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**The bumblebee fauna of Greece:  
An annotated species list including new records for Greece  
(Hymenoptera: Apidae, Bombini)**

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**A b s t r a c t :** Greek bumblebee fauna records (*Bombus* LATREILLE 1802) are known from published studies on Greek insects and from publications concerning bumblebees or pollinators in general. From the published information concerning Greek bumblebees 23 species are presented with their valid names and with comments. Wherever noted, the locality region of each record is also mentioned. Original data are presented from the identification of specimens collected from Greece (with greater sampling effort in Flórina - Northwest Macedonia). This material confirmed the presence of 17 out of the 23 species recorded in the literature, provided various new locality records and yielded five species new to the Greek entomofauna: *Bombus (Psithyrus) bohemicus* SEIDL 1837, *B. (Ps.) campestris* (PANZER 1801), *B. (Ps.) maxillosus* KLUG 1817, *B. (Thoracobombus) deuteronymus* SCHULZ 1906, *B. (Th.) sylvorum* (LINNAEUS 1761). An updated species list is provided for the 28 bumblebee species known currently for Greece.

**K e y w o r d s :** Hymenoptera, Apidae, Bombini, *Bombus*, Palaearctic region, Balkan, Greece, Flórina, distribution, ecology, taxonomy, new records, species list.

### Introduction

Bumblebees (*Bombus* LATREILLE 1802) are common insects in much of Greece. Studies on the Greek bumblebee fauna must be considered incomplete since it is not yet certain which valid species are encountered. Some species are known from regional studies on Greek insects that include Hymenoptera (ATANASSOV 1965), Apidae (ALFKEN 1927, MAVROMOUSTAKIS 1959, PAGANETTI-HUMMLER 1912, STRAND 1915, WARNCKE 1988) or pollinators in general (PETANIDOU 1991, THRASYVOULOU & TSIRAKOGLU 1998, VOKOU et al. 1990). The majority of species are known from publications on bumblebees that consider parts of Greece (PITTIONI 1938 & 1939, RASMONT 1983 & 1984, REINIG 1939 & 1966). PITTIONI (1938, 1939 & 1941) may be considered one of the first authors to provide information on seven species distributed in Greece including description of variation and keys for identification. REINIG (1939 & 1966) listed 15 species on Mt. Olympos and eight in northern Greece. More recent publications either confirm (RASMONT 1983, WARNCKE 1988, ANAGNOSTOPOULOS 1999) or add new species (RASMONT 1984) to the previous. In a recent study (ANAGNOSTOPOULOS 1999), 22 species were listed for Greece with new locality records, mostly from the northern mountain

ranges. There has been no species list published since the first list in Greek (ANAGNOSTOPOULOS 1999) for data published before 1995 (revising names to 1995 nomenclature standards). To continue this work and to provide a better understanding of the Greek bumblebee fauna, information from new material is presented here.

### Material and Methods

To address the primary question of the composition of the Greek bumblebee fauna, both a literature search (based on ANAGNOSTOPOULOS 1999) and a field collecting approach was used. Many additional manuscripts have now been studied, with emphasis on those referring to the Balkan and Greek entomofauna and in all, 31 publications have been found to contain information on this topic. Five of the 31 publications mentioned state the presence of bumblebees, without indicating species name; the four as pollinators to specific plants in Greece (BLIONIS & VOKOU 2001, GUMBERT & KUNZE 2001, LYDAKI & VLAHOS 2000, TEPPNER 1995) and one as a disturbance to honey bee colonies (ANAGNOSTOPOULOS 1997). Although this type of work may never be considered complete, an effort has been made to include all related publications. Original data are from the bumblebees collected during field studies carried out by myself (1995-1996) from many parts of the country but especially from the region of Flórina (North-West Macedonia). The identification of the bumblebee specimens collected confirmed the presence of 17 of the species published for Greece. From this original material, five bumblebee species were recorded for the first time and are new to the Greek entomofauna: *Bombus (Psithyrus) bohemicus* SEIDL 1837, *B. (Ps.) campestris* (PANZER 1801), *B. (Ps.) maxillosus* KLUG 1817, *B. (Thoracobombus) deuteronymus* SCHULZ 1906, *B. (Th.) sylvarum* (LINNAEUS 1761). Representatives of each species recorded during this study have been placed as a reference collection at the Laboratory of Apiculture, School of Agriculture, T.E.I. of West Macedonia at Flórina, Greece. The majority of the material examined has been stored as dried and pinned specimens in the author's private collection.

The following annotated species list combines the information from publications and from the field study findings for the 28 bumblebee species known from Greece at present. The species names listed used originally by the authors are given under the current valid name. The locality (modern Greek name) of each record is also mentioned after the author that provides the information. In a few instances there is confusion concerning to which species the bees belonged. Since material from the publications could not be studied, some cases of synonymy or misidentification remain unclear. In general, cross-referencing of publications with the material collected was used to clarify most cases. Taxonomic specialists were also consulted to resolve doubts regarding the synonyms and currently valid nomenclature (see acknowledgments). In this paper a single genus for all bumblebees is recognised, *Bombus*, treating *Psithyrus* as a single subgenus. To maintain a degree of uniformity the order in which the subgenera are arranged and their two letter abbreviations used, follows the subgeneric classification as modified by WILLIAMS (1998). To aid the finding of species names, species within subgenera are arranged alphabetically and not in an order that would represent their phylogenetic relationships, since depending on the estimate of relationship chosen different sequencing of the species arises. Some of the species presented in this paper are likely to be conspecific and

are noted with a question mark (?) before the species name. At this point of the study of Greek bumblebees, for simplicity in this paper, all such taxa are listed as separate species with comments on their status. Published records with subspecific names, such as subspecies and even taxa of lower nomenclatural ranks ("varieties", "morphs" or "forms"), are not included. In order to aid scholars interested in subspecific names there are references to the publications that provide such names in their work. It is my opinion that subspecific taxa for the Greek bumblebee fauna should be presented in future studies that will be able to provide detailed information on each taxon as our knowledge for this region increases. This task may be considered as a stimulus for further studies on taxa and on less studied areas:

From the number of specimens examined, the bumblebee species inventory of Greece may not yet be considered complete. It is very likely that with greater sampling effort several species known from the other Balkan countries will be discovered within Greece. These may include: *Bombus* (*Mucidobombus*) *mucidus* GERSTAECKER, *B. (Eversmannibombus) persicus* RADOSZKOWSKI, *B. (Psithyrus) barbutellus* (KIRBY), *B. (Ps.) quadricolor* (LEPELETIER), *B. (Ps.) rupestris* (FABRICIUS), *B. (Ps.) sylvestris* (LEPELETIER), *B. (Thoracobombus) mlokosievitzii* RADOSZKOWSKI, *B. (Megabombus) gerstaeckeri* MORAWITZ, *B. (Mg.) ruderatus* (FABRICIUS), *B. (Rhodobombus) armeniacus* RADOSZKOWSKI, *B. (Subterraneobombus) fragrans* (PALLAS), *B. (Pyrobombus) hypnorum* (LINNAEUS), *B. (Pr.) jonellus* (KIRBY), *B. (Bombus) magnus* VOGT, *B. (Melanobombus) incertus* MORAWITZ, *B. (Ml.) sichelii* RADOSZKOWSKI (DRENOWSKI 1934, FRIESE 1923, ÖZBEK 2002, PITTIONI 1938, RASMONT 1983 & 1984, TKALCÜ 1969). In addition, most Greek species have been collected on very few occasions, so that the current knowledge of their distribution is far from complete. Future field studies particularly in the north mainland mountain ranges and in the Aegean islands such as Lésbos, Hios, Sámos, Kos and Rhódos, as well as studies of specimens in museum collections are sure to reveal most valuable information on the Greek bumblebee fauna.

## The Greek bumblebee fauna

### Genus *Bombus* LATREILLE 1802

Subgenus *Psithyrus* LEPELETIER 1832

### *Bombus vestalis* (GEOFFROY 1785)

Literature records: (ANAGNOSTOPOULOS 1999: Séres, Flórina, Flórina-Mt.Vitsi); *Psithyrus vestalis* FOURCR. (STRAND 1915: Kriti-Haniá).

Collected material examined: Greece, Flórina Prefecture: 4♂, Nimféo, mountain slope, 40°38'45N, 21°29'29E, 1350m, on *Origanum* spp., 4.VIII.1996; 1♀, Ano Klinés, uncultivated field, 40°50'37N, 21°22'25E, 650m, on *Vicia* spp., 18.VI.1995.

**Subgenus *Laesobombus* KRÜGER 1920*****Bombus laesus* MORAWITZ 1875**

**Literature records:** (ANAGNOSTOPOULOS 1999: Flórina); *Bombus (Agrobombus) laesus* MOR. (PITTIONI 1938: Thessaloniki); (REINIG 1939) subspecific name noted.

**Collected material examined:** Greece, Flórina Prefecture: 1♀, Niki, farm land, beside agricultural field road, 40°53'49N, 21°24'36E, 600m, on *Vicia* spp., 9.VI.1996; 1♂, Mesókabos, uncultivated field, 40°54'04N, 21°30'43E, 600m, on *Echium* spp., 5.VII.1996; 1♂, Néos Káfkasos, farm field, 40°54'30N, 21°28'29E, 550m, on *Centaurea* spp., 6.VII.1995.

**Subgenus *Thoracobombus* DALLA TORRE 1880*****Bombus humilis* ILLIGER 1806**

**Literature records:** (ANAGNOSTOPOULOS 1999: Flórina, Flórina-Mt.Vitsi, Ebritania, Séres); (REINIG 1966: Mt. Olympos) subspecific name noted; *Bombus (Agrobombus) helferanus* SEIDL. (PITTIONI 1938) subspecific name noted; *Bombus variabilis* SCHMIEDK. (STRAND 1915: Kriti-Haniá); *Bombus variabilis* (REINIG 1939); (RASMONT 1983) subspecific name noted.

**Comments:** Usage of the traditional *Bombus humilis* is now justified by the Opinion 1828 of the INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE (I.C.Z.N.) (1996) after the proposal in case 2638 made to I.C.Z.N. by LØKEN et al. (1994).

**Collected material examined:** Greece, Flórina Prefecture: 1♂, Mt. Vigla, beech forest, 40°46'26N, 21°15'58E, 1600m, on *Epilobium* spp., 13.VIII.1995; 1♀, S. Ioannidis, mountain slope, 40°46'43N, 21°20'39E, 750m, on *Vicia cracca*, 9.VI.1996; 1♀, same data, 10.VI.1996; 1♂, Antartikó, mountain slope, 40°45'56N, 21°12'40E, 1250m, on *Vicia* spp., 1.VII.1995; 1♂, Flórina, uncultivated field, 40°46'17N, 21°25'08E, 650m, on *Carduus* spp., 6.VIII.1995; 1♀, same data but on *Vicia* spp., 7.VI.1996; 1♂, same data but on *Echium* spp., 30.VI.1996.

***Bombus muscorum* (LINNAEUS 1758)**

**Literature record:** (ALFKEN 1927: Kriti-Haniá) subspecific name noted; *Bombus (Agrobombus) muscorum* L. (ATANASSOV 1965: Thásson).

**Comments:** Usage of the traditional *Bombus muscorum* is now justified by the Opinion 1828 of the I.C.Z.N. (1996) after the proposal in case 2638 made to I.C.Z.N. by LØKEN et al. (1994).

**Collected material examined:** Greece, Flórina Prefecture: 1♂, Néos Káfkasos, farm field, 40°54'30N, 21°28'29E, 550m, on *Carduus* spp., 5.IX.1995; 1♂, Mesókabos, uncultivated field, 40°54'04N, 21°30'43E, 600m, on *Echium* spp., 5.VII.1996; 2♂♂, same data, 9.VII.1996.

***Bombus pascuorum* (SCOPOLI 1763)**

**Literature records:** (ANAGNOSTOPOULOS 1996); (ANAGNOSTOPOULOS 1999: Flórina, Flórina-Mt.Vitsi, Ebritania, Séres); *Bombus (Agrobombus) agrorum* F. (PITTIONI 1941: North Greece) subspecific names noted; *Bombus agrorum* (REINIG 1939: Mt. Olympos) subspecific name noted; *Bombus agrorum* F. (REINIG 1966: Mt. Olympos); *Bombus (Agrobombus) agrorum* FABR. (ATANASSOV 1965: Thásson); (RASMONT 1983) subspecific name noted.

**Comments:** The use of *Bombus pascuorum* follows recent checklists (RASMONT 1983, REINIG 1981, SCHWARZ et al. 1996, WARNCKE 1986, WILLIAMS 1998).

Collected material examined: Greece, Ebrítania Prefecture: 1♀, Klavsi, mountain riverbank, 38°52'N, 21°45'E, 700m, on *Anchusa* spp., 18.VI.1996. Greece, Flórina Prefecture: 1♂, Mt. Vigla, beech forest, 40°46'26N, 21°15'58E, 1600m, 25.VIII.1995; 2♂♂, S. Ioannidis, mountain slope, 40°46'43N, 21°20'39E, 750m, on *Vicia cracca*, 9.VI.1996; 1♂, Nimféo, mountain slope, 40°38'45N, 21°29'29E, 1350m, on *Origanum* spp., 3.VIII.1996; 2♂♂, same data, 4.VIII.1996; 1♂, Mt. Vigla, beech forest, 40°46'26N, 21°15'58E, 1600m, on *Epilobium* spp., 1.VI.1996; 1♂, Flórina, field, 40°46'17N, 21°25'08E, 650m, on *Vicia* spp., 7.VI.1996.

### ***Bombus ruderarius* (MÜLLER 1776)**

Literature record: (REINIG 1966: Mt. Olympos).

### ***Bombus zonatus* SMITH 1854**

Literature records: (ANAGNOSTOPOULOS 1999: Flórina); (REINIG 1966: Mt. Olympos); *Bombus (Agrobombus) zonatus* SM. (PITTIONI 1938: Epirus, Olympia, Corfu, Argos, Attica) subspecific names noted; *Bombus zonatus* SCHMITH, incorrect spelling of SMITH (PAGANETTI-HUMMLER 1912: Corfu); (RASMONT 1983) subspecific name noted.

Collected material examined: Greece, Flórina Prefecture: 1♂, Ano Klinés, uncultivated field, 40°50'N, 21°22'E, 600m, on *Echium* spp., 25.VI.1996; 1♂, Mesókabos, uncultivated field, 40°54'04N, 21°30'43E, 600m, on *Echium* spp., 5.VII.1996; 1♂, same data, 9.VII.1996; 1♂, same data but on *Carduus* spp., 9.VII.1996; 1♂, Marina, uncultivated field, 40°51'N, 21°29'E, 600m, on *Centaurea* spp., 9.VII.1996.

### **Subgenus *Megabombus* DALLA TORRE 1880**

### ***Bombus argillaceus* (SCOPOLI 1763)**

Literature records: (ALFKEN 1927: Kriti-Haniá); (ANAGNOSTOPOULOS 1996); (ANAGNOSTOPOULOS 1999: Flórina, Flórina-Mt.Vitsi, Ebrítania); *Bombus ruderatus* (REINIG 1939: North Greece, Kriti) subspecific name noted; (REINIG 1966: Mt. Olympos); *Bombus (Hortobombus) argillaceus* SCOP. (PITTIONI 1938: Mainland Greece, Kriti); (STRAND 1915: Kriti-Haniá, Kriti-Iráklio) subspecific name noted; *Bombus (Hortobombus) argillaceus* SCOP. (ATANASSOV 1965: Thássos); *Megabombus argillaceus* (SCOPOLI) (PETANIDOU 1991 & 1993: Attica-Dafni).

Comments: The use of *Bombus argillaceus* follows recent checklists (RASMONT 1983, REINIG 1981, SCHWARZ et al. 1996, WARNCKE 1986, WILLIAMS 1998).

Collected material examined: Greece, Flórina Prefecture: 1♂, Mesókabos, uncultivated field, 40°54'04N, 21°30'43E, 600m, on *Echium* spp., 5.VI.1996; 1♂, Mt. Vitsi, mountain slope, 40°39'44N, 21°34'57E, 1800m, on *Crocus* spp., 18.V.1996; 1♀, Flórina, field, 40°46'17N, 21°25'08E, 650m, on *Vicia* spp., 16.V.1996; 1♂, same data but on *Echium* spp., 13.VII.1995; 1♂, Ano Klinés, uncultivated field, 40°50'37N, 21°22'25E, 650m, on *Vicia cracca*, 18.VI.1995.

### ***Bombus hortorum* (LINNAEUS 1761)**

Literature records: (ANAGNOSTOPOULOS 1996); (ANAGNOSTOPOULOS 1999: Flórina, Flórina-Mt.Vitsi, Séres); (PAGANETTI-HUMMLER 1912: Corfu); (REINIG 1966: Mt. Olympos); (STRAND 1915: Kriti) subspecific name noted.

Collected material examined: Greece, Flórina Prefecture: 1♂, S. Ioannidis, mountain slope, 40°46'43N, 21°20'39E, 750m, on *Carduus* spp., 25.VIII.1995; 4♀♀, Mt. Vitsi, mountain slope, 40°39'44N, 21°34'57E, 1800m, on *Crocus* spp., 18.V.1996; 2♂♂, Antartikó, mountain river bank, 40°45'56N, 21°12'40E, 1250m, on *Vicia* spp., 1.VII.1995.

**Subgenus *Rhodobombus* DALLA TORRE 1880**

***Bombus mesomelas* (GERSTAECKER 1869)**

L i t e r a t u r e   r e c o r d s : (ANAGNOSTOPOULOS 1999: Flórina, Flórina-Mt.Vitsi); *Bombus elegans* SEIDL (REINIG 1966: Mt. Olympus).

C o m m e n t s : The name *Bombus elegans* has been applied to several different species (TKALCŪ 1969). In this case *Bombus elegans* may actually be a misidentification of *Bombus mesomelas* since according to TKALCŪ (1969) a specimen of *Bombus mesomelas* may be substituted as the type for *Bombus elegans* that Seidl originally described after this original type was lost. Thus REINIG (1966) is probably referring to the species commonly known now as *Bombus mesomelas* (DRENOWSKI 1934, REINIG 1981). Since only *Bombus mesomelas* has been recorded in Greece from recent years (ANAGNOSTOPOULOS 1999) and not having examined Reinig's material, until more evidence to the contrary is available I shall treat Reinig's *Bombus elegans* as a misidentification of *Bombus mesomelas*.

C o l l e c t e d   m a t e r i a l   e x a m i n e d : **Greece, Flórina Prefecture:** 1♀, Mt. Vitsi, mountain slope, 40°39'44N, 21°34'57E, 1800m, on *Crocus* spp., 18.V.1996; 1♂, Néos Káfkasos, farm field, 40°54'30N, 21°28'29E, 550m, on *Centaurea* spp., 6.VII.1995; 1♂, Ano Klinés, uncultivated field, 40°50'N, 21°22'E, 600m, on *Echium* spp., 21.VI.1996; 1♂, Mesókabos, uncultivated field, 40°54'04N, 21°30'43E, 600m, on *Echium* spp., 5.VII.1996; 2♂♂, same data, 9.VII.1996; 1♂, Marina, uncultivated field, 40°51'N, 21°29'E, 600m, on *Centaurea* spp., 9.VII.1996.

***Bombus pomorum* (PANZER 1805)**

L i t e r a t u r e   r e c o r d : (REINIG 1966: North Greece).

**Subgenus *Kallobombus* DALLA TORRE 1880**

***Bombus soroensis* (FABRICIUS 1777)**

L i t e r a t u r e   r e c o r d s : (ANAGNOSTOPOULOS 1999: Flórina, Flórina-Mt.Vitsi); (REINIG 1939: North Greece) subspecific name noted; (REINIG 1966: Mt. Olympus); *Pyrobombus soroensis* (GERST.) (VOKOU et al. 1990: Mt. Olympus) subspecific name noted.

C o l l e c t e d   m a t e r i a l   e x a m i n e d : **Greece, Flórina Prefecture:** 1♂, Nimféo, mountain slope, 40°38'45N, 21°29'29E, 1350m, on *Origanum* spp., 4.VIII.1996; 1♂, same data but on *Carduus* spp., 31.VIII.1996; 1♂, Mt. Vigla, beech forest, 40°46'26N, 21°15'58E, 1600m, on *Epilobium* spp., 25.VIII.1995; 1♂, same data, 13.VIII.1995; 1♂, same data; 2♂♂, Nimféo, mountain slope, 40°38'45N, 21°29'29E, 1350m, on *Origanum* spp., 4.VIII.1996.

**Subgenus *Subterraneobombus* VOGT 1911**

***Bombus subterraneus* (LINNAEUS 1758)**

L i t e r a t u r e   r e c o r d : (REINIG 1966: Mt. Olympus).

**Subgenus *Alpigenobombus* SKORIKOV 1914**

***Bombus wurflenii* RADOSZKOWSKI 1859**

L i t e r a t u r e   r e c o r d s : (ANAGNOSTOPOULOS 1999: Séres); *Bombus mastrucatus* Gerst. (REINIG 1966: North Greece).

C o m m e n t s : The use of *Bombus wurflenii* follows recent checklists (REINIG 1981, WILLIAMS 1998).

C o l l e c t e d   m a t e r i a l   e x a m i n e d : Greece, Séres Prefecture: 1♂, Gónimo, mountain forest, 41°14'N, 23°14'E, 1500m, on *Carduus* spp., 4.VIII.1996.

**Subgenus *Pyrobombus* DALLA TORRE 1880**

***Bombus haematurus* KRIECHBAUMER 1870**

L i t e r a t u r e   r e c o r d : *Bombus (Pratobombus) haematurus* KRIECHB. (ATANASSOV 1965: Thássos).

C o l l e c t e d   m a t e r i a l   e x a m i n e d : Greece, Flórina Prefecture: 1♂, Flórina, foraging in township, 40°46'N, 21°22'E, 650m, 13.VI.1996; 1♂, same data, 19.VI.1996; 1♀, Flórina, 40°46'50N, 21°22'52E, 700m, on *Prunus amygdalus*, 3.IV.1995.

**(?)*Bombus monticola* SMITH 1849**

L i t e r a t u r e   r e c o r d s : *Bombus lapponicus* (FABRICIUS 1793) (REINIG 1966: Mt. Olympos); *Bombus lapponicus* (FABRICIUS 1793) (WARNCKE 1988: Mt. Olympos).

C o m m e n t s : Following the recognition of two species within the taxon of *Bombus lapponicus* by SVENSSON (1979), who also cites REINIG (1966), the referenced bees are part of the central and south European species *Bombus monticola* (SVENSSON 1979). This is accepted by REINIG (1981). KOULIANOS (1999) from her study on mitochondrial cytochrome oxidase I genes suggests *Bombus lapponicus* and *Bombus monticola* are likely to be conspecific. Until further evidence is available, the referenced bees of *Bombus lapponicus* will be treated as a separate species *Bombus monticola*.

***Bombus pratorum* (LINNAEUS 1761)**

L i t e r a t u r e   r e c o r d s : (ANAGNOSTOPOULOS 1996); (ANAGNOSTOPOULOS 1999: Séres); (REINIG 1966: Mt. Olympos); *Pyrobombus pratorum* (L.) (VOKOU et al. 1990: Mt. Olympos).

C o l l e c t e d   m a t e r i a l   e x a m i n e d : Greece, Flórina Prefecture: 1♂, Mt. Vigla, beech forest, 40°46'26N, 21°15'58E, 1600m, on *Verbrascum* spp., 1.VI.1996; 1♂, same data but on *Epilobium* spp.; 4♂♂, same data, 13.VIII.1995; 2♂♂, same data, 25.VIII.1995; 1♀, S. Ioannidis, mountain slope, 40°46'43N, 21°20'39E, 750m, on *Prunus amygdalus*, 3.IV.1995; 2♂♂, Mt. Vigla, beech forest, 40°46'26N, 21°15'58E, 1600m, on *Epilobium* spp., 13.VIII.1995.

***Bombus pyrenaeus* PÉREZ 1880**

L i t e r a t u r e   r e c o r d : (REINIG 1966: North Greece).

**Subgenus *Bombus* LATREILLE 1802****(?)*Bombus cryptarum* (FABRICIUS 1775)**

**L i t e r a t u r e r e c o r d :** (RASMONT 1984: Flórina-Vigla) subspecific name noted.

**C o m m e n t s :** Recently *Bombus cryptarum* has been treated as conspecific with *Bombus lucorum* by POOLE (1996), which has been followed by authors, allowing *Bombus lucorum* in the broader sense to include a complex of similar taxa (WILLIAMS 1998). Probably these taxa require more critical work to clarify this complex issue. Here however, since Rasmont is an author that is considered to well recognise the specific status of these taxa and in addition since the material of *Bombus cryptarum* referenced here has been studied by RASMONT (1984) I will not treat *Bombus cryptarum* as conspecific with *Bombus lucorum* in the broader sense, but as a separate species until further evidence to the contrary is available. Identification of the collected material was based on treating *Bombus lucorum* s. l. thus *Bombus cryptarum* specimens that may have been collected have not been identified as such (see the comments on *Bombus lucorum*).

***Bombus lucorum* (LINNAEUS 1761)**

**L i t e r a t u r e r e c o r d s :** (ANAGNOSTOPOULOS 1996); (ANAGNOSTOPOULOS 1999: Flórina, Flórina-Mt.Vitsi); (RASMONT 1983) subspecific name noted; (THRASYVOULOU & TSIRAKOGLU 1998: Thessaloniki) subspecific name noted; (VOKOU et al. 1990: Mt. Olympus); (REINIG 1966: Mt. Olympus).

**C o m m e n t s :** Usage of the traditional *Bombus lucorum* is now justified by the Opinion 1828 of the INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE (I.C.Z.N.) (1996) after the proposal in case 2638 made to I.C.Z.N. by LØKEN et al. (1994). The interpretation of *Bombus lucorum* in the broader sense has allowed *Bombus lucorum* s. l. to include a complex of similar taxa, which have conflicting patterns of variation among some of their characters (WILLIAMS 1998). For the collected specimens of this taxon, *Bombus lucorum* s. l. is followed. Thus the collected material presented in this study may include bees of *Bombus lucorum* in the strict sense (e.g. queens) as well as specimens belonging in other nominal taxa of this group of bumblebees.

**C o l l e c t e d m a t e r i a l e x a m i n e d :** Greece, Flórina Prefecture: 2♂♂, Nimféo, mountain slope, 40°38'45N, 21°29'29E, 1350m, on *Origanum* spp., 3.VIII.1996; 3♂♂, same data, 4.VIII.1996; 1♀, S. Ioannidis, 40°46'43N, 21°20'39E, 750m, on *Prunus amygdalus*, 19.IV.1995; 1♀, Mt. Vitsi, mountain slope, 40°39'44N, 21°34'57E, 1800m, on *Crocus* spp., 18.V.1996; 1♂, Mt. Vigla, beech forest, 40°46'26N, 21°15'58E, 1600m, on *Epilobium* spp., 13.VIII.1995; 1♂, S. Ioannidis, 40°46'43N, 21°20'39E, 750m, on *Rubus* spp., 20.VI.1995.

***Bombus terrestris* (LINNAEUS 1758)**

**L i t e r a t u r e r e c o r d s :** *Bombus (Bombus) lucorum* L. (PITTIONI 1938: Icaria, Rhódos, Kárpáthos) subspecific name noted; (ALFKEN 1927: Kriti-Haniá, Attica); (ANAGNOSTOPOULOS 1996); (ANAGNOSTOPOULOS 1999: Flórina, Flórina-Préspa, Ebritania, Séres, Kriti-Iráklio); (ATANASSOV 1965: Thássos); (RASMONT 1983: Kriti) subspecific name noted; (RASMONT et al. 2005); (ESTOUP et al. 1996: Sámos, Chalkidiki-Néa Moudaniá) subspecific name noted; (VIARD et al. 1998: Sámos); (NUTTMAN & WILLMER 2003: Lésbos); (CHITTKA et al. 2004: Rhódos); (PAGANETTI-HUMMLER 1912: Corfu); (PEAT et al. 2005) commercial colonies; (YENINAR et al. 2000) subspecific name noted; (PETANIDOU 1991 & 1993: Attica-Dafni); (PITTIONI 1938: Mainland Greece, Corfu, Skópelos); (REINIG 1966: Mt. Olympus); (STRAND 1915: Kriti-Haniá, Kriti-Iráklio); (THRASYVOULOU & TSIRAKOGLU 1998: Thessaloniki); (ZAVATTARI 1913 cited in MAVROMOUSTAKIS 1959: Rhódos).



**Comments:** Usage of the traditional *Bombus terrestris* is now justified by the Opinion 1828 of the INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE (I.C.Z.N.) (1996) after the proposal in case 2638 made to I.C.Z.N. by LØKEN et al. (1994). PITTIONI (1938) states difficulties in distinguishing between the Aegean populations of *Bombus lucorum* and *Bombus terrestris*, especially the males. Since he placed his material under the morph *dalmatinus*, presently known as a subspecies of *Bombus terrestris* I will not treat Pittioni's bees here as *Bombus lucorum* but as *Bombus terrestris*. Greek origin colonies of *Bombus terrestris dalmatinus* are reared commercially for use in greenhouse pollination throughout Europe (YENINAR et al. 2000, CHITTKA et al. 2004, PEAT et al. 2005).

**Collected material examined:** Greece, Flórina Prefecture: 3♂♂, Flórina, foraging in township, 40°46'N, 21°22'E, 650m, on *Tagetes* spp., 10.X.1995; 1♂, Nimféo, mountain slope, 40°38'N, 21°29'E, 1300m, on *Carduus* spp., 12.X.1996; 1♀, S. Ioannidis, mountain slope, 40°46'43N, 21°20'39E, 750m, on *Vicia cracca*, 11.VI.1995; 2♀♀, same data but on *Prunus amygdalus*, 3.IV.1995; 1♀, same data, 26.III.1995; 1♀, Flórina, foraging in township, 40°46'N, 21°22'E, 650m, on *Prunus cerasus*, 13.IV.1995; 1♀, same data, 18.IV.1995; 1♀, Mt. Vigla, beech forest, 40°46'26N, 21°15'58E, 1600m, on *Epilobium* spp., 1.VI.1996; 1♂, Flórina, farmland field, 40°46'17N, 21°25'08E, 650m, on *Echium* spp., 13.VII.1996; 1♂, same data but on *Vicia* spp., 7.VI.1996; 1♂, Pérasma, farm field, 40°45'40N, 21°27'33E, 600m, on *Vicia cracca*, 24.VI.1995; 1♂, S. Ioannidis, mountain slope, 40°46'43N, 21°20'39E, 750m, on *Vicia cracca*, 11.VI.1995; 1♂, Agios Germanós, mountain slope, 40°50'34N, 21°09'33E, 1350m, on *Carduus* spp., 11.VI.1995; 1♂, Psarádes, mountain slope, 40°49'52N, 21°01'29E, 900m, 14.VIII.1995.

### Subgenus *Melanobombus* DALLA TORRE 1880

#### *Bombus lapidarius* (LINNAEUS 1758)

**Literature records:** (ANAGNOSTOPOULOS 1996); (ANAGNOSTOPOULOS 1999: Flórina, Flórina-Mt. Vitsi, Flórina-Préspa, Séres); (REINIG 1939: North Greece) subspecific name noted; (REINIG 1966: Mt. Olympos).

**Collected material examined:** Greece, Flórina Prefecture: 1♂, S. Ioannidis, mountain slope, 40°46'43N, 21°20'39E, 750m, on *Carduus* spp., 12.X.1996; 2♂♂, Nimféo, mountain slope, 40°38'45N, 21°29'29E, 1350m, on *Carduus* spp., 4.VIII.1996; 2♂♂, same data, 31.VIII.1996; 1♂, same data, 40°38'N, 21°29'E, 1300m, 12.X.1996; 1♀, same data, 1♀, Mt. Vitsi, mountain slope, 40°39'44N, 21°34'57E, 1800m, on *Crocus* spp., 18.V.1996; 3♀♀, same data, 18.IV.1996; 1♂, Nimféo, mountain slope, 40°38'45N, 21°29'29E, 1350m, on *Origanum* spp., 3.VIII.1996; 1♂, same data, 4.VIII.1996; 1♂, Milióna, uncultivated field, 40°49'28N, 21°07'54E, 1050m, on *Alkanna* spp., 1.VII.1995; 1♂, same data but on *Carduus* spp., 14.VIII.1995; 1♂, Agios Ahilios, uncultivated field in lake island, 40°47'05N, 21°05'00E, 850m, on *Carduus* spp., 14.VIII.1995; 1♂, Preváli Préspa, mountain slope, 40°45'18N, 21°10'26E, on *Epilobium* spp., 1.VI.1996.

### Subgenus *Sibiricobombus* VOGT 1911

#### *Bombus niveatus* KRIECHBAUMER 1870

**Literature records:** (ALFKEN 1927: Kriti-Haniá) subspecific name noted; (PITTIONI 1938: Mt. Parnassós) subspecific name noted. Reported under the taxonomic status *Bombus vorticosus* GERSTAECKER 1872: (ANAGNOSTOPOULOS 1999: Flórina, Flórina-Préspa, Ebritania); (PITTIONI 1938: Epirus, Pátra, Mt. Parnassós); (REINIG 1966: Mt. Olympos); (BOLCHI SERINI & MARIANELLI 1994).

**Comments:** *Bombus niveatus* and *Bombus vorticosus* have been regarded both as conspecific (WILLIAMS 1998) and as separate species (PITTIONI 1938, REINIG 1981, TKALCÜ 1969). I generally agree with the discussion of the taxonomic status for these species as presented by WILLIAMS (1998) were they are treated as part of a single variable species of two colour forms. All specimens collected and presented in this paper are of the *Bombus vorticosus* colour form.

**Collected material examined:** Greece, Flórina Prefecture: 1♂, Mt. Vigla, beech forest, 40°46'26N, 21°15'58E, 1600m, on *Epilobium* spp., 13.VIII.1995; 1♀, Flórina, farmland field, 40°46'17N, 21°25'08E, 650m, on *Vicia* spp., 7.VI.1996; 1♂, same data but on *Echium* spp., 13.VII.1995; 1♂, Ano Klinés, uncultivated field, 40°50'N, 21°22'E, 600m, on *Echium* spp., 25.VI.1996; 1♂, Mesókabos, uncultivated field, 40°54'04N, 21°30'43E, 600m, on *Echium* spp., 5.VI.1996; 1♂, same data, 9.VII.1996.

### New records of *Bombus* for Greece

#### *Bombus (Psithyrus) bohemicus* SEIDL 1837

**Collected material examined:** Greece, Flórina Prefecture: 1♀, Mt. Vitsi, mountainous topography, 40°39'44N, 21°34'57E, 1800m, on *Crocus* spp., 18.V.1996.

#### *Bombus (Ps.) campestris* (PANZER 1801)

**Collected material examined:** Greece, Flórina Prefecture: 2♂♂, Nimféo, mountainous topography, 40°38'45N, 21°29'29E, 1350m, on *Origanum* spp., 4.V.1996.

#### (?)*Bombus (Ps.) maxillosus* KLUG 1817

**Collected material examined:** Greece, Flórina Prefecture: 4♂♂, Nimféo, mountainous topography, 40°38'45N, 21°29'29E, 1350m, on *Origanum* spp., 3.VIII.1996; 7♂♂, same data, 4.VIII.1996; 1♂, same data but on *Carduus* spp.; 4♀♀, Niki, farm land, beside agricultural field road, 40°53'49N, 21°24'36E, 600m, on *Vicia* spp., 9.VI.1996.

**Comments:** In future systematic studies this taxon might be considered conspecific with *Bombus (Ps.) barbutellus* (KIRBY 1802) because of their close similarity in morphology and habitat and thus specimens cannot always be distinguished reliably (RASMONT 1988, WILLIAMS 1998).

#### *Bombus (Thoracobombus) deuteronymus* SCHULZ 1906

**Collected material examined:** Greece, Flórina Prefecture: 2♀, Flórina, farmland field, 40°46'17N, 21°25'08E, 650m, on *Vicia* spp., 7.VI.1996.

**Comments:** REINIG (1974) mentions that the distribution of *Bombus (Th.) deuteronymus* SCHULZ 1906 covers South East Europe and Balkan territories, which by definition include parts of Greece. Reinig does not however state Greece by name. To my knowledge there is no published record of *Bombus (Th.) deuteronymus* SCHULZ 1906 for Greece. Thus from the identification of the collected material Reinig's distribution range for this species proves to be correct and the presentation of this bee as a new species record for Greece can be justified.

***Bombus (Th.) sylvarum* (LINNAEUS 1761)**

Collected material examined: Greece, Flórina Prefecture: 1♂, Flórina, foraging in township, 40°46'N, 21°22'E, 650m, on *Tagetes* spp., 30.IX.1995; 4♂♂, Néos Káfkasos, farm field, 40°54'30N, 21°28'29E, 550m, on *Carduus* spp., 5.IX.1995; 2♀♀, Niki, farm land, beside agricultural field road, 40°53'49N, 21°24'36E, 600m, on *Vicia* spp., 9.VI.1996; 1♀, Flórina, farmland field, 40°46'17N, 21°25'08E, 650m, on *Vicia* spp., 7.VI.1996; 1♀, S. Ioannidis, mountain slope, 40°46'43N, 21°20'39E, 750m, on *Vicia* spp., 1.VI.1996; 1♂, Pérasma, farm field, 40°45'40N, 21°27'33E, 600m, on *Alkanna* spp., 2.VII.1995; 1♂, Flórina, uncultivated field, 40°46'17N, 21°25'08E, 650m, on *Carduus* spp., 3.VIII.1995; 1♂, same data but on *Echium* spp., 24.VI.1996.

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**Zusammenfassung**

Die griechische Hummelfauna ist von faunistischen Studien und aus Angaben über Bestäuber einigermaßen bekannt. Aus der Literatur waren bisher 23 Arten bekannt. Vorliegende Arbeit behandelt einerseits Hinweise zur vorhandenen Literatur zur griechischen Hummelfauna und gibt erklärende Kommentare zu einigen Arten. Andererseits werden Aufsammlungen ausgewertet, mit besonderem Schwerpunkt Flórina - Nordwest Mazedonien. Dieses Material bestätigt 17 der bisher aus der Literatur bekannten Arten, folgende fünf Arten sind neu für die griechische Fauna und erhöhen die nachgewiesene Artenzahl der Gattung *Bombus* somit auf 28: *Bombus (Psithyrus) bohemicus* SEIDL 1837, *B. (Ps.) campestris* (PANZER 1801), *B. (Ps.) maxillosus* KLUG 1817, *B. (Thoracobombus) deuteronymus* SCHULZ 1906, *B. (Th.) sylvarum* (LINNAEUS 1761).

**Περίληψη**

Τα έως τώρα καταγραμμένα είδη βομβίνων (*Bombus* LATREILLE 1802) της Ελλάδος προέρχονται από δημοσιευμένες εργασίες που αφορούν γενικά στην εντομοπανίδα της χώρας, αλλά και από ειδικές εργασίες σχετικά με τους βομβίνους και τα υπόλοιπα έντομα επικονιαστές. Από τις δημοσιευμένες εργασίες προκύπτει ότι η βομβο-εντομοπανίδα της Ελλάδος αποτελείται από 23 είδη βομβίνων, που παρουσιάζονται εδώ με βάση την ισχύουσα διεθνή ονοματολογία και με σχόλια που αφορούν στη συστηματική τους κατάταξη. Επίσης, στην εργασία παρουσιάζονται πρωτογενή δεδομένα, προερχόμενα από συλλογές εντόμων που έλαβαν χώρα κυρίως στην περιοχή του νομού Φλώρινας. Με βάση το συλλεγένο υλικό, επιβεβαιώθηκε η παρουσία 17 από τα 23 καταγραμμένα είδη της βιβλιογραφίας, προέκυψαν αρκετές νέες καταγραφές προϋπαρχόντων ειδών για τον Ελλαδικό χώρο, καθώς και πέντε νέα είδη για την Ελλάδα: *Bombus (Psithyrus) bohemicus* SEIDL 1837, *B. (Ps.) campestris* (PANZER 1801), *B. (Ps.) maxillosus* KLUG 1817, *B. (Thoracobombus) deuteronymus* SCHULZ 1906, *B. (Th.) sylvarum* (LINNAEUS 1761). Στην εργασία δίνεται ο νέος ενημερωμένος κατάλογος για τα παραπάνω 28 είδη βομβίνων της Ελλάδος.

## References

- ALFKEN J.D. (1927): Zoologische Steifzuge in Attica, Morea und besonders auf der Insel Kreta. II. Hymenoptera: Apidae. — Abh. Nat. Ver. Bremen **36**: 432-448.
- ANAGNOSTOPOULOS I.Th. (1996): The bumble bees of Greece, first results of a biogeographical study. — *Melissokomiki Epiteorisi* **10**: 122-123.
- ANAGNOSTOPOULOS I.Th. (1997): Bumble bees stealing honey from honey bee colonies. — *Melissokomiki Epiteorisi* **11**: 141-142.
- ANAGNOSTOPOULOS I.Th. (1999): A first species list of the bumblebee fauna recorded in Greece, (Hymenoptera: Apidae). — Proceedings of the "7th National (Greek) Entomological Meeting", 21-24 October 1997, Kavala, Greece: 117-124.
- ATANASSOV N. (1965): Hymenoptera von der Insel Thasos. — Bulletin de l'Institut de Zoologie et Musée. Académie des Sciences de Bulgarie **19**: 85-99.
- BLIONIS G.J. & D. VOKOU (2001): Pollination of *Campanula* species on Mt. Olympos, Greece. — *Ecography* **24**: 287-297.
- BOLCHI SERINI G. & P. MARIANELLI (1994): La collezione di *Bombus* LATR. Del Museo Civico di Storia Naturale di Milano. — *Boll. Zool. Agr. Bachic. Ser. II* **26**: 1-26.
- CHITTKA L., INGS T.C. & N.E. RAINE (2004): Chance and adaptation in the evolution of island bumblebee behaviour. — *Popul. Ecol.* **46**: 243-251.
- DRENOWSKI A. (1934): Beitrag zur Insektenfauna von Bulgarien und Mazedonien. — *Mitteil. der Bulgarischen Entomologischen Gesellschaft in Sofia* **8**: 174-182.
- ESTOUP A., SOLIGNAC M., CORNUET J.-M., GOUDET J. & A. SCHOLL (1996): Genetic differentiation of continental and island populations of *Bombus terrestris* (Hymenoptera: Apidae) in Europe. — *Mol. Ecol.* **5**: 19-31.
- FRIESE H. (1923): Eine Kriegsausbeute an Apiden (Bienen) aus Makedonien. — *Zool. Jahrb. Syst.* **46**: 175-216.
- GUMBERT A. & J. KUNZE (2001): Colour similarity to rewarding model plant affects pollination in a food deceptive orchid, *Orchis boryi*. — *Biol. J. Linn. Soc.* **72**: 419-433.
- INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE (1996): Opinion 1828. *Apis terrestris* LINNAEUS, 1758, *A. muscorum* LINNAEUS, 1758 and *A. lucorum* LINNAEUS, 1761 (currently *Bombus terrestris*, *B. muscorum* and *B. lucorum*) and *Bombus humilis* ILLIGER, 1806 (Insecta, Hymenoptera): specific names conserved, and neotypes designated for *B. terrestris* and *B. muscorum*. — *Bull. Zool. Nomencl.* **53**: 64-65.
- KOULIANOS S. (1999): Phylogenetic relationships of the bumblebee subgenus *Pyrobombus* (Hymenoptera: Apidae) inferred from mitochondrial cytochrome b and cytochrome oxidase I sequences. — *Ann. Entomol. Soc. Am.* **92**: 355-358.
- LØKEN A., PEKKARINEN A. & P. RASMONT (1994): Case 2638. *Apis terrestris* LINNAEUS, 1758, *A. muscorum* LINNAEUS, 1758 and *A. lucorum* LINNAEUS, 1761 (currently *Bombus terrestris*, *B. muscorum* and *B. lucorum*) and *Bombus humilis* ILLIGER, 1806 (Insecta, Hymenoptera): proposed conservation of usage of the specific names. — *Bull. Zool. Nomencl.* **51**: 232-236.
- LYDAKI M.E. & J.C. VLAHOS (2000): Natural and artificial pollination of *Ebenus cretica* L. — *Acta Horticulturae* **541**: 113-117.
- MAVROMOUSTAKIS G.A. (1959): A contribution to our knowledge of the bees (Hymenoptera, Apoidea) of the Island of Rhodos (Greece). Part I. — *Annals and Magazine of Natural History Ser. 13*, **2**: 281-302.
- NUTTMAN C. & P. WILLMER (2003): How does insect visitation trigger floral colour change? — *Ecol. Entomol.* **28**: 467-474.
- ÖZBEK H. (2002): On the bumblebee fauna of Turkey: IV. The Subgenera *Megabombus*, *Eversmannibombus*, *Laesobombus*, *Rhodobombus* and *Subterraneobombus* (Hymenoptera, Apidae, Bombini). — *Zoology in the Middle East* **25**: 79-98.

- PAGANETTI-HUMMLER G. (1912): Beitrag zur Apidenfauna zu Corfu. — Z. wiss. Insbiol. 8: 380-381.
- PEAT J., DARVILL B., ELLIS J. & D. GOULSON (2005): Effects of climate on intra- and interspecific size variation in bumble-bees. — Funct. Ecol. 19: 145-151.
- PETANIDOU T. (1991): Pollinating fauna of a phrygane ecosystem: species list. — Verslagen en technische Gegevens, Amsterdam 59: 1-12.
- PETANIDOU T. (1993): Bee pollination in phrygana – Facts and Actions. — In: Bees for Pollination (E. Bruneau, ed. Luxembourg): 37-47.
- PITTIONI B. (1938): Die Hummeln und Schmarotzerhummeln der Balkan-Halbiusel. Mit besonderer Berücksichtigung der Fauna Bulgariens. I. Allgemeiner Teil. — Mitt. Königl. nat. Inst. Sof. 11: 12-69.
- PITTIONI B. (1939): Die Hummeln und Schmarotzerhummeln der Balkan-Halbinsel. II. Spezieller Teil. — Mitt. Königl. nat. Inst. Sof. 12: 49-115.
- PITTIONI B. (1941): Die Variabilität des *Bombus agrorum* F. in Bulgarien. Eine variationsstatistisch Untersuchung unter Berücksichtigung geographischer und ökologischer Faktoren. — Mitt. Königl. nat. Inst. Sof. 14: 238-311.
- POOLE R.W. (1996): Nomina insecta nearctica [sic], a checklist of the insects of North America. Volume 2: Hymenoptera, Mecoptera, Megaloptera, Neuroptera, Raphidioptera, Trichoptera. Rockville, Maryland: 1-793.
- RASMONT P. (1983): Catalogue commenté des bourdons de la région ouest-paléarctique (Hymenoptera, Apoidea, Apidae). — Notes Fauniques de Gembloux 7: 1-71.
- RASMONT P. (1984): Les bourdons du genre *Bombus* LATREILLE sensu stricto en Europe Occidentale et Centrale (Hymenoptera, Apidae). — Spixiana 7: 135-160.
- RASMONT P. (1988): Monographie écologique et zoogéographique des bourdons de France et de Belgique (Hymenoptera, Apidae, Bombinae). — 309+Ixi pp. Ph.D. thesis, Faculté des Sciences agronomiques de l'Etat, Gembloux.
- RASMONT P., REGALI A., INGS T.C., LOGNAY G., BAUDART E., MARLIER M., DELCARTE E., VIVILLE P., MAROT C., FALMAGNE P., VERHAEGHE J.-C. & L. CHITTKA (2005): Analysis of pollen and nectar of *Arbutus unedo* as a food source for *Bombus terrestris* (Hymenoptera: Apidae). — J. Econ. Entomol. 98: 656-663.
- REINIG W.F. (1939): Die Evolutionsmechanismen, erläutert an den Hummeln. — Verhandlungen der Deutschen zoologischen Gesellschaft (supplement) 12: 170-206.
- REINIG W.F. (1966): *Bombus lapponicus* (FABRICIUS 1793) ein für den Olymp neues Eiszeitrelikt (Hym. Apidae). — Nachrichtenbl. bayer. Ent. 15: 81-85.
- REINIG W.F. (1974): Zur Verbreitung einiger Hummelarten auf der Balkan-Halbinsel (Hym., Bombidae). — Nachrichtenbl. bayer. Ent. 23: 11-13.
- REINIG W.F. (1981): Synopsis der in Europa nachgewiesenen Hummel- und Schmarotzerhummelarten (Hymenoptera, Bombidae). — Spixiana 4: 159-164.
- SCHWARZ M., GUSENLEITNER F., WESTRICH P. & H.H. DATHE (1996): Katalog der Bienen Österreichs, Deutschlands, und der Schweiz (Hymenoptera, Apidae). — Entomofauna 8: 1-398.
- STRAND E. (1915): Apidae von Creta. — Archiv für Naturg. 81: 145-148.
- SVENSSON B.G. (1979): *Pyrobombus lapponicus* auct., in Europe recognized as two species: *P. lapponicus* (FABRICIUS, 1793) and *P. monticola* (SMITH, 1849) (Hymenoptera, Apoidea, Bombinae). — Entomol. Scand. 10: 275-296.
- TEPPNER H. (1995): Blüten und Blütenbesucher die *Onosma* (Boraginaceae – Lithospermeae). — Feddes Repertorium 106: 525-532.
- THRASYVOULOU A. & B. TSIRAKOGLU (1998): Observations on *Phacelia tanacetifolia* as a food plant for honey bees and other insects. — Entomol. Hell. 12: 47-53.

- TKALCŪ B. (1969): Ergebnisse der Albanien-Expedition 1961 des Deutschen Entomologischen Institutes. 78. Beitrag. Hymenoptera: Apidae IV (Bombinae). — Beitr. Ent., Berlin 19: 887-916.
- VIARD F., FRANCK P., DUBOIS M.-P., ESTOUP A. & P. JARNE (1998): Variation of microsatellite size homoplasy across electromorphs, loci, and populations in three invertebrate species. — J. Mol. Evol. 47: 42-51.
- VOKOU D., PETANIDOU T. & D. BELLOS (1990): Pollination ecology and reproductive potential of *Jankaia heldreichii* (Gesneriaceae); a Tertiary relict on Mt. Olympus, Greece. — Biol. Conserv. 52: 125-133.
- WARNCKE K. (1986): Die Wildbienen Mitteleuropas ihre gültigen Namen und ihre Verbreitung (Insecta: Hymenoptera). — Entomofauna 3: 1-128.
- WARNCKE K. (1988): Isolierte Bienenvorkommen auf dem Olymp in Griechenland (Hymenoptera, Apidae). — Linzer biol. Beitr. 20: 83-117.
- WILLIAMS P.H. (1998): An annotated checklist of bumble bees with an analysis of patterns of description (Hymenoptera: Apidae, Bombini). — Bull. Br. Mus. (Nat. Hist.) Entomol. 67: 79-152.
- YENINAR H., DUCHATEAN M.J., KAFTANOGLU O. & H. VELTHUIS (2000): Colony developmental patterns in different local populations of the Turkish bumble bee, *Bombus terrestris dalmatinus*. — J. Apicult. Res. 39: 107-116.

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