. 1908: 92, Hal. 1908: 42).

Araliaceae

Hedera helix L. subsp. *helix*: Phlian, Med.-Atl.(Eu.); (M. & P. 1908: 100) *Vlachos 83.*

Aristolochiaceae

**Aristolochia elongata* (Duchartre) Nardi: Grad, Balkan; *Vlachos 10, 54.*

Asteraceae (Compositae)

Achillea fraasii Schultz Bip.: Hscap, E. Med.; (M. & P. 1908: 115, Hal. 1908: 55, Strid & Tan 1991: 441) *Strid & al. 29510*!, *Vlachos 396.*

A. holosericea Sm.: Hscap, Balkan; (M. & P. 1908: 115, Hal. 1908: 55).

**Anthemis arvensis* L. subsp. *arvensis*: Thscap, Subcosmop.; *Vlachos 658.*

**A. chia* L.: Thscap, E. Med.; *Vlachos 7, 70, 368, 690.*

A. cretica L. subsp. *columnae* (Ten.) Franzén: Hscap, Orof. Europ. (S.); (Strid & Tan 1991: 424).

**Asteriscus spinosus* (L.) Less: Hscap, Eu. Med.; *Vlachos 760.*

Bellis perennis L.: Hros, Circumbor.; (M. & P. 1908: 111, Hal. 1908: 52) *Vlachos 48, 67, 82.*

**Calendula arvensis* L.: Thscap, Eu. Med.; *Vlachos 595, 636.*

Carduus macrocephalus Desf. ("*C. nutans*"): Hbienn, St. Med.; (M. & P. 1908: 122, Hal. 1908: 58).

Centaurea alba L. subsp. *subciliaris* (Boiss. & Heldr.) Dostál (*C. subciliaris* Boiss. & Heldr.): Hscap, Greek; (M. & P. 1908: 129, Hal. 1912: 54) *Phitos & Kamari 11311*!, *Damboldt & Matthäs 4/71*!, *Vlachos 395.*

**C. cyanus* L.: Thscap, Subcosmop.; *Vlachos 12.*

C. deustiformis Adamović: Hscap, Balkan; (Strid & Tan 1991: 506).

C. lacerata (Hausskn.) Halácsy (*C. affinis* subsp. *lacerata* (Hausskn.) Maire & Petitmengin): Hscap, Greek; (M. & P. 1908: 130, Hal. 1908: 60, Strid & Tan 1991: 499) *Vlachos 796.*

**C. spruneri* Boiss. & Heldr. subsp. *guicciardii* (Boiss.) Hayek: Hscap, Balkan; *Damboldt 112/71*!

**Chondrilla juncea* L.: Hscap, Paleotemp.; *Vlachos 842.*

**Crepis fraasii* Schultz Bip. subsp. *fraasii*: Hscap, E. Med.; *Vlachos 225.*

**C. neglecta* L. subsp. *corymbosa* (Ten.) Nyman: Thscap, E. Med.; *Vlachos 176, 303, 363, 651.*

C. neglecta L. subsp. *neglecta*: Thscap, E. Med.; (Kamari 1976: 18) *Phitos & Kamari 11300b*!, *11288*!, *11317*!, *Kamari & al. 20673*!, *Vlachos 787.*

C. rubra L.: Thscap, E. Med.; (M. & P. 1908: 136, Hal. 1912: 58) *Vlachos 137.*

**C. sancta* (L.) Bornm.: Thscap, Med.-Turan.; *Vlachos 388, 402, 654.*

**Dittrichia graveolens* (L.) W. Greuter: Thscap, Med.-Turan.; *Vlachos 890.*

**Doronicum austriacum* Jacq.: Grhiz, Orof. Europ. (S.); *Strid 29533*!

**D. columnae* Ten.: Grhiz, Orof. Europ. (SE.)-Caucas.; *Vlachos 431.*

**D. orientale* Hoffm.: Grhiz, Orof. Europ. (SE.)-Caucas.; *Vlachos 240, 625.*

**Evax pygmaea* (L.) Brot. subsp. *pygmaea*: Thrept, St. Med.; *Vlachos 709.*

**Filago pyramidata* L.: Thscap, Eu. Med.; *Vlachos 648, 779, 794.*

**Hedypnois cretica* (L.) Dum.-Courset: Thscap, St. Med.; *Vlachos 638.*

Hieracium cymosum L. subsp. *subinum*(Sebastiani) Naegeli & Peter (*H. cymosum* var. *canopilosum* Arvet-Touvet): Hscap, Europ.; (M. & P. 1908: 138, Strid & Tan 1991: 614) *Vlachos 226, 728.*

**Hypochoeris achyrophorus* L.: Thscap, St. Med.; *Vlachos 261, 281, 781.*

**H. cretensis* (L.) Bory & Chaub.: Hscap, E. Med.; *Vlachos 290, 366, 367.*

**Inula verbascifolia* (Willd.) Hausskn. subsp. *verbascifolia*: Chsuffr, E. Med.; *Vlachos 828.*

Lapsana communis L.: Thscap, Paleotemp.; (M. & P. 1908: 132, Hal. 1912: 56) *Vlachos* obs.

**Leontodon crispus* Vill. subsp. *asper* (Waldst. & Kit.) Rohlena: Hros, Europ. (SE.)-Caucas.; *Vlachos 382, 423.*