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Contribution to the study of the flora of Mount Mitsikeli, NW Greece

Abstract

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On Mount Mitsikeli, 448 plant taxa have been recorded, 169 of which are provided from bibliography. The overall taxa belong to 65 families and 239 genera. After having analyzed the life spectrum of the recorded taxa, it is evident that among the six life-form categories recorded, the Hemicryptophytes dominate with 45% while the Therophytes follow with 20%. Through the chorological analysis, several partial units of wide geographical distribution and many subunits arise. Among them the Mediterranean floristic elements prevail with 34%, reflecting a relative Mediterranean character of the local flora, whereas the Eurasiatic (29%) and the European (12%) follow. The area is quite important for regional endemism. In total 16% of the recorded taxa consist Balkan floristic elements and 15 taxa are Greek endemics.

Key words: Mountain Flora, Greece, Natura 2000.

Introduction

Mitsikeli is a mountain of medium altitude that comprises a variety of plant communities more or less modified by humans. Forest, scrub and grassland vegetation thrives in the mountain contributing to an increased biodiversity (Gerasimidis & Korakis 2005). This pattern along with diverse flora and fauna were the reasons for including the area in the Natura 2000 Network. During the implementation of the Natura 2000 inventory project a systematic recording of the flora was carried out. In this study we present and analyze floristic data collected from the field in addition to literature recordings.

Botanical exploration on Mount Mitsikeli

The earlier botanist who collected systematically on Mt Mitsikeli appears to have been Antonio Baldacci who visited the area in June 1895 and again in June 1896. His specimens are represented in several European herbaria and his recordings were published in Halácsy's floristic monograph for the area which at that time was considered as Greece (Halácsy, 1900-1904). Collections were also made by F. G. Guiol in 1928 and 1929 (material at BM), K. H. Rechinger who visited the area in May 1961 and made c. 35 collections (material deposited mostly at G) and E. Stamatiadou who made c. 10 collections on Mt Mitsikeli in May 1971 (material at ATH).

Certainly the most extensive exploration has been of P. Hartvig and his colleagues who collected c. 120 species in mid-July 1979. The specimens are deposited at C; taxa from the high altitudes of this collection have been considered for the Mountain Flora of Greece.

Investigated area

Geography – Geology. - Mount Mitsikeli is located in the region of Ipiros, northern of the city of Ioannina and lake Pamvotis. It is a characteristically straight and elongated massif spreading from NW to SE with NE and SW prevailing slope aspects. The altitude of the mountain ranges from c. 600 m at Ioannina plateau to its highest summit which is at 1816 m (Fig. 1).

Geologically, it belongs to the Adriatic-Ionian zone (Mountrakis 1985). The prevailing rock formations comprise several types of limestone while schist, flysch and quaternary deposits appear locally (Institute of Geology and Subterranean Research, 1967-1970)

Climate. - Since there is no meteorological station inside the study site, climatic data are provided from the two nearby stations, which are found in Ioannina (alt. 483 m) and Kipi (alt. 910) as well as the classification of Soulis (1994). The wider area is characterized by a terrestrial Mediterranean climate with hot and dry summers and mild winters; *i.e.* Csa and Csb according to Köppen climatic classification. However, the eastern slopes receive increased precipitation comparing to the western and the summer there is cooler (Soulis 1994).

According to Mavrommatis (1980) the bioclimate, has a sub-Mediterranean character with a dry period ranging from 0 to 40 days and the area belongs to the humid Mediterranean bioclimatic belt with harsh winters.

Vegetation. - The lower altitudes of the south-western facing slopes of Mitsikeli is the part of the mountain that has been most affected by humans. It has been deforested to a large scale centuries ago and is covered with degraded vegetation, such as evergreen or semi-evergreen low scrub (pseudomaquis) and *Phlomis fruticosa* phrygana. Altitudinal above these formations mixed communities of *Quercus coccifera* and *Carpinus orientalis* occur, with the latter more abundant towards the north. In higher altitudes the shrubby vegetation becomes sparser and *Juniperus oxycedrus* subsp. *oxycedrus* dominates. The highest levels of the mountain towards the summit are covered with anthropogenic pseudo-alpine grasslands.

In the north-eastern facing slopes of Mitsikeli the vegetation is modified to a lesser extent by humans; this area is mostly covered with high or low deciduous forests. In the lower altitudes mixed thermophilous deciduous forests occur with, depending on the site, dominant species including: *Quercus frainetto, Q. petraea* subsp. *medwediewii, Q. cerris, Ostrya carpinifolia, Carpinus betulus, Carpinus orientalis.* At the high altitudinal level pure and mixed forests with *Abies borisii-regis* and *Fagus sylvatica* subsp. *sylvatica* grow forming the treeline (Gerasimidis & Korakis 2005).

Material and methods

The specimens were collected by the authors during May and June of the years 1999 and 2000. The collected material is deposited in the Herbarium of the Laboratory of Forest

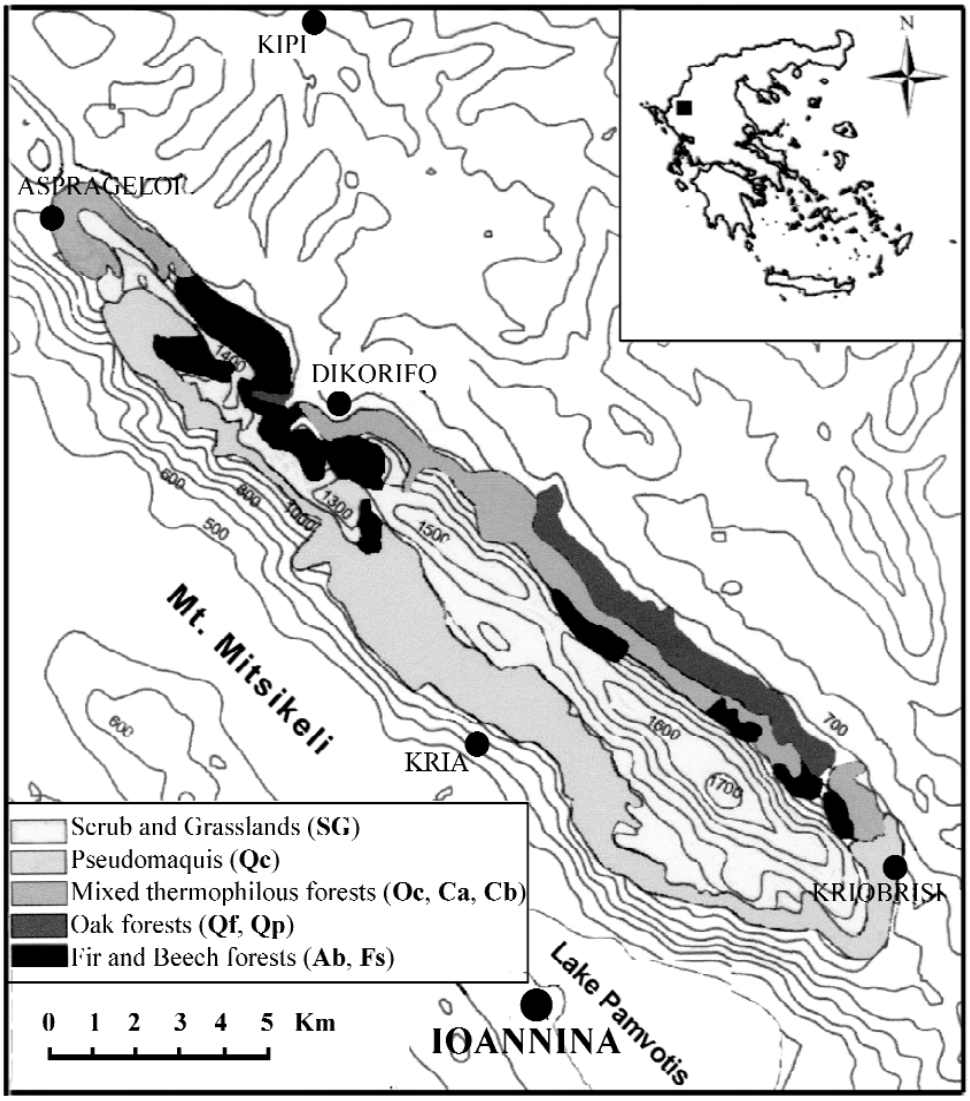

Fig. 1. Map of the Mount Mitsikeli and its main vegetation types.

Botany and Geobotany, Aristotle University of Thessaloniki (TAUF). Additionaly, for the completion of the list, certain literature references were used. These data are obtained from Chitos (2007) (92 records), Strid (1986) and Strid & Tan (1991) (77 records).

The nomenclature follows Strid & Tan (1997-2002) Greuter & al. (1984 – 1989), Strid (1986), Strid & Tan (1991), Tutin & al. (1968 - 1980, 1993). Life-form classification follows the Raunkier system and was based mainly on the works of Garcke (1972) and

Pignatti (1982). For the chorological types we used mainly Pignatti's (1982, 2005) classification. In several cases that classification was combined with chorological data derived from Tutin & al. (1968 - 1980, 1993) and data from Strid (1986) and Strid & Tan (1991, 1997-2002). In the list of taxa families, genera and species are arranged alphabetically in the major taxonomic units.

The vegetation map (Fig. 1) is based on our investigation of the habitat types for the Natura 2000 research project "Identification and description of the types of habitats in areas of interest for nature conservation". The collection localities are proportionally distributed to the dominant vegetation types in the study site. Coordinates and altitude of the collection localities in respect to the dominant vegetation type are codified in the following collection sites list.

Collection sites

Quercus coccifera scrub (Qc) :

Qc1: 39º 41′ 28′′ / 20º 53′ 48′′ – 960 m.s.l.
Qc2: 39º 43′ 38′′ / 20º 46′ 44′′ – 1040 m.s.l.
Qc3: 39º 46′ 50′′ / 20º 46′ 44′′ – 930 m.s.l.
Qc4: 39º 44′ 37′′ / 20º 49′ 36′′ – 1015 m.s.l.
Qc5: 39º 46′ 01′′ / 20º 47′ 43′′ – 935 m.s.l.

Ostrya carpinifolia thickets (Oc):

Oc1: 39º 48′ 55′′ / 20º 44′ 32′′ – 1250 m.s.l.
Oc2: 39º 46′ 44′′ / 20º 49′ 58′′ – 1000 m.s.l.
Oc3: 39º 47′ 19′′ / 20º 47′ 10′′ – 1180 m.s.l.
Oc4: 39º 49′ 51′′ / 20º 44′ 05′′ – 1080 m.s.l.
Oc5: 39º 47′ 10′′ / 20º 49′ 07′′ – 960 m.s.l.

Corylus avellana thickets (Ca):
Ca1: 39º 43′ 04′′ / 20º 55′ 33′′ – 1100 m.s.l.
Ca2: 39º 49′ 30′′ / 20º 44′ 43′′ – 1120 m.s.l.
Ca3: 39º 47′ 10′′ / 20º 47′ 54′′ – 1120 m.s.l.

Carpinus betulus forest (Cb):
Cb1: 39º 49′ 14′′ / 20º 45′ 04′′ – 1130 m.s.l.
Cb2: 39º 49′ 12′′ / 20º 45′ 21′′ – 1135 m.s.l.

Quercus frainetto forest (Qf):
Qf1: 39º 44′ 22′′ / 20º 54′ 23′′ – 890 m.s.l.
Qf2: 39º 46′ 00′′ / 20º 51′ 30′′ – 925 m.s.l.
Qf3: 39º 44′ 21′′ / 20º 54′ 04′′ – 905 m.s.l.
Qf4: 39º 44′ 36′′ / 20º 54′ 00′′ – 880 m.s.l.
Qf5: 39º 46′ 20′′ / 20º 51′ 48′′ – 815 m.s.l.
Qf6: 39º 46′ 05′′ / 20º 51′ 41′′ – 860 m.s.l.

Quercus petraea subsp. *medwediewii* forest (Qp):
Qp1: 39º 44′ 00′′ / 20º 55′ 03′′ – 910 m.s.l.
Qp2: 39º 43′ 47′′ / 20º 55′ 16′′ – 940 m.s.l.
Qp3: 39º 44′ 42′′ / 20º 53′ 10′′ – 920 m.s.l.
Qp4: 39º 44′ 48′′ / 20º 52′ 41′′ – 925 m.s.l.
Qp5: 39º 45′ 09′′ / 20º 52′ 58′′ – 900 m.s.l.

Abies borisii-regis forest (Ab):
Ab1: 39º 47′ 51′′ / 20º 46′ 30′′ – 1150 m.s.l.
Ab2: 39º 47′ 39′′ / 20º 45′ 53′′ – 1280 m.s.l.
Ab3: 39º 47′ 34′′ / 20º 45′ 52′′ – 1120 m.s.l.
Ab4: 39º 46′ 29′′ / 20º 48′ 04′′ – 1310 m.s.l.
Ab5: 39º 46′ 42′′ / 20º 47′ 47′′ – 1250 m.s.l.

Fagus sylvatica subsp. *sylvatica* forest (Fs):
Fs1: 39º 46′ 50′′ / 20º 46′ 56′′ – 1275 m.s.l.
Fs2: 39º 46′ 37′′ / 20º 47′ 24′′ – 1350 m.s.l.
Fs3: 39º 46′ 48′′ / 20º 47′ 23′′ – 1380 m.s.l.
Fs4: 39º 47′ 25′′ / 20º 47′ 12′′ – 1250 m.s.l.

Pseudo-alpine scrub and grassland formations (SG):
SG1: 39º 42′ 29′′ / 20º 53′ 44′′ – 1210 m.s.l.
SG 2: 39º 42′ 13′′ / 20º 53′ 39′′ – 1160 m.s.l.
SG 3: 39º 42′ 00′′ / 20º 53′ 49′′ – 1170 m.s.l.
SG 4: 39º 41′ 46′′ / 20º 55′ 40′′ – 1090 m.s.l.
SG 5: 39º 42′ 19′′ / 20º 53′ 42′′ – 1210 m.s.l.
SG 6: 39º 41′ 50′′ / 20º 53′ 40′′ – 1150 m.s.l.
SG 7: 39º 48′ 53′′ / 20º 44′ 55′′ – 1290 m.s.l.
SG 8: 39º 48′ 39′′ / 20º 44′ 44′′ – 1140 m.s.l.
SG 9: 39º 48′ 40′′ / 20º 44′ 37′′ – 1120 m.s.l.
SG 10: 39º 48′ 45′′ / 20º 44′ 35′′ – 1350 m.s.l.
SG 11: 39º 48′ 50′′ / 20º 44′ 50′′ – 1310 m.s.l.
SG 12: 39º 43′ 15′′ / 20º 53′ 20′′ – 1530 m.s.l.
SG 14: 39º 43′ 18′′ / 20º 53′ 28′′ – 1600 m.s.l.
SG 15: 39º 43′ 06′′ / 20º 53′ 18′′ – 1650 m.s.l.
SG 16: 39º 43′ 03′′ / 20º 53′ 14′′ – 1570 m.s.l.

Abbreviations used in the floristic catalogue:
MFG = Mountain Flora of Greece I & II, Strid (1986) and Strid & Tan (1991)
FE = Flora Epirota, Chitos (2007)

Floristic List

PTERIDOPHYTA

HYPOLEPIDACEAE
Pteridium aquilinum (L.) Kuhn subsp. *aquilinum* — G rhiz, Cosmopol. — Ca1,2; Qf1-6; Qp3,4; Qp4; Ab1,3; Fs4.

ASPLENIACEAE
Asplenium adiantum-nigrum L. — H ros, Palaeotemp. — Qc5; Ca2; Qf2,4; Qp4.
Asplenium ruta-muraria L. — H ros, Circumbor. — MFG.
Asplenium trichomanes L. subsp. *inexpectans* Lovis — H ros, Centro-SE-Europ. — Oc4,5; Cb1; Fs2.
Ceterach officinarum DC. — H ros, Eurasiat. — Qc2-5; Oc5; Ca1-3; Cb1; Fs2;SG6;SG7.

ATHYRIACEAE
Athyrium filix-femina (L.) Roth — H ros, Subcosmop. — Ca2; Cb2.
Cystopteris fragilis (L.) Bernh. -- H caesp, Cosmop. — Ca2; Cb1.

ASPIDIACEAE
Dryopteris villarii Schinz & Tell subsp. *submontana* Frazer-Jenkins & Jermy — G rhiz, Orof. S-Europ. — MFG.

GYMNOSPERMAE

PINACEAE
Abies x*borisii-regis* Mattf. — P scap, Balkan — Oc1-5; Ca3; Cb1,2; Qf2,5; Ab1-5; Fs1-4.
Pinus nigra J. F. Arnold subsp. *nigra* var. *caramanica* (Bosc ex Loudon) Rehder — P scap, NE-Eurimedit. — Qf2.

CUPRESSACEAE
Juniperus foetidissima Willd. -- P scap, Stenomedit. — Oc4;SG7-11.
Juniperus oxycedrus L. subsp. *oxycedrus* — P caesp/P scap, Eurimedit. — Qc1,3-5; Oc1,3-5; Ca1,3; Cb1; Qf2-6; Qp1,4,5; Ab4,5; Fs3,4; SG1-9,12,13.

DICOTYLEDONEAE

ACERACEAE
Acer campestre L. — P scap, Europ.-Caucas. — Qp1,4.
Acer monspessulanum L. subsp. *monspessulanum* — P caesp, Eurimedit. — Qc5; Oc1-5; Ca2; Fs4.
Acer obtusatum Waldst. & Kit. ex Willd. — P scap, SE-Europ. — Oc2,3,5; Ca1-3; Cb1,2; Qf1-6; Qp1-5; Ab1-3,5; Fs4.
Acer platanoides L. — P scap, Europ.-Caucas. — Oc2; Ab1,5.
Acer pseudoplatanus L. — P scap, Europ.-Caucas. — Ab1.

ANACARDIACEAE
Cotinus coggygria Scop. — P caesp, S-Europ.- Sudsiber. — Oc2; Qf6.

ARALIACEAE
Hedera helix L. subsp. *helix* — P lian, Eurimedit. — Oc2; Ca1-3; Cb1,2; Qf1,3; Qp4,5; Ab1; Fs4.

BETULACEAE
Carpinus betulus L. — P scap, Europ.-Caucas. — Oc1; Ca3; Cb1,2.
Carpinus orientalis Miller — P caesp, Pontic. — Qc2-5; Oc3-5; Ca1,3; Qf5,6; Qp1.
Corylus avellana L. — P caesp, Europ.-Caucas. — Oc2,5; Ca1-3; Cb1,2; Qf1,3,4; Qp4; Ab1; Fs4.
Ostrya carpinifolia Scop. — P caesp, Circumbor. — Qc4; Oc1-5; Ca2,3; Cb1; Qf2; Ab1,3-5; Fs3,4.

BORAGINACEAE
Anchusa officinalis L. — H scap, Pontic. — Qc1.
Buglossoides arvensis (L.) I.M. Johnston subsp. *gasparrinii* (Heldr. ex Guss.) Fernandes — T scap, Eurimedit. — MFG.
Buglossoides purpurocaerulea (L.) I.M. Johnston — H scap, Pontic. — Qf5,6.
Heliotropium halacsyi Riedl – T scap, Endemic — FE.
Myosotis alpestris F. W. Schmidt subsp. *suaveolens* (Waldst. & Kit.) Strid — H scap, Balkan — FE.
Myosotis arvensis (L.) Hill subsp. *arvensis* — T scap, Eurasiat. — Oc1.
Myosotis sylvatica Ehrh. ex Hoffm. subsp. *cyanea* (Boiss. & Heldr. ex Hayek) Vestergren — H scap, Stenomedit-Orient. — Qc4,5; Oc4,5; Ca1-3; Cb2; Ab1,3-5.
Onosma heterophyllum Griseb. — Ch suffr, Balkan — Qc1.
Symphytum bulbosum Schimper — G rhiz, SE-Europ.— Oc5; Ca1,2; Qf5; Qp1,2,4.

CAMPANULACEAE
Asyneuma limonifolium (L.) Janchen — H scap, NE-Eurimedit. — MFG.
Campanula patula L. — H bienn, Eurasiat. — Qc3; Ca1; Qf2; Qp4; Ab1.
Campanula persicifolia L. — H scap, Eurasiat. — Qp4.
Campanula ramosissima Sibth. & Sm. — T scap, NE-Medit.-Mont. — Qc2,3,5; Ca3SG6.
Campanula spatulata Sibth. & Sm. subsp. *spatulata* — H scap, Balkan — Qc1-5; Oc1,2,4; Ca2,3; Cb1,2; Qf1,3-5; Qp1,3-5; SG1-4,7-9,13-16.
Campanula trachelium L. — H scap, Paleotemp. — Qc5; Oc2; Ca1-3; Cb1,2; Qf4; Qp1; Ab3,5.
Campanula tymphaea Hausskn. — Ch suffr, Balkan — MFG.
Legousia speculum-veneris (L.) Chaix — T scap, Eurimedit. — Qc5.

CAPRIFOLIACEAE
Lonicera alpigena L. subsp. *formanekiana* (Halácsy) Hayek — P caesp, Orof. S-Europ. — FE.
Lonicera etrusca G. Santi — NP lian (NP caesp), Eurimedit. — Qc1,3,4;Oc1.

Lonicera periclymenum L. subsp. *periclymenum* — P lian, W-Europ. — Qc2,5; Oc2; Ca2, 3; Cb1.
Viburnum lantana L. — P caesp, S-Europ.-Sudsiber. — FE.

CARYOPHYLLACEAE
Arenaria serpyllifolia L. — T scap, Subcosmop. — Qc3.
Cerastium brachypetalum Pers. subsp. *pindigenum* (Lonsing) Sell & Whitehead — T scap, Endemic. — MFG.
Cerastium brachypetalum Pers. subsp. *roeseri* (Boiss. & Heldr.) Nyman — T scap, Eurimedit. — Qc3,4; Oc4,5; Qf,4; Qp2.
Cerastium decalvans Schlosser & Vuk. — Ch suffr, Balkan — MFG.
Cerastium glomeratum Thuill. — T scap, Eurimedit. — SG1,8-10.
Dianthus cruentus Griseb. — H caesp, Balkan — SG8.
Dianthus pinifolius Sm. subsp. *lilacinus* (Boiss. & Heldr.) Wettst. — H caesp, Balkan — SG3, 4,14,16.
Dianthus viscidus Bory & Chaub. — H caesp, Sub-Balkan — MFG.
Drypis spinosa L. — Ch suffr, Balkan — MFG.
Herniaria incana Lam. — H caesp, Eurimedit. — FE.
Herniaria parnassica Boiss. subsp. *parnassica* — H caesp, Balkan — MFG.
Holosteum umbellatum L. — T scap, Paleotemp. — FE.
Minuartia attica (Boiss & Spuner) Vierh. subsp. *attica* — Ch suffr, NE-Stenomedit. — FE.
Minuartia verna (L.) Hiern — Ch suffr, Balkan — SG1,2,7,10,15,16.
Moehringia trinervia (L.) Clairv. — T scap, Eurasiat. — Ab2,3.
Paronychia taurica Borhidi & Sikura — H scap, Stenomedit.-Nordorient. — MFG.
Petrorhagia prolifera (L.) P.W.Ball & Heywood — T scap, Eurimedit. — FE.
Petrorhagia saxifraga (L.) Link. — H caesp, Eurimedit. — FE.
Saponaria calabrica Guss. — T scap, SE-Europ. — FE.
Scleranthus perennis L. subsp. *marginatus* (Guss.) Nyman — H caesp, S-Europ.- Sudsiber. — MFG.
Silene armeria L. — T scap, Centro-Europ. — SG1,4.
Silene bupleuroides L. — H caesp, Stenomedit-Nordorient. — MFG.
Silene conica L. — T scap, Paleotemp. — FE.
Silene coronaria (L.) Clairv. — H scap, Eurimedit.-Turan. — Qf4; Qp2,4.
Silene italica (L.) Pers. subsp. *italica* — H ros, Eurimedit. — Qc2-5;Oc1-4; Ca2,3; Cb2; Qf1,3,4; Qp1,3; Ab4,5.
Silene melzheimeri Greuter — H caesp, Endemic — MFG.
Silene paradoxa L. — H ros, N-Medit.-Mont. — MFG.
Silene parnassica Boiss. & Spruner — H caesp, NE-Medit-Mont. — MFG.
Silene ungeri Fenzl — H caesp, Balkan — Qc1.
Silene viridiflora L. — H ros, S-Europ.-Sudsiber. — Qf1,2,6; Qp3-5.
Stellaria media (L.) Vill. — T rept, Cosmopol. -- Ab4.

CISTACEAE
Helianthemum nummularium (L.) Miller — Ch suffr, Europ.-Caucas. — Qc3.

COMPOSITAE
Achillea fraasii Schultz — H scap/caesp, Sub-Balkan — SG1,3.
Achillea holosericea Sibth. & Sm. — H scap, Balkan — SG7,9.
Anthemis arvensis L. — T scap, Stenomedit. — SG1,5,15,16.
Anthemis cretica L. subsp. *carpatica* (Willd.) Grieson — H scap, Orof.-SE-Europ. — FE.
Anthemis cretica L. subsp. *columnae* (Ten.) Franzen — H scap, Orof.-SE-Europ. — MFG.
Anthemis tinctoria L. subsp. *parnassica* (Boiss. & Heldr.) Franzen — H scap, Sub-Balkan — Qf2,6; Qp3.
Artemisia alba Turra — Ch suffr, N-Eurimedit. — FE.
Artemisia absinthium L. — Ch suffr, E-Medit.-Mont. — MFG.
Bellis perennis L. — H ros, Europ.-Caucas. — Qc3; Qf3.
Carduus tmoleus Boiss. subsp. *armatus* (Boiss. & Heldr.) Franco — H scap, Balkan — FE.
Centaurea cyanus L. — T scap, Stenomedit. — FE.
Centaurea epirota Halácsy — H scap, Balkan — MFG.
Centaurea graeca Griseb. subsp. *graeca* — H scap, Balkan — FE.
Centaurea lacerata (Hausskn.) Halácsy — H scap, Endemic — MFG.
Centaurea pichleri Boiss. — H scap, Stenomedit-Nordorient. —SG13-15.
Centaurea triumphettii All.— H scap, Europ.-Caucas. — MFG.
Crepis neglecta L. subsp. *neglecta* — T scap, NE-Eurimedit. — SG4,14-16.
Crepis sancta (L.) Bornm. — T scap, Eurimedit.-Turan. — SG1, 4.
Crupina vulgaris Cass. — T scap, S-Europ.-Sudsiber. — SG3,4,7.
Doronicum columnae Ten. — G rhiz, Orof.-SE-Europ. — FE.
Doronicum orientale Hoffm. — G rhiz, Orof.-SE-Europ. — Ca1; Cb1; Qf1; Qp1, 4,5; Ab1.
Filago vulgaris Lam. — T scap, Paleotemp. — FE.
Hieracium bauhini Schultes ex Besser — H scap, S-Europ.-Sudsiber. — Qc4; SG2-4, 6, 8,9.
Hieracium cymosum L. subsp. *sabinum* (Sebastiani) Nägeli & Peter — H scap, C-SE-Europ. — MFG.
Hieracium murorum L. agg. — H scap, Europ. — Oc2,3; Ca3; Cb1; Qf13,4; Ab1-3; Fs3,4.
Hieracium pannosum Boiss. — H scap, Sub-Balkan — MFG.
Hieracium pavichii Heuffel — H scap, SE-Europ. — Oc3, 5; Qf2-4,6; Qp3.
Hieracium piloselloides Vill. — H scap, Europ.-Caucas. — FE.
Lapsana communis L. — T scap, Paleotemp. — Ca2; Ab3.
Leontodon cichoriaceus (Ten.) Sanguineti — H ros, Orof. SE-Europ. — SG5.
Leontodon crispus Vill. subsp. *crispus* — H ros, S-Europ.-Sudsiber. — Qc2, 3.
Leontodon hispidus L. subsp. *hispidus* — H ros, Europ.-Caucas. — SG2, 3, 5,12-16.
Mycelis muralis (L.) Dumort — H scap, Europ.-Caucas. — Ca2; Cb1, 2; Ab1-5; Fs2.
Picris pauciflora Willd. — T scap, N-Medit-Mont. — FE.
Ptilostemon afer (Jacq.) W. Greuter subsp. *afer* — H scap, Balkan — FE.
Senecio integrifolius (L.) Clairv. — H ros, Art.-Alp.(Circum.) — FE.
Senecio squalidus L. — H bienn, Orof. C-SE-Europ. — SG13.
Senecio vulgaris L. — T scap, Eurimedit. — FE.
Tanacetum corymbosum (L.) Schultz Bip. subsp. *corymbosum* — H scap, Eurimedit. — Oc5; Qf5; Qp4, 5.
Taraxacum epirense van Soest — H ros, NE-Stenomedit.— MFG.
Tussilago farfara L. — G rhiz, Paleotemp — FE.

CONVOLVULACEAE
Calystegia sepium (L.) R. Br. subsp. *sepium* — H scand, Paleotemp.— Qp4.
Convolvulus althaeoides L. subsp. *tenuissimus* (Sibth. & Sm.) Stace — H scand, Stenomedit. — SG4, 6.
Convolvulus arvensis L. — G rhiz, Cosmopol. — SG14.
Convolvulus cantabrica L. — H scap, Eurimedit. — Qc1.

CORNACEAE
Cornus mas L. – P caesp, S-Europ.-Sudsiber. — Oc1,3-5; Ca2,3; Cb2; Qf3, 5; Qp4,5; Ab5; Fs3,4.

CRASSULACEAE
Sedum acre L. — Ch succ, Europ.-Caucas. — SG4, 6, 7, 13, 15.
Sedum annuum L. — T scap, Art.-Alp.(Europ.) — FE.
Sedum dasyphyllum L. — Ch succ, Eurimedit. — MFG
Sedum hispanicum L. — T scap, SE-Europ. — MFG.
Sedum magellense Ten. — Ch succ, E-Medit.-Mont. — MFG.
Sedum ochroleucum Chaix — Ch succ, Medit.-Mont. — Qc1.
Sedum rubens L. — T scap, Eurimedit.-Subatl. — Qc4.
Sedum urvillei DC. — Ch succ, E-Medit.-Mont. — SG1,2.
Sempervirum marmoreum Griseb. — Ch succ, SE-Europe — FE.
Umbilicus luteus (Hudson) Webb & Berthel. — G bulb, E-Medit.-Mont. — Qc5; Cb1.

CRUCIFERAE
Aethionema saxatile (L.) R. Br. subsp. *oreophilum* Andersson et al. — Ch suffr, NE-Stenomedit. — Qc1,5; SG7,8.
Alliaria petiolata (M. Bieb.) Cavara & Grande — H scap, Paleotemp — Ab3.
Alyssum alyssoides (L.) L. — T scap, Eurimedit. — FE.
Alyssum montanum L. subsp. *repens* (Baumg.) Schmalh. — Ch suffr, Europ.-Caucas. — Qc1;SG1,3,7,10,12,14.
Alyssum murale Waldst. & Kit. — Ch suffr, Balkan — SG5.
Arabis alpina L. subsp. *caucasica* (Wild.) Briq. — H scap, Art.-Alp (Eurasiat.) — FE.
Arabis auriculata Lam. — T scap, Orof. S. Europ. — FE.
Arabis glabra (L.) Bernh. — H bienn, Art-Alp. — SG5,14-16.
Arabis sagittata (Bertol.) DC. — H bienn, SE-Europ. — Qc1,3,5; Ca3.
Barbarea bracteosa Guss. — H scap, Stenomedit. — MFG.
Cardamine graeca L. var. *graeca* — T scap, N-Medit.-Mont. — Qc5; Ca1; Ab3,4.
Clypeolata jonthlaspi L. — T scap, Stenomedit. — FE.
Draba lasiocarpa Rochel subsp. *lasiocarpa* — Ch pulv, Sub-Balkan — MFG.
Erophila verna (L.) Chevall. — T scap, Circumbor. — FE.
Erysimum cephalonicum Polatschek — H scap, Endemic — MFG.
Erysimum linariifolium Tausch — H scap, Balkan — Qc1.
Erysimum microstylum Hausskn. — H scap, Balkan — SG1,2,9,15,16.
Fibigia clypeata (L.).Medicus — H scap, NE-Stenomedit. — Qc2.
Hornungia petraea (L.) Reinbach. — T scap, Eurimedit. — FE.

Isatis tinctoria L. — H bienn, Avv. Naturalizz. — FE.
Malcolmia orsiniana (Ten.) Ten. subsp. *angulifolia* (Boiss. & Orph.) Stork — H bienn, Balkan — SG1,2.
Thlaspi ochroleucum Boiss. & Heldr. — H scap, Sub-Balkan — Ca2.
Thlaspi rivale C. Presl — H scap, NE-Medit-Mont. — MFG.

DIPSACACEAE
Knautia arvensis (L.) Coulter — H scap, Eurasiat. — Qc1.

EUPHORBIACEAE
Euphorbia herniariifolia Wild. -- H caesp, NE-Medit. — FE.
Euphorbia myrsinites L. — Ch rept, S-Europ.-Sudsiber — Qc1;SG1,3,4,6,7,9,10,12-16.
Euphorbia seguierana Necker subsp. *niciciana* (Borbás) Rech. — H scap, Eurimedit. — FE.

FAGACEAE
Castanea sativa Miller — P scap, SE-Europ. — Oc2,5; Fs4.
Fagus sylvatca L. subsp. *sylvatica* — P scap, Centro-Europ. — Ab3; Fs1-4.
Quercus cerris L. — P scap, Eurimedit. — Qf1,3,4; Qp2.
Quercus coccifera L. — P caesp, W-Stenomedit. — Qc1-5;Oc1,3,4; Ab5.
Quercus frainetto Ten. — P scap, SE-Europ. — Oc2-5; Ca3; Qf1-6; Qp1,2,4,5; Fs4.
Quercus petraea Liebl. subsp. *medwediewii* (A. Camus) Menitsky — P scap, SE-Europ. — Cb2; Qf1,2; Qp1-5.
Quercus pubescens Willd. — P scap, SE-Europ. — Os1,3-5; Qf5; Fs4.

FUMARIACEAE
Corydalis densiflora J. & C. Presl – G bulb, Centro-Europ. — MFG.
Corydalis solida (L.) Swartz. — G bulb, Centro-Europ. — FE.

GENTIANACEAE
Centaurium erythraea Rafn — H bienn, Paleotemp. — Qf2.

GERANIACEAE
Erodium cicutarium (L.) L' Her. — T caesp, Subcosmop. —SG8,14.
Geranium lucidum L. — T scap, Eurimedit. — Ab2-4;SG5,8.
Geranium macrorrhizum L. — G rhiz, Orof. SE-Europ. — MFG.
Geranium pusillum Burm. — T scap, Eurasiat. — Qc3,5; Ca2.
Geranium robertianum L. — T scap, Subcosmop. — Qc1,2,4,5; Ca2; Ab5.
Geranium sanguineum L. — H scap, Europ-Caucas. — SG5.
Geranium subcaulescens L' Her. ex DC. — H ros, Orof. SE-Europ. — MFG.

GESNERIACEAE
Ramonda serbica Pancic — H scap, Balkan — MFG.

GUTTIFERAE
Hypericum perforatum L. — H scap, Paleotemp. — Oc3; Qf1.

Hypericum rumeliacum Boiss. subsp. *apollinis* (Boiss. & Heldr.) Robson & Strid — H caesp, Balkan — Oc2.
Hypericum spruneri Boiss. — H scap, SE- Europ. — Qc3; Fs4.

JUGLANDACEAE
Juglans regia L. — P scap, Eurasiat. — Cb1,2; Fs4.

LABIATAE
Acinos alpinus (L.) Moench subsp. *meridionalis* (Nyman) P.W. Ball — Ch suffr, Orof. S-Europ. — Ps2,4,6,7,13,15.
Acinos suaveolens (Sibth. & Sm.) G. Don fil. — Ch suffr, NE-Stenomedit. — Qc1-3-5;Oc4.
Ajuga chamaepitys (L.) Schreber subsp. *chia* (Schreber) Arcangeli — T scap, Eurimedit.— Qc1.
Ajuga genevensis L. — H scap, Eurasiat. — SG1,10.
Ajuga reptans L. — Ch rept, Europ.-Caucas.— Qf5,6.
Ballota hispanica (L.) Bentham subsp. *macedonica* (Vandas) Strid & Tan -- Ch frut, Balkan. — MFG.
Calamintha grandiflora (L.) Moench — H scap, Orof. S. Europ. — Ca1.
Clinopodium vulgare L. — H scap, Circumbor. — Qc3-5;Oc2; Ca3; Qf1-6; Qp2,3; Qp4,5; Ab1.
Galeobdolon luteum Hudson subsp. *montanum* (Pers.) Dvoráková — H scap, Europ.-Caucas. — Ca1.
Lamium bifidum Cyr. subsp. *balcanicum* Velen. — T scap, Stenomedit.— FE.
Lamium garganicum L. subsp. *laevigatum* Arcangeli — H scap, Balkan — FE.
Lamium garganicum L. subsp. *pictum* Boiss. & Heldr. — H scap, Medit.-Mont. — FE.
Lamium maculatum L. — H scap, Eurasiat. — Qc5;Oc1;SG1.
Leonurus cardiaca L. H. — H scap, Avv. Naturalizz. — FE.
Marrubium velutinum Sibth. & Sm. — H scap, Endemic — MFG.
Marrubium vulgare L. — H scap, Eurimedit.-Sudsiber. — SG1,14.
Melittis melissophyllum L. subsp. *albida* (Guss.) P.W. Ball — H scap, Centro-Europ. — Qc5; Oc5; Ca1; Qf1,4; Qp1,2,4; Ab3;
Micromeria juliana (L.) Bentham ex Reichenb. — Ch suffr, Stenomedit. — Qc1,2.
Nepeta spruneri Boiss. — H scap, Balkan — MFG.
Origanum vulgare L. — H scap, Eurasiat. — Qc1,3;Oc4; Qf5.
Phlomis fruticosa L. — NP, N-Stenomedit. — Qc1;SG3,5.
Phlomis tuberosa L. — H scap, Eurasiat — SG1.
Prunella vulgaris L. — H scap, Eurimedit. — Cb2; Qf1.
Salvia argentea L. — H scap, Stenomedit. — MFG.
Salvia glutinosa L. — H scap, Eurasiat. — Ca1.
Satureja montana L. subsp. *montana* — Ch suffr, W-Medit.-Mont. — SG1-4,6,7.
Scutellaria columnae All. — H scap, NE-Medit.-Mont. — Ca3; Cb1; Qp2.
Scutellaria rupestris Boiss. & Heldr. subsp. *adenotricha* (Boiss. & Heldr.) Greuter & Burtder — H scap, Balkan — FE.
Sideritis lanata L. — T scap, Balkan — Qc1.

Sideritis montana L. — T scap, Eurimedit.-Turan. — SG2,4,7,10,14
Sideritis raeseri Boiss. & Heldr. subsp. raeseri — Ch suffr, Balkan — SG3,6-9,13.
Stachys annua (L.) L. — T scap, Eurimedit. — FE.
Stachys germanica L. subsp. *germanica* — H scap, Eurimedit. — Qc1;SG8,12.
Stachys menthifolia Vis. — H scap, Balkan — FE.
Stachys tymphaea Hausskn. — H scap, NE-Medit.-Mont. — MFG.
Teucrium chamaedrys L. subsp. *chamaedrys* — Ch rept, Eurimedit. — Qc1-5;Oc3-,5; Ca2,3; Qf3,5,6; Qp2; SG1-5,7,10,14.
Teucrium montanum L. subsp. *montanum* — Ch suffr, Orof. S-Europ — FE.
Teucrium polium L. subsp. *capitatum* (L.) Arcangeli — Ch suffr, Stenomedit. — Qc1; SG2-5,7,10.
Thymus longicaulis C. Presl subsp. *longicaulis* — Ch rept, Eurimedit — Oc1,5; Qf1;SG6,7,12-15.
Thymus praecox Opiz. — Ch rept, Centro-Europ. — FE.
Thymus striatus Vahl — Ch rept, SE-Europ. — SG13-15.
Thymus thracicus Velen. — Ch suffr, NE- Stenomedit. — MFG.

LEGUMINOSAE
Anthyllis vulneraria L. subsp. *pindicola* Cullen — H scap, Balkan — Qc2;SG5-9.
Astragalus angustifolius Lam. — Ch suffr, E-Medit.-Mont. — SG14-16.
Astragalus depressus L. — H ros, S-Europ.-Sudsiber. — MFG.
Astragalus glycyphyllos L. — H rept, S-Europ.-Sudsiber. — Oc3; Qf3; Ab1; Fs4.
Astragalus vesicarius L. — H scap, S-Europ.- Sudsiber. — MFG.
Chamaecytisus eriocarpus (Boiss.) Royhm. — Ch suffr, Balkan — FE.
Chamaecytisus hirsutus (L.) Link — Ch suffr, Eurosiber. — Oc; Qf1-4,6; Qp3-5.
Colutea arborescens L. — P caesp, Eurimedit. — Qc2-4;Oc5; Ca2,3; Qf1,5,6; Fs4.
Dorycnium hirsutum (L.) Ser. — Ch suffr, Eurimedit. — Oc4; Qf1-4; Qp3-5; SG9.
Dorycnium pentaphyllum Scop. subsp. *herbaceum* (Vill.) Rouy — Ch suffr, SE-Europ.-Sudsiber. — Oc24; Qf1-4,6; Qp1; SG8,10,11.
Hippocrepis emerus (L.) Lassen subsp. *emeroides* (Boiss. & Spruner) Lassen — NP, Centro-Europ. — Qc2;Oc3-5; Ca3.
Lathyrus aphaca L. — T scap, Eurimedit. — FE.
Lathyrus cicera L. — T scap, Eurimedit. — Qc1.
Lathyrus digitatus (Bieb.) Fiori — G rhiz, S-Europ.-Sudsiber. — FE
Lathyrus grandiflorus Sibth. & Sm. — G rhiz, NE-Stenomedit. — FE.
Lathyrus inconspicuus L. — T scap, Eurimedit. — Qc1-3.
Lathyrus laxiflorus (Desf.) O. Kuntze — H scap, S-Europ.-Sudsiber. — Os1; Ca3; Cb2; Qf1-5; Qp1-5; Ab1; Fs4.
Lathyrus niger (L.) Bernh. — G rhiz, Europ.-Caucas. — Qp1,3-5.
Lathyrus pratensis L. — H scap, Paleotemp. — Oc4
Lathyrus setifolius L. — T scap, Eurimedit — FE
Lathyrus venetus (Miller) Wohlf. — G rhiz, S-Europ.-Sudsiber. — Oc5; Ca1-3; Cb1,2; Ab1-3; Fs1,4.
Lembotropis nigricans (L.) Griseb. subsp. *nigricans* — NP, S-Europ.-Sudsiber. — Oc2; Qf2; Qp3-5.

Lotus corniculatus (Boiss. & Heldr.) Heldr. — H scap, Cosmopol. — Qc3,4; Qf3,6; Qp5;SG4,9,13.
Medicago lupulina L. — T scap, Paleotemp. — Qc3; Fs3.
Medicago minima (L.) Bartal. — T scap, Paleotemp. — Qc1;SG1.
Melilotus graecus (Boiss. & Spruner) Lassen — T scap, Endemic — FE.
Melilotus officinalis (L.) Pallas — H bienn, Eurasiat. — FE.
Ononis spinosa L. subsp. *antiquorum* (L.) Arcangeli — Ch suffr, Eurimedit. — FE.
Trifolium alpestre L. — H scap, Europ.-Caucas. — Oc2,4; Qf2; Qp3.
Trifolium angustifolium L. — T scap, Eurimedit. — Qc1; Qf6.
Trifolium arvense L. — T scap, Paleotemp. — SG6,16.
Trifolium campestre Schreber — T scap, Paleotemp. — Qc1;SG2,5,6,13.
Trifolium dalmaticum Vis. — T scap, Balkan — Qc1,3;SG3,14.
Trifolium hirtum All. — T scap, Eurimedit. — FE.
Trifolium medium L. — G rhiz, Eurasiat. — Oc1; Ab1.
Trifolium nigrescens Viv. — T scap, Eurimedit. — FE.
Trifolium ochroleucon Hudson — H caesp, Eurimedit. — Oc3; Ca3; Cb2; Qf3,5; Qp3-5; Ab4.
Trifolium parnassi Boiss. & Spruner – Ch rept, Endemic — MFG.
Trifolium patens Schreber — T rept, N-Eurimedit. — FE.
Trifolium patulum Tausch — H caesp, NE-Medit.-Mont. — Qc4; Qf1,4,6; Qp1,4,5; Ab1.
Trifolium physodes Steven ex Bieb. — H scap, Eurimedit. — Qc3;SG1,2,8,9,13.
Trifolium pignantii Fauché & Chaub. — H scap, Balkan — Qc4;Oc1-3; Ca2; Cb1; Qf1-5; Qp1-5; Ab1; Fs2.
Trigonella corniculata (L.) L. — T scap, N-Stenomedit.— FE.
Vicia cracca L. — H scap, Eurasiat. — Qc1,2; Qf4; Qp3-5;SG3.
Vicia grandiflora Scop. — H scap, S-Europ.-Sudsiber — Qc3,5; Qf3,5.
Vicia hirsuta (L.) S. F. Gray — T scap, Palaeotemp. — Qp2.
Vicia narbonensis L. — T scap, Eurimedit. — FE.
Vicia sibthorpii Boiss. — T scap, Endemic — SG3,9.
Vicia villosa Roth subsp. *varia* (Host) Corb. — T scap, Eurimedit. — Qc2,4;Oc2; Ab1-3; Fs1.

LINACEAE
Linum tenuifolium L. — S-Europ.-Sudsiber. — MFG.

LORANTHACEAE
Viscum album L. — P ep, Eurasiat. — Ab1-4; Fs1,2.
Loranthus europaeus Jacq. — P ep, Europ.-Caucas. — Oc2; Qf2-4,6; Qp1,4.

MALVACEAE
Malva neglecta Wallr. — T scap, Paleotemp. — MFG.

OLEACEAE
Fraxinus ornus L. — P scap, Eurimedit.-Pont — Qc2,4,5; Oc1,2,5; Ca3; Qf1,5,6; Qp1-5.

ONAGRACEAE
Epilobium lanceolatum Seb. & Mauri — H scap, Europ.-Caucas. — FE.

Epilobium montanum L. — H scap, Eurasiat. — Ab5.

OROBANCHACEAE
Orobanche alba Stephan ex Willd. — T par, Eurasiat. — MFG.
Orobanche lavandulacea Reich. — T par, W-Stenomedit. — Qc5.
Orobanche pubescens D'Urv. — T par, Stenomedit. — FE.
Orobanche reticulata Wallr. — T par, Centro-Europ. — MFG.

PAPAVERACEAE
Papaver rhoeas L. — T scap, Eurimedit. —SG1.

PLUMBAGINACEAE
Armeria canescens (Host) Boiss. — H ros, Orof.-SE-Europ. — SG9,10.

POLYGONACEAE
Polygonum aviculare L. — T rept, Cosmop. — MFG.
Rumex kerneri Borbás — H scap, SE-Europ. — MFG.
PRIMULACEAE
Cyclamen hederifolium Aiton — G bulb, N-Stenomedit. — Qc5;Oc5; Ca3.
Lysimanchia punctata L. — H scap, Europ.-Caucas. — FE.
Primula veris L. subsp. *columnae* (Ten) Mair & Petitm. — H ros, N-Medit.-Mont. — FE.
Primula vulgaris Hudson — H ros, Europ.-Caucas. — Oc5; Ca1,2; Cb1; Qf1,5; Qp1-3,5; Ab1,3; Fs4.

PYROLACEAE:
Monotropa hypopitys L. — G rad, Circumbor. — Qf5 Ab3.

RANUNCULACEAE
Clematis vitalba L. — P lian, SE-Europ.-Sudsiber. — Qc2; Oc2-4; Ca2,3; Cb2; Ab1; Fs4.
Helleborus odorus Waldst. & Kit. subsp. *cyclophyllus* (A. Braun) Strid — G rhiz, Balkan — Qc3,5; Oc1,3-5; Ca1,2,3; Cb2; Qf1,3-5; Qp1,2; Ab1,3-5; Fs4.
Nigella damascena L — T scap, Eurimedit. — FE.
Ranunculus millefoliatus Vahl, — H scap, Stenomedit. — Ca1.
Ranunculus psilostachys Griseb. — H scap, Balkan — Oc1; Ca2.
Ranunculus trichophyllus Chaix, — I rad, Eurasiat. — FE.
Thalictrum minus L. subsp. *saxatile* DC. — H scap, Medit.-Atl.(Steno) — Oc1,5.

RHAMNACEAE
Frangula rupestris (Scop.) Schur — NP, NE-Medit.-Mont. — Fs4.
Rhamnus alpinus L. subsp. *fallax* (Boiss.) Maire & Petitmengin — P caesp, W-Medit-Mont. — SG13.

ROSACEAE
Agrimonia eupatoria L. subsp. *eupatoria* — H scap, Subcosmop. — Qf5.

Aremonia agrimonoides (L.) DC. — H ros, NE-Stenomedit. — Qc3,5;Oc1-5; Ca1-3; Cb1,2; Qf1,3-6; Qp1,2,4; Ab1,3-5; Fs3,4.
Cotoneaster integerrimus Medicus — NP, Eurasiat. — FE.
Cotoneaster nebrodensis (Guss.) C. Koch — NP, S-Europ.-Sudsiber. — FE.
Crataegus monogyna Jacq. — P caesp, Paleotemp. — Ca3; Qf3; Qp2; Fs4.
Crataegus orientalis Pallas ex Bieb. — NP caesp, Europ.-Caucas. — MFG.
Fragaria vesca L. — Ch rept, Eurosib. — Oc2; Ca1; Cb2; Qf2; Qp2; Ab1,2.
Geum urbanum L. — H scap, Circumbor. — Oc1,3,5; Ca1-3; Cb1,2; Qf5; Qp1,2; Ab3-5.
Malus sylvestris Miller — P scap, Centro-Europ. — Oc3,4; Qf5; Fs4.
Potentilla detommasii Ten. — H scap, SE-Europ. — SG1.
Potentilla micrantha Ramond ex DC. — H ros, Eurimedit. — Qc3-5; Oc1,4; Ca1,2; Cb1,2; Qf1-4; Qp1-4; Ab1.
Potentilla recta L. — H scap, Eurasiat. — SG6,10,14.
Potentilla reptans L. — H ros, Paleotemp. — FE.
Prunus avium L. — P scap, Pontica — Oc2,5; Qf3; Qp3,4; Fs4.
Prunus mahaleb L. — P caesp, S-Europ.-Sudsiber. — Ab2.
Prunus prostrata Labill. — NP, Paleotrop. — MFG.
Prunus spinosa L. — P caesp, Europ.-Caucas. — Qc3;Oc3,4; Qf5.
Rosa agrestis Savi — NP, Eurimedit. — Oc1,2.
Rosa canina L. — NP, Paleotemp. — Qc2;Oc2-4; Ca1,2; Cb2; Qf1,5; Qp1,4,5; Ab1,2; Fs3,4.
Rosa glutinosa Sibth. & Sm. — NP, NE-Medit.-Mont. — FE.
Rosa pulverulenta Bieb. — P caesp, Medit.-Mont.-Caucas. — Oc1; Ab5.
Rubus canescens DC. — NP, Eurimedit. — Oc2; Cb1,2; Qf3,5,6; Ab1; Fs4.
Rubus hirtus Waldst. & Kit — NP, S-EC-Europ. — Ab1.
Sanguisorba minor Scop. subsp. *muricata* (Spach) Briq. — H scap, Paleotemp. — Qc3;Oc1-3,5; Ca3; Qf2,6;
Sorbus domestica L. — P scap, Eurimedit. — Oc2,4.
Sorbus torminalis (L.) Crantz — P scap, Paleotemp — Oc2; Qf1,4,5; Qp1.

RUBIACEAE
Asperula aristata L. subsp. *thessala* (Boiss. & Heldr.) Hayek — H scap, Endemic. — MFG.
Cruciata laevipes Opiz — H scap, Eurasiat. — Qc3,5; Ca2; Qf5; Qp2.
Galium aparine L. — T scap, Eurasiat. — Qc3-5; Oc2,3,5; Ca2,3.
Galium laconicum Boiss. & Heldr. — H scap, Balkan — Qc4.
Galium oreophilum Krendl — H scap, Balkan — MFG.
Galium setaceum Lam. — T scap, Stenomedit — Qc1.
Galium speciosum Krendl — T scap, Balkan — MFG.
Galium verum L. — H scap, Europ.-Caucas. — Qc4.
Valantia aprica (Sibth. & Sm.) Boiss. & Heldr. — Ch caesp, Balkan — MFG.

RUTACEAE
Ruta chalepensis L. — Ch suffr, S-Stenomedit. — FE.

SALICACEAE
Populus tremula L. — P scap, Eurosib. — Ab1.

SANTALACEAE
Osyris alba L. — NP, Eurimedit. – FE.

SAXIFRAGACEAE
Saxifraga adscendens L. subsp. *parnassica* (Boiss. & Heldr.) Hayek — H bienn, Orof. S. Europ. — MFG.
Saxifraga rotundifolia L. subsp. *rotundifolia* — H scap, Orof. SE-Europ. — Ca1,2; Cb1.

SCROPHULARIACEAE
Digitalis ferruginea L. — H scap, NE-Medit.-Mont. — Ab3-5.
Digitalis grandiflora Miller — H scap, S-Europ.-Sudsiber. — Oc1,2; Ca3; Cb1,2; Qf5,6; Qp4,5.
Digitalis viridiflora Lindley — H scap, Balkan — SG9.
Euphrasia salisburgensis Funck ex Hoppe subsp. *salisburgensis* — T scap, Orof. SE-Europ. — MFG.
Pedicularis graeca Bunge — H scap, Balkan — FE.
Scrophularia laciniata Waldst. & Kit. var. *laciniata* — H scap, Balkan.— MFG.
Verbascum epixanthium Boiss. & Heldr. — H scap, Endemic — FE.
Verbascum nigrum L. — H scap, S-Europ-Subsiber. — FE.
Verbascum phlomoides L. var. *phlomoides* — H scap, Eurimedit. — SG7,14-16.
Veronica chamaedrys L. subsp. *chamaedryoides* (Bory & Chaub.) M. A. Fischer — H scap, Endemic — Qc2-4; Qf1-6; Qp2-5; Ab1,3; Fs4.
Veronica glauca Sibth. & Sm. subsp. *peloponnesiaca* (Boiss. & Orph.) Maire & Petitmengin — T scap, Balkan — MFG.
Veronica orsiniana Ten. subsp. *orsiniana* — H caesp, Orof. SE-Europ — FE.

SOLANACEAE
Hyoscyamus niger L. — T scap, Eurasiat. — FE.

TILIACEAE
Tilia tomentosa Moench — P scap, S-Europ.-Sudsiber. — Os4,5; Ca3; Cb1,2; Qp4.

THYMELAEACEAE
Daphne laureola L. — P caesp, Subatlant. — Ab1,3.
Daphne oleoides Schreber — Ch frut, NE-Medit-Mont. — Qc4; Oc4; SG4,6-11.

UMBELLIFERAE
Carum graecum Boiss. & Heldr. subsp. *graecum* — H scap, Balkan — FE.
Carum multiflorum (Sibth. & Sm) Boiss. — H scap, E-Stenomedit. — MFG.
Eryngium amethystinum L. — H scap, SE-Europ.-Pontica —SG1-4,7-9.
Geocaryum pindicolum (Hausskn.) Engstrand — G bulb, Balkan — MFG.
Heracleum sphondylium L. subsp. *pyrenaicum* (Lam.) Bonnier & Layens — H scap, Paleotemp. — Qf5.
Myrrhoides nodosa (L.) Cannon — T scap, Stenomedit. — Ab4.
Opopanax hispidus (Friv.) Griseb. — H scap, E-Eurimedit. — FE.

Orlaya daucoides (L.) Greuter — T scap, Stenomedit. — Qc1,3,5; SG7.
Physospermum cornubiense (L.) DC. — H scap, Eurimedit. — Oc1,2,5; Ca2,3; Cb1,2; Qf1,2,4,5; Qp1,2; Ab1-3; Fs4.
Sanicula europaea L. — H scap, Paleotemp. — Cb1; Ab1.
Scandix australis L. subsp. *grandiflora* (L.) Thell. — T scap, Stenomedit. — SG7,14-16.
Trinia glauca (L.) Dumort subsp. *pindica* Hartvig — H scap, Balkan — MFG.

ULMACEAE
Ulmus glabra Hudson — P scap, Europ.-Caucas. — Ab1.

URTICACEAE
Urtica dioica L. — H scap, Subcosmop. — Ca2,3; Ab2,4; Fs2.

VALERIANACEAE
Valeriana tuberosa L. — H scap, Medit.-Mont — FE.
Valerianella coronata (L.) DC. — T scap, Eurimedit. — MFG.
Valerianella locusta (L.) Laterrade — T scap, Eurimedit. — FE.

VIOLACEAE
Viola alba Besser — H ros, Eurimedit. — Qc3,5; Oc3-5; Ca2.
Viola epirota (Halácsy) Raus — H scap, Endemic — MFG.
Viola odorata L. — H ros, Eurimedit. — Cb2.
Viola reichenbachiana Jordan ex Boreau — H scap, Eurosib. — Qf5,6; Qp2,4,5; Ab1-3.
Viola tricolor L. subsp. *macedonica* (Boiss. & Heldr.) A. Schmidt — H scap, Balkan — SG7.

MONOCOTYLEDONEAE

ARACEAE
Arum maculatum L. — G rhiz, Centro-Europ. — Ca2.

CYPERACEAE
Carex distachya Desf. — H caesp, Stenomedit. — Qc2,3.
Carex flacca Schreber — G rhiz, Europ. — Qc3; Qf1,6; Qp2.
Carex muricata L. — H caesp, Eurasiat. — MFG.

GRAMINEAE
Aegilops neglecta Req. ex Bertol. — T caesp, Eurimedit.-Turan. — SG5.
Agrostis stolonifera L. — Ch rept, Circumbor. — MFG.
Alopecurus gerardii Vill. — H caesp, Medit.-Mont. — FE.
Alopecurus pratensis L. — H caesp, Eurosib. — FE.
Anthoxanthum odoratum L. — H caesp, Eurasiat. — Qc4; Qf6; Qp5; SG3-6.
Avena barbata Pott subsp. *barbata* — T scap, Eurimedit. — FE.
Avena sativa L. — T caesp, Avv. Naturalizz. — Qc1.
Brachypodium pinnatum (L.) P. Beauv. — H caesp, Eurasiat. — Cb1; Qp2; SG1,7,8,13.

Brachypodium sylvaticum (Hudson) P. Beauv. subsp. *sylvaticum* — H caesp, Paleotemp. — Ca2,3; Cb2; Qf3-6; Qp2.
Bromus cappadocicus Boiss. & Balansa subsp. *lacmonicus* (Hausskn.) P.M. Smith — H caesp, Balkan — MFG.
Bromus squarrosus L. — T scap, Paleotemp. — Qc1; SG1,5-7.
Bromus tectorum L. — T caesp, Paleotemp. — FE.
Cynosurus echinatus L. — T caesp, Europ.-Caucas. — Qc1,3; SG5-7.
Dactylis glomerata L. subsp. *glomerata* — H caesp, Paleotemp. — Qf1-5; Qp1-5; Fs4; SG4,6,8-11.
Dasypyrum villosum (L.) P. Candargy — T scap, Eurimedit.-Turan. — SG4,16.
Festuca koritnicensis Hayek & Vetter — H caesp, Balkan — MFG.
Festuca valesiaca Schleicher ex Gaudin — H caesp, S-Europ.-Sudsiber. — Oc3; Ca2,3; Qf1,4; Qp1-3,5.
Festuca varia Haenke — H caesp, Orof. S-Europ. — Qc1-4; Oc2,4,5; Qf2,5,6; Ab4; SG1,2,8.
Helictotrichon aetolicum (Rech.) Holub — H caesp, Balkan — MFG.
Helictotrichon convolutum (C. Presl) Henrard — H caesp, NE-Medit.-Mont. — Qc2-4; SG3-6.
Koeleria lobata (Bieb.) Roemer & Schultes — H caesp, Medit.-Mont. — SG7,11.
Lolium rigidum Gaudin subsp. *rigidum* — T scap, Subtrop. — Qc3.
Melica uniflora Retz — H caesp, Paleotemp. — Qc5; Oc5; Ca2,3; Cb1,2; Qp1,4,5; Ab1,2,3; Fs4.
Phleum alpinum L. — H caesp, Orof.S-Europ. — MFG.
Phleum montanum C. Koch — H caesp, Europ. — Qc1.
Phleum pratense L. — H caesp, Circumbor. — SG1-3,7,8.
Poa bulbosa L. — H caesp, Paleotemp — Qc3,4; Oc2,5; Ca1-3; Qf3; Ab4; SG5,7-11.
Poa nemoralis L. — H caesp, Circumbor. — Qc3,4; Oc1-3; Ca3; Cb1,2; Qf2,4; Qp2-5; Ab4,5.
Poa thessala Boiss. & Orph. — H caesp, Balkan — MFG.
Poa timoleontis Heldr. ex Boiss. — H caesp, Stenomedit. — MFG.
Poa trivialis L. subsp. *sylvicola* (Guss.) H. Lindb. Fil. — H caesp, Eurasiat. — Ab4.
Stipa bromoides (L.) Dörfler — H caesp, Stenomedit — Qf5.
Stipa pennata L. subsp. *pulcherrima* (C. Koch) Freitag — H caesp, S-Europ.-Sudsiber. — SG2,4,7,14-16.
Trisetum flavescens (L.) P. Beauv. subsp. *tenue* (Hackel ex Form.) Strid — H caesp, Stenomedit. — MFG.

JUNCACEAE
Luzula forsteri (Sm.) DC. — H caesp, Eurimedit. — Oc1,2,5; Ca2; Qf1-3,5,6; Qp1-5; Ab1.
Luzula luzuloides (Lam.) Dandy & Wilmott — H caesp, Centro-Europ. — Ab3.

LILIACEAE
Allium amethystinum Tausch – G bulb, E-Medit-Mont. — FE
Allium ampeloprasum L. — G bulb, Stenomedit. — FE.
Allium flavum L. subsp. *flavum* — G bulb, Eurimedit. — FE.

Allium guttatum Steven subsp. *sardoum* (Moris) Stearn — G bulb, Stenomedit. — MFG.
Asparagus acutifolius L. — NP, Stenomedit. — Qc1,2,4,5;Oc3.
Asphodeline lutea (L.) Reichenb. — G rhiz, E- Eurimed. — FE.
Fritillaria montana Hoppe ex Koch — G bulb, N-Medit.-Mont. — SG9.
Fritillaria thessala (Boiss.) Kamari subsp. *ionica* (Halácsy) Kamari — G bulb, Endemic — MFG.
Muscari comosum (L.) Miller — G bulb, Eurimedit. — Qc2; Oc1,5; Ca1,2; Fs4.
Muscari neglectum Guss. — G bulb, Eurimedit. — SG6,8,15,16.
Ornithogalum oligophyllum E.D. Clarke — G bulb, Balkan — FE.
Ruscus aculeatus L. — Ch frut, Eurimedit. — Qc3,5.
Tamus communis L. — G rad, Eurimedit. — Ca3.
Tulipa australis Link — G bulb, Eurimedit. — FE.
Veratrum album L. — G rhiz, Eurasiat. — MFG.

ORCHIDACEAE
Anacamptis pyramidalis (L.) L.C.M. Richard — G bulb, Eurimedit.— SG4.
Cephalanthera damasonium (Miller) Druce — G rhiz, Eurimedit. — Oc5; Qp4; Fs4.
Cephalanthera longifolia (L.) Fritsch — G rhiz, Eurasiat. — Fs4.
Cephalanthera rubra (L.) L.C.M. Richard — G rhiz, Eurasiat. — Oc5; Ca3; Cb1,2; Qf1,2,4-6; Qp2,5; Ab3; Fs1-4.
Dactylorhiza saccifera (Brongn.) Soó — G bulb, Palaeotemp. — Oc2; Ab1.
Epipactis atrorubens (Bernh.) Besser — G rhiz, Europ.-Caucas. — Qc2.
Epipactis helleborine (L.) Crantz — G rhiz, Palaeotemp. — Qc4; Ab3; Fs1,3,4.
Epipactis microphylla (Ehrh.) Swartz — G rhiz, Europ.-Caucas. — Ab3.
Limodorum abortivum (L.) Swartz — G rhiz, Eurimedit. — Qf5.
Neottia nidus-avis (L.) L.C.M. Richard — G rhiz, Eurasiat. — Qf5; Ab3; Fs1-3.
Ophrys helenae Renz — G bulb, Endemic — FE.
Orchis morio L. — G bulb, Europ.-Caucas. — FE.
Orchis provincialis Balbis — G bulb, Stenomedit. — FE.
Platanthera chlorantha (Custer) Reichenb. — G bulb, Eurosib. — Ab1.

Spectra and notes on the floristic catalogue

The so far known flora of Mount Mitsikeli comprises 448 plant taxa (356 species and 92 subspecies). These include 8 Pteridophyta, 4 Gymnospermae and 436 Angiospermae and belong to 65 families and 239 genera. The most represented families are *Leguminosae* (49 species, 11%), *Labiatae* (42 species, 9,4%), *Compositae* (41 species, 9,2%), *Gramineae* (34 species, 7,6%), *Caryophyllaceae* (31 species, 7,0%), *Rosaceae* (26 species, 5,8%), and *Cruciferae* (22 species, 5%).

The detailed bio-spectrum of the flora is presented in Table 1 while the life forms summarized are presented in Fig. 2. The Hemicryptophytes (45 %) dominate due to the altitudinal influence and the montane character of the area, whereas the substantial occurrence of Therophytes (20%) reflects a significant sub-Mediterranean influence. The presence of the latter group has been doubtless favoured with the locally extensive devastation of the

Table 1. Life-form data of the recorded flora of Mt Mitsikeli.

Life-forms	Number of taxa	%
Phanerophytes (P)	**61**	**13**
Phanerophytes scapose (P scap)	23	5
Phanerophytes liane (P lian)	4	1
Phanerophytes epiphyticous (P ep)	2	0,5
Phanerophytes caespitose (P caesp)	17	3,5
Nanophanerophytes (NP)	14	3
Nanophanerophytes caespitose (NP caesp)	1	-
Chamaephytes (Ch)	**50**	**11**
Chamaephytes reptant (Ch rept)	10	2
Chamaephytes suffruticose (Ch suffr)	29	7
Chamaephytes succulent (Ch succ)	6	1
Chamaephytes pulvinate (Ch pulv)	1	-
Chamaephytes fruticose (Ch frut)	2	0,5
Chamaephytes caespitose (Ch caesp)	2	0,5
Hemicryptophytes (H)	**200**	**45**
Hemicryptophytes scapose (H scap)	117	26
Hemicryptophytes rosulate (H ros)	24	5,5
Hemicryptophytes scandent (H scand)	2	0,5
Hemicryptophytes caespitose (H caesp)	47	11
Hemicryptophytes biennial (H bienn)	10	2
Therophytes (T)	**87**	**20**
Therophytes scapose (T scap)	80	18,5
Therophytes reptant (T rept)	2	0,5
Therophytes parasitic (T par)	1	-
Therophytes caespitose (T caesp)	4	1
Geophytes (G)	**49**	**11**
Geophytes bulbous (G bulb)	21	4,5
Geophytes rhizomatous (G rhiz)	26	6
Geophytes radicigemmate (G rad)	2	0,5
Idrophytes (I)	**1**	**-**
Idrophytes radicant (I rad)	1	
Total	**448**	**100**

Table 2. Chorological data of the recorded flora of Mt Mitsikeli.

Geographical elements	Number of taxa	%
Regional endemics	**74**	**16,5**
Greek endemics	15	3,3
Balkan endemics	53	11,9
Sub-Balkan endemics	6	1,3
Mediterranean	**153**	**34,2**
Eurimedit. including Eurimedit-Turan/Pont./Subatl./Sudsiber., N/NE/E-Eurimedit.	79	17,6
Medit.-Mont. including N/NE/E/W-Medit.-Mont.	30	6,7
Stenomedit. including Stenomedit.-Or., N/NE/W-Stenomedit.	42	9,4
NE-Medit.	2	0,5
Eurasiatic	**131**	**29**
Eurasiatic s.str.	33	7,3
Europ.-Caucas.	30	6,7
Paleotemp.	33	7,3
Eurosiber.	6	1,3
S-Europ.-Sudsiber./SE-Europ.-Sudsiber.	29	6,4
European	**54**	**12,1**
Europ. s.str.	4	0,9
Centro-Europ./Centro-SE-Europ.	13	2,9
SE-Europ.	16	3,6
Orof. S-Europ./Orof. SE-Europ.	21	4,7
Subatlantic/ Mediterranean-Atlantic	**2**	**0,5**
Pontica	**4**	**0,9**
Arctic-Alpine	**4**	**0,9**
Circumboreal	**9**	**2,1**
Paleotropical – Subtropical	**2**	**0,5**
Cosmopolitan/Subcosmopolitan	**12**	**2,6**
Naturalized	**3**	**0,7**
Total	**448**	**100**

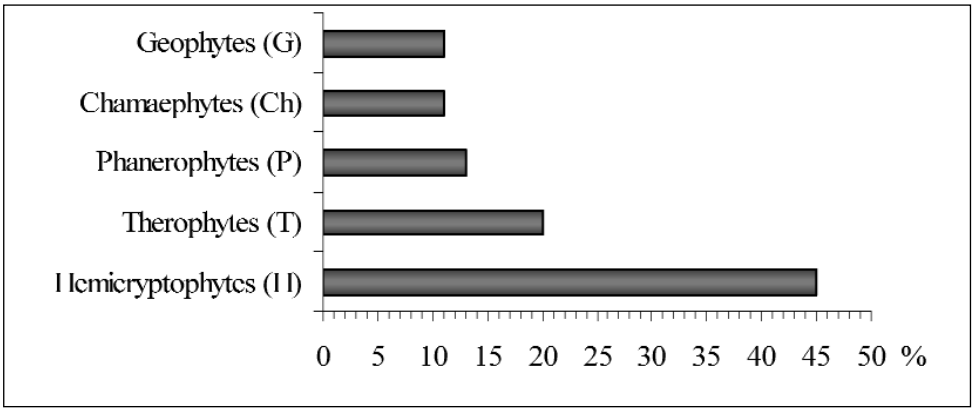

Fig. 2. Biological spectrum of the recorded flora of Mt Mitsikeli.

forest cover in the mountain, the traditional pastoral land use and site degradation especially on limestone substrate.

The chorological analysis is presented in detail in Table 2. It reveals a dominance of the Mediterranean floristic elements in the area (>34%), which include the sub-units of Euri-Mediterranean (18%), Steno-Mediterranean (9%) and oro-Mediterranean (7%). These are followed by the Eurasiatic (including Temperate), the Balkan, the European and the rest low-represented units. Balkan (including sub-Balkan) and Greek endemics in total exceed 16 % with 59 and 15 taxa respectively; it must be noted though that several of the Balkan taxa appear to have a very restricted distribution in NW Greece and just cross the borders with Albania. From the above it is obvious that Mount Mitsikeli maintains a weak Mediterranean character in which, however, the influence of European, Euroasiatic, and other non-Mediterranean elements can be clearly seen.

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