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Floristic and Phytogeographical Analysis of Mount Vermion (NC Greece)

Abstract

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This paper analyzes the Greek, Balkan, and Sub-Balkan endemic taxa present in the flora of Mount Vermion in order to define the phytogeographical connections between Mt. Vermion and other mountains and areas of Greece and the Balkan Peninsula. The chorological spectrum of the total flora, which consists of 1042 taxa, is also analyzed. Seven taxa are reported from Mt. Vermion for the first time. Compared to other mountains of the same geographical area (NC), Mt. Vermion appears to have closer phytogeographical links with Mts Olympus, Vourinos, Pieria, Voras, Varnous and Pinovo in decreasing order of floristic similarity. The analysis of Greek endemic taxa shows that Mt. Vermion has greater phytogeographical connections with Southern Greece. The impact of Balkan elements on Mt. Vermion is significant.

Introduction and study area

Mount Vermion is located in NC Greece (Fig. 1). The mountain is orientated from North to South. The highest summits of Mt. Vermion, Tsanakis (2052 m a. s. l.), Mavri Petra (2027 m), and Palati (1895 m), are located in the northern part of the mountain. Mt. Vermion is part of two large geotectonic zones: a) the Axios Zone, and b) the Pelagonian Zone (Mountrakis 1985), and its main geological substrates are limestone, flysch, schist, local serpentines and rocks of volcanic origin. The main orientation of the geological strata is NW-SW (Philippson 1930). Mount Vermion is important from a floristic and phytogeographical point of view, as it is located within the boundaries of the Mediterranean and Middle-European floristic areas.

Many partial contributions to Mt. Vermion's flora are available, such as: Ganiatsas (1939), Rechinger (1939b), Strid (1986), Strid & Kit Tan (1991). However, these do not describe adequately the flora and vegetation of the mountain. This paper is the second in a series concerning the flora of Mt. Vermion, (see also Chochliouros & Georgiadis 1997). This second paper analyses the flora of Mt. Vermion, concentrating on its endemic flora. A chorological spectrum is presented and the phytogeographical connections between Mt. Vermion and other phytogeographical areas of Greece and the Balkans are defined.

Fig. 1. Phytogeographical affinities between NC and other regions of Greece.

Materials and Methods

This study is based on the survey of 1042 wild vascular plant taxa confirmed as present on Mt. Vermion. Chochliouros & Georgiadis (1997) reported 1035 taxa while the remaining seven are reported here for the first time. Taxa nomenclature is based on the Med-Checklist (Greuter & al. 1984-1989), and Mountain Flora of Greece (Strid 1986, Strid & Kit Tan 1991). Flora Europaea (Tutin & al. 1964-1980) was also used to supplement the former publications. The *Gramineae* were determined by Prof. D. Scholz (Berlin). Chorological types are given according to Pignatti (1982), Tutin & al. (1964-1980), Strid (1986), and Greuter & al. (1984-1989). Taxa were grouped into chorological categories according to Pignatti (1982) and Walter-Straka (Walter 1970).

For the phytogeography of Greece, the divisions of Strid (1986) were used, and to determine connections between the various phytogeographical areas, only taxa with limited distributions (Greek endemics, Balkan and Sub-Balkan endemics) were examined.

The following abbreviations are used for the mountains, countries and phytogeographical regions referred to in this study:

AE	= Aegean islands	Pel	= Peloponnisos
An	= Anatolia	Pi	= Pieria
Bu	= Bulgaria	Pn	= Pinovo
Cr	= Crete	Rm	= Romania
EC	= East Central	SP	= South Pindhos
IO	= Ionian Islands	StE	= Sterea Ellas
It	= Italy	Tz	= Tzena
Ju	= Yugoslavia	Va	= Varnous
NC	= North Central	Ve	= Vermion
NE	= North East	Vo	= Voras
NP	= North Pindhos	Vu	= Vourinos
Ol	= Olympus		

Results

The flora of Mount Vermion consists of 1042 taxa, 14 of which are Pteridophytes and 1028 Spermatophytes. Their distribution per major systematic unit is given in Table 1. This had been drawn up using bibliographic references from all the researchers who have previously visited the mountain, together with the first author's collections that have resulted in 250 new taxa; 243 taxa listed in Chochliouros & Georgiadis (1997), and the following seven which are new records: *Centaurea rupestris* L. subsp. *kozanii* Routsi & Georgiadis sp. nova, *Lappula squarossa* (Retz.) Dumort., *Podocytisus caramanicus* Boiss. & Heldr., *Salvia triloba* L., *Ulmus glabra* Huds., *Quercus robur* L., *Thlaspi kovatsii* Heuff.. Of these, *Thlaspi kovatsii* is a Balkan endemic and a new record for Mt. Vermion. It was also reported recently from Mt. Pieria by Artelari (Strid & Kit Tan 2000).

For the chorological spectrum, 1042 taxa were analyzed and classified into nine categories (Fig. 2). The separation of the taxa into categories helped us to reach the following conclusions: The Mediterranean elements are the largest group being represented by 238 taxa (22.8%), followed by the European elements with 227 taxa (21.8%). Greek endemics are represented by 32 taxa (3.1%). Balkan elements are represented by 174 taxa (16.7%), including 119 Balkan endemic taxa (11.4%) and 55 Sub-Balkan taxa (5.3%). The high number of Balkan elements on Mt. Vermion is due to its phytogeographical position.

The Eurasiatic and North elements are represented by 159 (15.3%) and 99 (9.5%) taxa respectively, indicating that the northern influence on the flora of Mt. Vermion is intense. Widespread and Atlantic elements are represented by 106 (10.2%), and 7 (0.7%) taxa, respectively.

The grouping of South origin elements (Mediterranean, Greek endemics, Balkan and Sub-Balkan endemics) amounts to 42.6% of the total elements. The grouping of North origin elements (European, Europe-Asiatic and North) has 46.5%. These values indicate that Mt. Vermion lies on the border of the Mediterranean and Middle Central European regions and experiences intense northern influence.

Table 1. Vascular plant taxa in the flora of Mt. Vermion.

Systematic Unit	Families	Genera	Species	Subspecies	Species & Subspecies	Percentage (%)
Pteridophyta	6	8	13	1	14	1.4
Gymnospermae	4	5	8	4	12	1.1
Dicotyledones	69	300	646	150	796	76.4
Monocotyledones	10	84	192	28	220	21.1
TOTAL	**89**	**397**	**859**	**183**	**1042**	**100.0%**

Endemism on Mt. Vermion

To define the phytogeographical connections existing between Mt. Vermion and other mountains or geographical regions of Greece, the categories of endemic taxa were analyzed. Concerning the Greek endemics, we refer to taxa with strictly limited distributions.

The mountains Tzena, Pinovo, Voras, Varnos, Vourinos, Pieria, Vermio, and Olympus, form a mountain range with a N-S orientation that is parallel to the Pindhos mountain range. The distribution of Greek endemic taxa on mountains of the NC region and more extensive geographical regions are shown in Table 2. According to Table 2 we conclude that Mt. Vermion has stronger phytogeographical connections with the southern mountains of Olympus, Pieria, and Vourinos and less phytogeographical connections with northern mountains (Varnous, Voras, Pinovo, Tzena). This is demonstrated if we take into consideration the greatest percentage of the common Greek endemic taxa between Mts. Vermion and Olympus that reaches 34.4%. This observation confirms that of Strid (1993) where Mts. Vermion and Olympus are connected by a relatively high level of similarity at the endemic and common taxa level.

The taxon *Isatis vermia* is a local endemic of Mt. Vermion. Between Vermion and

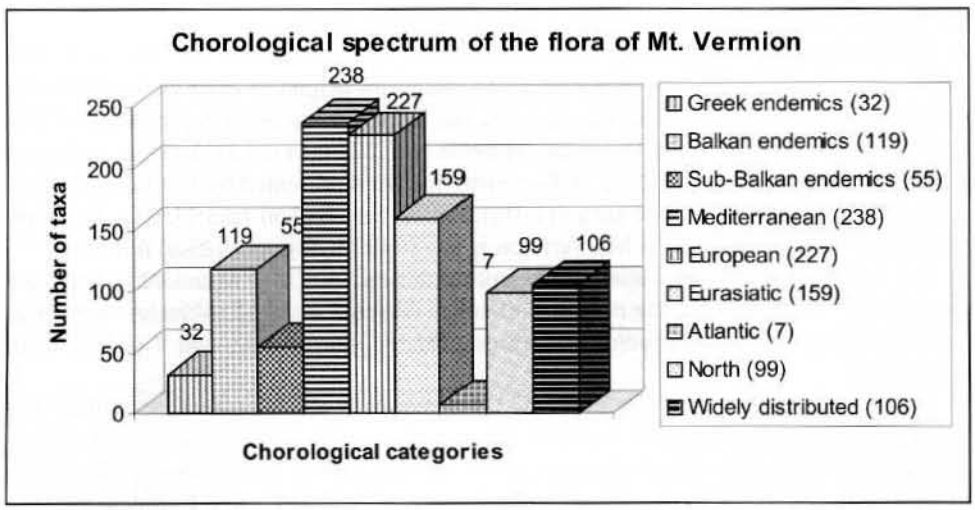

Fig. 2. Chorological spectrum of the flora of Mt. Vermion.

Olympus, seven common endemic taxa are observed, while only three common endemic taxa appear on Mt. Vourinos. This observation also agrees with Strid (1993), who gives the percentage of Greek endemics for all geographical regions.

Taking into consideration the common Greek endemic taxa (Table 2), the phytogeographical connections between Mt. Vermion and the mountains of other geographical regions, in decreasing order, are: NP (with 11 common Greek endemics), SP (9), Pel (7), NE (4), AE (3), Cr (3), EC (2). The predominance of endemic taxa in StE (17) compared to other regions can probably be explained by the detailed floristic studies that have been carried out on mountains of this region. Detailed floristic studies on mountains of North Greece are relatively few.

The Balkan Unit (Balkan and Sub-Balkan endemics)

The Balkan chorological unit demonstrates one of the most interesting and significant phytogeographical connections. The Balkan unit contains taxa distributed more widely than the Greek endemics, and are either limited to the boundaries of the Balkan area

Table 2. The Greek endemic taxa occurring on Mt. Vermion and their geographical distribution on other mountains of NC Greece and wider geographical regions.

Greek endemics	NC								NP	SP	NE	StE	Pel	EC	AE	CR
	Ve	Ol	Vu	Pi	Vo	Va	Pn	Tz								
Allium heldreichii	•	•								•		•		•		
Alyssum chalcidicum	•	•		•					•		•	•				
A. heldreichii	•		•						•							
Asperula aristata subsp. *thessala*	•	•			•		•		•	•	•	•		•	•	
Bolanthus graecus	•											•				
Centaurea affinis subsp. *pallidior*	•									•		•				
C. grisebachii subsp. *occidentalis*	•		•						•	•						
C. rupestris subsp. *kozanii*	•		•													
Cephalaria tenuiloba	•	•										•				
Cirsium mairei	•											•				
Crocus sieberi subsp. *sieberi*	•				•											•
Euphorbia deflexa	•	•							•	•	•	•	•		•	•
Isatis vermia	•															
Lysimachia serpyllifolia	•											•	•			•
Marrubium velutinum	•								•	•		•	•			
Onosma erecta	•										•					
O. kaheirei	•											•	•		•	
Polygala nicaeensis subsp. *tomentella*	•											•				
Scorzonera purpurea subsp. *peristerica*	•								•	•		•				
Silene damboldtiana	•		•	•		•			•							
S. radicosa subsp. *rechingeri*	•								•							
Stipa rechingeri	•								•							
Taraxacum albomarginatum	•	•			•								•			
T. dialeptum	•	•														
T. fibratum	•	•										•				
T. olympicola	•	•														
T. terenodes	•	•														
T. viale	•									•						
Veronica chamaedrys subsp. *chamaedryoides*	•	•		•					•	•		•	•			
V. orsiniana subsp. *teucrioides*	•	•	•									•				
Viola graeca	•	•	•										•			
V. phitosiana	•											•				
TOTAL	**32**	**13**	**6**	**3**	**3**	**1**	**1**	**0**	**11**	**9**	**4**	**17**	**7**	**2**	**3**	**3**

(Balkan endemics), or extend to bordering countries (Sub-Balkan endemics).

Of the endemic taxa (Greek 3.1% and Balkan 16.7%) the Balkan endemics appear to prevail on Mt. Vermion because of its phytogeographical position. This may be attributed to climatic and geological similarities between Mt. Vermion and the main Balkan ridge. Table 3 shows the percentages of Balkan elements present on Mt. Vermion.

Table 3 shows that the Balkan endemic group of Mt. Vermion is composed of 119 taxa, 97 of which (81.5%) are present in Yugoslavia, and 78 (65.5%) of which also occur in Albania, whereas only 53 taxa (44.5%) are found in Bulgaria. The high percentage of species present in both Greece and Yugoslavia (21 taxa) is noteworthy, followed by Albania with 15 taxa, and Bulgaria with 6 taxa. The study region is therefore closely related firstly to Yugoslavia, and secondly to Albania.

It has been ascertained that Balkan elements with a wide distribution in the Balkan region (Table 3), participate in the Mt. Vermion flora with a high percentage (26.9%, 32 taxa). Mt. Vermion's flora contains thirty taxa (25.2%) that occur in Greece, Yugoslavia and Albania and this evidence strengthens the floristic connections between Mt. Vermion, Yugoslavia, and Albania.

The distribution of Balkan taxa (Table 3) demonstrates that Mt. Vermion receives intense Balkan influence from Yugoslavia, Albania and, to a lesser degree, Bulgaria. In general, we conclude that Mt. Vermion acts as a crossroads and is influenced by two main floristic immigration currents: a) from Yugoslavia and, to a lesser degree, Bulgaria moving South, and b) from Albania spreading NE-SE.

Among the Greek-Yugoslavian endemic taxa (21 in total) there are some which have very limited distributions in the Greek mountains e.g. *Astragalus mayeri, Campanula formanekiana, Dianthus haematocalyx* subsp. *haematocalyx, Paronychia macedonica* subsp. *macedonica, Ramonda nathaliae, Stachys iva, Sesleria albicans* subsp. *angustifolia*, etc.

The distribution of common Balkan endemic taxa in the NC region and in other geographical regions (Table 4) is the following: NP: 65 taxa (54.6%), NE: 60 taxa (50.4%), SP: 56 taxa (47.1%), StE: 54 taxa (45.4%), Pel: 41 taxa (34.5%), EC: 28 taxa (23.5%), AE: 12 taxa (10.1%), IO: 8 taxa (6.7%), Cr: 2 taxa (1.7%).

The Sub-Balkan group is represented on Mt. Vermion by 55 taxa (Table 3). The species extending towards the Anatolian area (Balkan-An) are represented by 34 taxa. Some of these may not be genuine eastern elements and it is possible that they originated from northern countries via the East (Anatolia). The extension of Balkan-Anatolian taxa (Table 5) is observed more intensely in the NE region, extending to NC and it is well known that during the Miocene Balkan Peninsula was connected to NW Anatolia by the Rodhopi ridge (Kronberg & al. 1970).

Fourteen Sub-Balkan taxa occur in Italy (Balkan-It) and these taxa are also present in Yugoslavia and Albania. This confirms and strengthens the conclusion that the weak relationship between Mt. Vermion and Italy is mainly due to a northern immigration current. The northern influence on the Mt. Vermion's flora is evident and is strengthened further by its phytogeographical relationship with several mountains of northern Greece.

Conclusions and Discussion

The floristic study of Mt. Vermion with the addition of 250 new taxa, has given the

Table 3. Analysis of Balkan and Sub-Balkan endemic taxa occurring on Mt. Vermion and their distribution in the Balkans.

Categories	Number of taxa	Percentage	Distribution	Number of taxa	Percentage (%)
Balkan	119	68.4	Gr, Ju, Al, Bu	32	26.9
Sub-Balkan			Gr, Ju, Al	30	25.2
Balkan + It	14	8.0	Gr, Ju	21	17.6
Balkan + Rm	7	4.0	Gr, Al	15	12.6
Balkan + An	34	19.6	Gr, Ju, Bu	14	11.8
			Gr, Al, Bu	1	0.8
			Gr, Bu	6	5.1
TOTAL	**174**	**100.0**	**TOTAL**	**119**	**100.0%**

authors the opportunity to compare the phytogeographical connections of the mountain to other mountains and geographical areas of Greece and the Balkans.

Taking the Greek endemic taxa into consideration, the phytogeographical connections between Mt. Vermion and other mountains of NC Greece are stronger with mountains further south (Olympus, Pieria, Vourinos) than mountains to the north (Voras, Varnous, Pinovo, Tzena).

Mount Vermion and the whole NC region have received intense floristic influences from northern countries with a N-S direction. The Balkan endemics are present in a greater percentage in the NC region and NP, NE, SP, StE, Pel, EC, AE, IO and Cr follow (Table 4). The Balkan taxa make up the majority of taxa in the North and Central mainland regions.

We consider the mountains of the NC region (Voras, Pinovo, Pieria, Vermion, Olympus, Vourinos), to consist of a main ridge (the same as that of Pindhos) with a N-S direction. As we move south within the NC region, the northern floristic influence decreases, the southern point being Mt. Olympus. This also applies to mountains of other phytogeographical areas. Thus, Mt. Vermion is a floristic crossroad as it lies in the middle of the NC region.

The common Greek endemic taxa illustrate that the phytogeographical connections of Mt. Vermion with other geographical regions, in decreasing order, is the following: StE, NP, SP, Pel, NE, AE, Cr (Table 2) (see also Fig. 1). The increased number of endemic taxa in StE compared to other regions is due probably to the detailed floristic studies that have been carried out on these mountains.

The chorological spectrum of Mt. Vermion shows that the character of its flora lies on the borders of the Mediterranean and Middle European areas with an intense northern influence. However, trough floristic study of mountains from all the geographical regions would be the key to better knowledge of the phytogeographical connections between the various mountains and geographical regions of Greece.

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Table 4. The Balkan endemic taxa occurring on Mt. Vermion and their geographical distribution on other mountains of NC Greece and wider geographical regions.

BALKAN ENDEMICS	NC		NP	NE	SP	EC	StE	Pel	AE	IO
	Ve	Other mountains								
Abies borisii-regis	•	•	•	•	•			•	•	
Acer hyrcanum subsp. *intermedium*	•			•		•				
Achillea ageratifolia subsp. *aizoon*	•	•								
A. chrysocoma	•	•	•	•	•					
A. holosericea	•	•	•	•	•		•	•		
Alchemilla indivisa	•	•			•			•		
A. lanuginose	•	•	•	•						
Alkanna noneiformis	•	•			•					
Allium goulimyi	•									
Anthemis arvensis subsp. *cyllenea*	•	•	•		•		•	•		
Anthyllis aurea	•	•	•	•						
A. vulneraria subsp. *bulgarica*	•	•	•	•	•		•	•		
Aquilegia ottonis subsp. *amaliae*	•	•		•						
Arabis bryoides	•	•		•			•	•	•	
Arenaria conferta subsp. *conferta*	•	•					•	•		
Asperula purpurea subsp. *apiculata*	•	•		•	•		•			
Astragalus mayeri	•	•				•	•			
Aurinia corymbosa	•	•	•	•	•					
Avenula uetolica	•	•	•		•		•	•		
Bromus cappadocicus subsp. *lacmonicus*	•	•	•	•		•	•	•		
B. riparius subsp. *macedonicus*	•									
Bupleurum flavicans	•	•								
Campanula formanekiana	•	•								
C. sparsa subsp. *sphaerothrix*	•			•						
C. spatulata subsp. *spatulata*	•	•	•	•	•	•	•	•	•	
Carlina frigida	•		•		•		•	•		
Carum graecum	•	•	•	•	•		•	•		
C. rupestre	•	•	•		•	•		•		
Centaurea macedonica subsp. *macedonica*	•									
C. napulifera subsp. *velenovskyi*	•	•	•							
C. pindicola	•	•		•		•				
Cephalaria umbrosioides	•			•				•		
C. flava	•			•						
Cerastium banaticum subsp. *speciosum*	•	•	•	•	•	•	•		•	
Cirsium appendiculatum	•	•	•	•	•		•			
C. candelabrum	•									
Colchicum doerfleri	•	•		•		•				
Crocus chrysanthus	•	•	•	•						
C. cvijicii	•	•	•			•				
C. sieberi subsp. *sublimis*	•	•	•	•		•	•	•		•
Dactylorhiza baumanniana	•	•	•				•			
D. kalopissii	•	•		•						
Dianths viscidus	•	•	•	•	•	•	•	•		•
D. haematocalyx subsp. *haematocalyx*	•	•				•				
D. petraeus subsp. *minutiflorus*	•	•	•		•	•	•	•		
D. pinifolius var. *serbicus*	•	•	•	•						
D. stenopetalus	•	•	•		•	•	•	•		
Digitalis viridiflora	•	•	•	•						
Draba lasiocarpa subsp. *lasiocarpa*	•	•	•	•	•	•	•	•	•	•
Erysimum comatum	•			•						
E. microstylum	•	•	•		•		•			•
Festuca macedonica	•	•	•	•	•	•	•			
Galium breviramosum	•	•	•	•						
G. degenii	•	•	•		•	•	•			
G. hellenicum	•	•	•		•	•	•			
G. oreophilum	•	•			•		•			
G. rigidifolium	•			•						
Geocaryum pindicolum	•		•		•		•			
Haplophyllum coronatum	•	•	•	•						
Helleborus odorus	•	•	•	•	•	•	•	•	•	•

BALKAN ENDEMICS	NC		NP	NE	SP	EC	StE	Pel	AE	IO
	Ve	Other mountains								
Herniaria parnassica subsp. *parnassica*	*	*	*		*		*	*		
Hieracium cymosum subsp. *heldreichianum*	*	*	*	*	*		*	*		
H. pannosum	*	*	*	*	*	*	*	*	*	
H. parnassi	*	*	*		*		*	*		
Hypericum apollinis	*	*	*		*		*			
Hypericum rumeliacum	*	*		*						
Inula verbascifolia subsp. *aschersoniana*	*	*		*						
Knautia ambigua	*	*		*	*					
K. midzorensis	*	*								
Lamium bifidum subsp. *balcanicum*	*	*	*	*	*		*		*	
Lathyrus alpestris	*			*						
Lilium carniolicum subsp. *albanicum*	*	*	*	*	*					
L. chalcedonicum	*	*	*		*	*	*	*		*
Linaria peloponnesiaca var. *parnassica*	*	*	*	*		*	*	*		*
Linum elegans	*	*		*				*		
L. pubescens	*							*		
Minuartia glomerata subsp.*macedonica*	*	*	*	*						
Myosotis alpestris subsp. *suaveolens*	*	*	*		*		*	*		
Onobrychis alba subsp. *calcarea*	*	*		*						
O. montana subsp. *scardica*	*		*	*	*		*	*		
Onosma montana	*									
Paronychia macedonica subsp. *macedonica*	*	*			*			*		
Peucedanum oligophyllum subsp. *oligophyllum*	*	*	*				*			
Phlomis samia	*			*						
Plantago media subsp. *pindica*	*	*	*		*					
Poa thessala	*	*	*	*	*	*	*	*		
Ramonda nathaliae	*	*								
Ranunculus psilostachys	*	*	*	*	*		*	*	*	
Saxifraga porophylla subsp. *grisebachii*	*	*								
S. scardica	*	*				*	*	*		
Scabiosa tenuis	*									
Scutellaria rubicunda subsp. *adenotricha*	*		*		*		*			*
Sempervirum marmoreum	*	*	*	*	*		*	*		
Seslaria latifolia	*	*								
S. rigida	*									
S. albicans subsp. *angustifolia*	*									
Sideritis raeseri	*		*		*	*	*			
S. scardica	*	*		*		*			*	
Silene fabarioides	*	*	*		*		*			
S. radicosa subsp. *radicosa*	*	*	*	*	*	*	*	*		
Stachys iva	*	*								
S. plumose	*	*	*	*	*				*	
Stipa thessala	*	*								
Taraxacum gracilens	*						*	*		
Teucrium helianthemoides	*	*		*		*	*			
Thlaspi kovatsii	*	*		*						
T. pindicum	*	*	*		*		*			
Thymus praecox subsp. *zygiformis*	*		*		*					
Trifolium pignantii	*	*	*	*	*	*	*	*		
Trisetum flavescens subsp. *tenue*	*		*		*		*	*		
Tulipa uromoffi	*									
Valantia aprica	*		*		*		*	*		
Verbascum eriophorum	*			*						
V. undulatum	*									
Vincetoxicum hirundinaria subsp. *nivale*	*	*	*	*			*	*		
Viola beckiana	*									
V. eximia	*	*			*					
V. orphanidis	*	*	*		*		*			
V. tricolor subsp. *macedonica*	*	*	*	*	*	*			*	
TOTAL	**119**	**89**	**65**	**60**	**56**	**30**	**54**	**41**	**12**	**8**

Table 5. Balkan-Anatolian taxa occurring on Mt. Vermion and their geographical distribution on other mountains of NC Greece and wider geographical regions.

Balkan-anatolian taxa	NC		NE	NP	SP	EC	StE	Pel	AE	IO	Cr
	Ve	Other mountains									
Acer tataricum	•										
Anthemis tinctoria subsp. *parnassica*	•	•	•	•		•	•	•			
Astragalus angustifolius subsp. *pungens*	•		•								
Corydalis integra	•		•						•		
Crocus olivieri	•		•					•	•		
Cynoglottis barrelieri subsp. *serpentinicola*	•	•		•			•				
Dianthus cruentus	•	•	•	•	•		•	•			
Dianthus giganteus	•	•	•		•						
Euphorbia oblongata	•		•								•
Genista carinalis	•	•	•		•	•					
Genista lydia	•		•						•		
Geranium macrostylum	•	•		•	•		•		•		
Geum coccineum	•	•		•							
Hesperis theophrasti	•										
Iris attica	•	•	•			•	•	•			
Lamium garganicum subsp. *laevigatum*	•	•	•	•	•	•	•		•		
Matricaria trichophylla	•		•		•						
Minuartia globulosa	•						•				•
Ornithogalum oligophyllum	•	•		•	•	•					
Pinguicula balcanica subsp. *balcanica*	•	•		•			•				
Podocytisus caramanicus	•						•				
Ranunculus rumelicus	•	•	•						•		•
Rorippa thracica	•	•	•								
Satureja cristata	•	•	•								
Sedum grisebachii subsp. *flexuosum*	•										
Sesleria robusta	•	•	•	•							
Silene bupleuroides subsp. *staticifolia*	•		•								
Stachys germanica subsp. *heldreichii*	•	•	•	•	•		•	•			
Stachys officinalis subsp. *haussknechtii*	•			•							
Tephroseris integrifolia subsp. *aucheri*	•	•	•	•	•		•	•			
Thlaspi ochroleucum	•	•	•	•			•		•		
Thymus longicaulis subsp. *chaubardii*	•	•	•	•		•		•	•		
Thymus sibthorpii	•	•	•								
Trifolium hybridum subsp. *anatolicum*	•			•	•		•				
TOTAL	**34**	**20**	**22**	**15**	**10**	**7**	**13**	**7**	**8**	**0**	**3**

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