

## Conservation importance of the melliferous plants of the Bulgarian flora

ALEXANDER TASHEV  
EVGENIA PANCHEVA

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В статті представлена класифікація 1010 видів, які належать до 296 родів та 84 родин диких медоносних рослин. Особлива увага приділялася характеристиці природоохоронного значення цих рослин на національному та міжнародному рівні. Серед них 201 вид, які належать до 71 роду та 36 родин та були визнані, як такі, що мають певний природоохоронний статус в Болгарії та Європі. Більшість з них є ендеміками Болгарії і/або Балканського півострова і охороняються згідно з національним болгарським законодавством або міжнародними конвенціями ратифікованими Болгарією. Результати показують, що суттєва частина медоносних видів рослин болгарської флори має високу природоохоронну цінність.

*Ключові слова:* Болгарія, флора, медоносні рослини, природоохоронна цінність

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The paper presents a classification of 1010 species, belonging to 296 genera and 84 families of wild melliferous plants. A particular attention is given to the characteristics of the conservational importance of these plants at national and international level. Two hundred and one of these species belonging to 71 genera and 36 families were considered to have some conservational status in Bulgaria and Europe. Many of them are endemics for Bulgaria and/or Balkan Peninsula and are protected by the national Bulgarian legislation or by international conventions ratified by Bulgaria. The results indicate that substantial part of melliferous plant species of the Bulgarian flora is of high conservation value.

*Key words:* Bulgaria, flora, melliferous plants, conservation value

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В статье представлена классификация 1010 видов, которые принадлежат к 296 родам и 84 семействам диких медоносных растений. Особое внимание уделялось характеристике природоохоронного значения этих растений на национальном и международном уровне. Среди них 201 вид, которые принадлежат к 71 роду и 36 семействам и были признаны, как имеющие определенный природоохоронный статус в Болгарии и Европе. Большинство из них являются эндемиками Болгарии и/или Балканского полуострова и охраняются согласно с национальным болгарским законодательством или международными конвенциями ратифицированными Болгарией. Результаты указывают, что значительная часть медоносных видов растений болгарской флоры имеет высокую природоохоронную ценность.

*Ключевые слова:* Болгария, флора, медоносные растения, природоохоронная ценность

Melliferous plants are these, whose flowers are natural food source for honey-bee (*Apis mellifera* L.). Based on critical analysis of literature data, it was established that wild

melliferous plants in Bulgaria are represented by 1010 species from 296 genera, 84 families and two phyla [TASHEV, PANCHEVA, 2010]. This represents 25,3% of the species, 31,7% of the genera and 54,9% of the families of the Bulgarian flora [TASHEV, 2008].

Being an integral part of the plant kingdom, melliferous plants are characterized by different life-histories, different ecology and conservation status. The assessment of their conservation status is an important part of the modern concepts and practices for sustainable use of plant resources and conservation of plant diversity. Therefore, the aim of the present study was to characterize the conservation importance of the wild melliferous plants of Bulgarian flora. National and international documents were used for this assessment, with particular reference to the endemic taxa.

### **Material and Methods**

In the determination of the national conservation status of the melliferous plants from the Bulgarian flora, we used the Red Data Book of Bulgaria, Volume I – Plants [VELCHEV, 1984], Red Data Book of Bulgaria, Volume I – Plant and Fungi (Peev in press). We also used the national legislation treating the legal protection of the plant species [BIODIVERSITY ACT; ANONYMOUS, 2002]. Determination of the international status of the analyzed species is based on the Red List of Endangered Plants of IUCN [WALTER, GILLET, 1998] as well as on the “List of Rare, Endangered and Endemic Plants of Europe” [LUCAS, 1983]. We also used the CITES [ANONYMOUS, 1973] and the Convention on the Conservation of European Wildlife and Natural Habitats called also Bern Convention [ANONYMOUS, 1979]. The Balkan and Bulgarian endemics were determined following Assyov and Petrova [2006].

### **Results and Discussion**

Table 1 shows that considerable part of melliferous plants of Bulgarian flora is important from conservation point of view and the species are included in the Red Data Book of Bulgaria, Volume I – Plants (Velchev 1984). They are totally 112 species, or 11,1% of all species of this group. Among them with category “Rare” (R) are 78 species, and with category “Endangered” (EN) – 34 species. In percents, compared to the whole number of melliferous plants of the Bulgarian flora, the distribution is as follows: 7,7% “Rare” and 3,4% “Endangered”. When compared to the number of all wild melliferous plants, included in the Red Data Book of Bulgaria, 69,6% are “Rare” and 30,4% are “Endangered”.

In the new edition of the Red Data Book of Bulgaria, Volume I – Plants and Fungi (Peev in press), the number of melliferous plants is reduced to 74 species (7,4%). This could be explained by the fact that many of the species included in the first edition of the Red Data Book (Velchev 1984) had category “Rare”, which does not exist in the new edition. This is because it considers only IUCN threatened categories, i.e. “Extinct”, “Critically Endangered”, and “Endangered”. A few species labeled as “Rare” in Velchev (1984) were included with the category “Vulnerable” in the Red List of Bulgarian vascular plants (Petrova and Vladimirov 2009). The new edition of the Red Data Book of Bulgaria includes 43 species with the category “Endangered” (EN), which is 4,3% of all wild melliferous plants; “Critically Endangered” (CR) are 26 (2,6%) species, and “Vulnerable” (VU) are 5 (0,5%) species.

Comparison of the plant taxa in the two Red Data Book editions shows that 50 melliferous species are present in both of them. This means that in the period after the publication of the first edition (more than 25 years), 24 wild melliferous species have acquired conservation importance. Eighteen species were transferred from category “Rare” to category “Endangered”; 11 species from category “Rare” to category “Critically Endangered”; 2 species from category “Rare” to category “Vulnerable”, and 5 species from category “Endangered” to category “Critically Endangered”. This unequivocally means that the populations’ status of the rare melliferous plants is getting worse.

Table 1

## Conservation status of melliferous plants of Bulgarian flora

Family/Species	Conservation importance						Measures taken				No of documents including the taxon *
	Red Data Book of Bulgaria (1984)	Red Data Book of Bulgaria (Peev)	IUCN (1998)	Eur. List, (1983)		Bulgarian endemic	Balkan endemic	Biodiv. Act (2007)	Bern. conv. (1979)	CITES Appendix 2 (1973)	
				BG	EU						
1	2	3	4	5	6	7	8	9	10	11	12
<b>Acanthaceae</b>											
<i>Acanthus spinosus</i> L.	R	EN	-	-	-	-	-	+	-	-	3
<i>Acanthus balcanicus</i> Heywood et Richardson	-	-	-	-	-	-	+	-	-	-	1
<b>Alliaceae</b>											
<i>Allium angulosum</i> L.	R	CR	-	-	-	-	-	+	-	-	3
<i>Allium montanum</i> F. W. Schmidt	EN	-	-	-	-	-	-	+	-	-	2
<i>Allium rhodopaeum</i> Velen.	-	-	-	-	-	+	-	-	-	-	1
<b>Amaryllidaceae</b>											
<i>Galanthus elwesii</i> Hook. f.	EN	EN	-	-	-	-	-	+	-	+	4
<i>Galanthus nivalis</i> L.	EN	EN	-	-	-	-	-	+	-	+	4
<i>Leucojum aestivum</i> L.	EN	-	-	-	-	-	-	-	-	-	1
<b>Apiaceae (Umbelliferae)</b>											
<i>Anethum graveolens</i> L.	R	EN	-	-	-	-	-	-	-	-	2
<i>Heracleum angustisectum</i> (Stoj. et Acht.) Peev	R	-	-	-	-	+	-	-	-	-	2
<i>Heracleum verticillatum</i> Panč.	-	-	-	-	-	-	+	-	-	-	1
<b>Asteraceae (Compositae)</b>											
<i>Hieracium ančevii</i> Szlag	-	-	-	-	-	+	-	-	-	-	1
<i>Hieracium asenovgradense</i> Jasiewicz & Pawl.	-	-	-	-	-	+	-	-	-	-	1
<i>Hieracium belogradčense</i> T. Georg. & Kitanov	-	CR	-	-	-	+	-	+	-	-	3
<i>Hieracium divergens</i> Naeg. & Peter	-	-	-	-	-	+	-	-	-	-	1
<i>Hieracium dolopicum</i> Freyn & Sint.	-	-	-	-	-	-	+	-	-	-	1
<i>Hieracium ferdinandii-regis</i> Zahn	-	-	-	-	-	+	-	-	-	-	1
<i>Hieracium gregorii-bakuriani</i> S. Bräut.	-	-	-	-	-	+	-	-	-	-	1
<i>Hieracium heldreichii</i> Boiss.	-	-	-	-	-	-	+	-	-	-	1
<i>Hieracium heterogynum</i> (Froel.) Gut.	-	-	-	-	-	-	+	-	-	-	1
<i>Hieracium kittaniae</i> Vladimirov	-	EN	-	-	-	+	-	-	-	-	2
<i>Hieracium marmoreum</i> Panč.	-	-	-	-	-	-	+	-	-	-	1
<i>Hieracium matffeldianum</i> Zahn	-	-	-	-	-	+	-	-	-	-	1
<i>Hieracium merxmullerianum</i> S. Bräut.	-	-	-	-	-	+	-	-	-	-	1
<i>Hieracium naegelianum</i> Panč.	-	-	-	-	-	-	+	-	-	-	1
<i>Hieracium nipholasum</i> T. Georg. & Zahn	-	-	-	-	-	+	-	-	-	-	1

1	2	3	4	5	6	7	8	9	10	11	12
<i>Hieracium olympicum</i> Boiss.	-	-	-	-	-	-	+	-	-	-	1
<i>Hieracium ossaeum</i> Zahn	-	-	-	-	-	-	+	-	-	-	1
<i>Hieracium pannosum</i> Boiss.	-	-	-	-	-	-	+	-	-	-	1
<i>Hieracium petrovae</i> Vladimirov & Szelag	-	-	-	-	-	+	-	-	-	-	1
<i>Hieracium pilosissimum</i> Friv.	-	-	-	-	-	-	+	-	-	-	1
<i>Hieracium pirinicola</i> T. Georg. & Zahn	-	-	-	-	-	+	-	-	-	-	1
<i>Hieracium pseuderiopis</i> Zahn	-	-	-	-	-	-	+	-	-	-	1
<i>Hieracium scardicum</i> Bornm. & Zahn	-	-	-	-	-	-	+	-	-	-	1
<i>Hieracium sericophyllum</i> Nejščeff	-	-	-	-	-	-	+	-	-	-	1
<i>Hieracium stefanofii</i> Zahn	R	-	-	-	-	+	-	-	-	-	2
<i>Hieracium tomassinii</i> Rchb.	-	-	-	-	-	-	+	-	-	-	1
<i>Hieracium urumoffii</i> Nejščeff & Zahn	-	-	-	-	-	+	-	-	-	-	1
<i>Hieracium villosum</i> L.	-	EN	-	-	-	-	-	-	-	-	1
<i>Hieracium virosum</i> Pall.	-	EN	-	-	-	-	-	-	-	-	1
<b>Berberidaceae</b>											
<i>Epimedium pubigerum</i> (DC.) Morren & Decne	R	-	-	-	-	-	-	+	-	-	2
<b>Boraginaceae</b>											
<i>Anchusa davidovii</i> Stoj.	-	CR	-	-	-	+	-	+	-	-	3
<i>Anchusa hybrida</i> Ten.	R	-	-	-	-	-	-	-	-	-	1
<i>Buglossoides arvensis</i> (L.) I. M. Johnst.	R	-	-	-	-	--	-	-	-	-	1
<i>Buglossoides grandulosa</i> (Velen.) R. Fernandes	R	-	R	V	V	-	-	+	-	-	4
<i>Buglossoides sibthorpiana</i> (Griseb.) Czer.	R	-	-	-	-	-	-	-	-	-	1
<i>Echium plantagineum</i> L.	R	-	-	-	-	-	-	-	-	-	1
<i>Echium russicum</i> J. F. Gmel.	-	VU	-	-	-	-	-	+	-	-	2
<i>Myosotis aspera</i> Velen.	-	-	-	-	-	+	-	-	-	-	1
<i>Myosotis jordanovii</i> N. Andreev & Peev	-	-	-	-	-	+	-	-	-	-	1
<i>Myosotis macedonica</i> Velen. & Charrel	-	-	-	-	-	-	+	-	-	-	1
<i>Myosotis orbelica</i> (Velen.) Peev & N. Andreev	-	-	-	-	-	+	-	-	-	-	1
<i>Myosotis rhodopea</i> Velen.	-	-	-	-	-	+	-	-	-	-	1
<i>Myosotis suaveolens</i> Waldst & Kit.	-	-	-	-	-	-	+	-	-	-	1
<i>Onosma heterophylla</i> Griseb.	R	-	-	-	-	-	-	-	-	-	1
<i>Onosma thracica</i> Velen.	-	-	-	nt	-	-	+	-	-	-	2
<i>Onosma rhodopea</i> Velen.	EN	EN	R	I	R	-	+	+	-	-	6
<i>Symphytum tauricum</i> Willd.	R	EN	-	-	-	-	-	-	-	-	2
<i>Trachystemon orientalis</i> (L.) G. Don	R	-	-	-	-	-	-	-	-	-	1
<b>Brassicaceae (Cruciferae)</b>											
<i>Alyssum cuneifolium</i> Ten. var. <i>pirinicum</i> Stoj. & Acht.	R	EN	-	-	-	-	-	+	-	-	3
<i>Alyssum pulvinare</i> Velen.	R	-	-	-	-	-	-	-	-	-	1

1	2	3	4	5	6	7	8	9	10	11	12
<i>Alyssum sibirnyi</i> Velen.	R	-	-	-	-	-	-	+	-	-	2
<i>Matthiola odoratissima</i> (M. Bieb.) R. Br.	EN	CR	-	V	V	-	-	+	-	-	4
<b>Caesalpiniaceae</b>											
<i>Cercis siliquastrum</i> L.	R	-	-	-	-	-	-	-	-	-	1
<b>Campanulaceae</b>											
<i>Campanula cochlearifolia</i> Lam.	-	EN	-	-	-	-	-	-	-	-	1
<i>Campanula euxina</i> (Velen.) Ančev	-	EN	-	-	-	+	-	+	-	-	3
<i>Campanula jordanovii</i> Ančev & Kovanda	-	VU	-	-	-	-	+	+	-	-	3
<i>Campanula lanata</i> Friv.	-	VU	R	-	-	-	+	+	+	-	5
<i>Campanula latifolia</i> L.	R	EN	-	-	-	-	-	+	-	-	3
<i>Campanula moesiaca</i> Velen.	-	-	-	-	-	-	+	-	-	-	1
<i>Campanula orphanidea</i> Boiss.	-	EN	-	-	-	-	+	+	-	-	3
<i>Campanula patula</i> L.	-	-	-	-	-	-	-	-	+	-	1
<i>Campanula scutellata</i> Griseb.	-	-	-	-	-	-	+	-	-	-	1
<i>Campanula sparsa</i> Friv.	-	-	-	-	-	-	+	-	-	-	1
<i>Campanula thyrsoides</i> L.	-	EN	-	-	-	-	-	-	-	-	1
<i>Campanula transilvanica</i> Schur ex Andrae	R	EN	R	R	I	-	-	+	-	-	5
<i>Campanula trojanensis</i> Kovanda & Ančev	-	-	-	-	-	+	-	-	-	-	1
<i>Campanula velebitica</i> Borbas	-	-	-	-	-	-	+	-	-	-	1
<i>Campanula versicolor</i> Andrews	EN	EN	-	-	-	-	-	+	-	-	3
<b>Cistaceae</b>											
<i>Cistus salvifolius</i> L.	R	EN	-	-	-	-	-	+	-	-	3
<b>Elaeagnaceae</b>											
<i>Hippophae rhamnoides</i> L.	EN	CR	-	-	-	-	-	+	-	-	3
<b>Ericaceae</b>											
<i>Calluna vulgaris</i> (L.) Hull	R	-	-	-	-	-	-	+	-	-	2
<i>Erica arborea</i> L.	R	-	-	-	-	-	-	+	-	-	2
<i>Rhododendron ponticum</i> L.	EN	-	-	-	-	-	-	+	-	-	2
<i>Vaccinium arctostaphylos</i> L.	EN	EN	-	R	R	-	-	+	+	-	5
<b>Fabaceae (Papilionaceae)</b>											
<i>Anthyllis aurea</i> Weld.	-	-	-	-	-	-	+	-	-	-	1
<i>Chamaecytisus danubialis</i> (Velen.) Rothm.	R	-	-	-	-	-	-	-	-	-	1
<i>Chamaecytisus absinthioides</i> (Janka) Kuzm.	-	-	-	-	-	-	+	-	-	-	1
<i>Chamaecytisus calcareus</i> (Velen.) Kuzm.	-	-	-	-	-	-	+	-	-	-	1
<i>Chamaecytisus jankae</i> (Velen.) Rothm.	-	-	-	-	-	-	+	-	-	-	1
<i>Chamaecytisus frivaldszkyanus</i> (Deg.) Kuzm.	R	EN	-	-	-	+	-	-	-	-	3
<i>Chamaecytisus kovačevii</i> (Velen.) Rothm.	R	EN	-	V	-	+	-	+	-	-	5
<i>Chamaecytisus neičeffii</i> (Urum.) Rothm.	R	-	VU	E	-	+	-	+	-	-	5

1	2	3	4	5	6	7	8	9	10	11	12
<i>Chamaecytisus ratisbonensis</i> (Schaeff.) Rothm.	EN	-	-	-	-	-	-	+	-	-	2
<i>Genista germanica</i> L.	-	CR	-	-	-	-	-	+	-	-	2
<i>Genista pilosa</i> L.	EN	EN	-	-	-	-	-	+	-	-	3
<i>Genista rumelica</i> Velen.	-	-	-	-	-	-	+	-	-	-	1
<i>Genista subcapitata</i> Panč.	-	-	-	-	-	-	+	-	-	-	1
<i>Lathyrus grandiflorus</i> Sibth. et Sm.	R	EN	-	-	-	-	-	-	-	-	2
<i>Lupinus albus</i> L.	R	-	-	-	-	-	-	-	-	-	1
<i>Ononis adenotricha</i> Boiss.	R	-	-	-	-	-	-	-	-	-	1
<i>Ononis repens</i> L.	R	CR	-	-	-	-	-	+	-	-	3
<i>Trifolium affine</i> C. Presl.	-	-	-	R	R	-	-	-	-	-	1
<i>Trifolium dalmaticum</i> Vis.	-	-	-	-	-	-	+	-	-	-	1
<i>Trifolium heldreichianum</i> Hausskn.	-	-	-	-	-	-	+	-	-	-	1
<i>Trifolium pignanii</i> Fauche et Chaub.	-	-	-	-	-	-	+	-	-	-	1
<i>Trifolium trichopterum</i> Panč.	-	-	-	-	-	-	+	-	-	-	1
<i>Trifolium globosum</i> L.	R	-	-	-	-	-	-	-	-	-	1
<i>Trifolium spumosum</i> L.	R	-	-	-	-	-	-	-	-	-	1
<i>Trifolium ligusticum</i> Balb. ex Loisel	EN	EN	-	-	-	-	-	-	-	-	2
<i>Trifolium phleoides</i> Pourr. ex Willd.	EN	CR	-	-	-	-	-	-	-	-	2
<i>Trifolium physodes</i> Stev. ex M. B.	-	CR	-	-	-	-	-	-	-	-	1
<i>Trifolium rubens</i> L.	EN	CR	-	-	-	-	-	-	-	-	2
<i>Trifolium spumosum</i> L.	-	CR	-	-	-	-	-	-	-	-	1
<i>Trifolium squamosum</i> L.	EN	CR	-	-	-	-	-	-	-	-	2
<i>Trifolium squarrosum</i> L.	EN	CR	-	-	-	-	-	-	-	-	2
<i>Trifolium velenovskyi</i> Vandas	-	-	-	-	-	-	+	-	-	-	1
<b>Fagaceae</b>											
<i>Castanea sativa</i> Mill.	EN	EN	-	-	-	-	-	-	-	-	2
<b>Geraniaceae</b>											
<i>Erodium absinthoides</i> Willd.	R	EN	-	-	-	-	+	+	-	-	4
<i>Erodium hoefftianum</i> C. A. Meyer	R	-	-	-	-	-	-	-	-	-	1
<b>Grossulariaceae</b>											
<i>Ribes nigrum</i> L.	R	CR	-	-	-	-	-	+	-	-	3
<b>Hippocastanaceae</b>											
<i>Aesculus hippocastanum</i> L.	EN	EN	-	-	-	-	+	+	-	-	4
<b>Hypericaceae (Guttiferae)</b>											
<i>Hypericum androsaemum</i> L.	R	EN	-	-	-	-	-	+	-	-	3
<i>Hypericum calycinum</i> L.	R	-	-	-	-	-	-	+	-	-	2
<b>Iridaceae</b>											
<i>Crocus veluchensis</i> Herbert	-	-	-	-	-	-	+	-	-	-	1
<b>Lamiaceae (Labiatae)</b>											
<i>Marrubium friwaldskyanum</i> Boiss.	R	VU	-	R	R	+	-	-	-	-	4
<i>Salvia forskahlei</i> L.	EN	-	-	-	-	-	-	+	-	-	2
<i>Salvia pinnata</i> L.	-	CR	-	-	-	-	-	+	-	-	2
<i>Salvia ringens</i> Sibth. & Sm.	-	-	-	-	-	-	+	-	-	-	1

1	2	3	4	5	6	7	8	9	10	11	12
<i>Salvia scabiosifolia</i> Lam.	EN	CR	R	R	R	-	-	+	-	-	5
<i>Salvia verbenaca</i> L.	R	-	-	-	-	-	-	-	-	-	1
<i>Satureja rumelica</i> Velen.	R	-	R	-	I	+	-	-	-	-	4
<i>Satureja pilosa</i> Velen.	-	-	-	nt	-	-	+	-	-	-	2
<i>Teucrium botrys</i> L.	-	-	-	-	-	-	-	+	-	-	1
<i>Teucrium lamiifolium</i> D'Urv.	R	-	-	R	R	-	-	+	+	-	4
<i>Thymus albanus</i> Heinr. Braun	-	-	-	-	-	-	+	-	-	-	1
<i>Thymus atticus</i> Čelak.	-	-	-	-	-	-	+	-	-	-	1
<i>Thymus bracteosus</i> Vis. ex Benth.	-	-	-	-	-	-	-	+	-	-	1
<i>Thymus comptus</i> Friv.	-	-	-	-	-	-	+	-	-	-	1
<i>Thymus longedentatus</i> (Degen & Urum.) Ronniger	-	-	-	-	-	-	+	-	-	-	1
<i>Thymus perinicus</i> (Velen.) Jalas	R	EN	-	-	-	+	-	+	-	-	4
<i>Thymus stojanovii</i> Degen	-	CR	-	-	-	+	-	+	-	-	3
<b>Liliaceae</b>											
<i>Fritillaria pontica</i> Wahlenb.	R	-	R	-	-	-	-	+	-	-	3
<b>Menyanthaceae</b>											
<i>Menyanthes trifoliata</i> L.	EN	EN	-	-	-	-	-	-	-	-	2
<b>Morinaceae</b>											
<i>Morina persica</i> L.	R	-	-	-	-	-	-	+	-	-	2
<b>Orchidaceae</b>											
<i>Platanthera bifolia</i> (L.) Rich.	-	-	-	-	-	-	-	-	-	+	1
<b>Paeoniaceae</b>											
<i>Paeonia mascula</i> (L.) Mill.	EN	EN	-	-	-	-	-	+	-	-	3
<i>Paeonia tenuifolia</i> L.	EN	EN	-	-	-	-	-	+	+	-	4
<b>Polygalaceae</b>											
<i>Polygala acarnanica</i> (Chodat) Koz. et Petrova	R	-	-	-	-	-	+	+	-	-	3
<i>Polygala amarella</i> Crantz	R	EN	-	-	-	-	-	+	-	-	3
<i>Polygala alpestris</i> Reichenb.	-	EN	-	-	-	-	-	+	-	-	2
<i>Polygala carniolica</i> Kern.	R	EN	-	-	-	-	+	-	-	-	3
<i>Polygala hospital</i> Heuff.	R	-	-	-	-	-	-	-	-	-	1
<i>Polygala monspeliaca</i> L.	R	-	-	-	-	-	-	-	-	-	1
<i>Polygala rhodopea</i> (Velen.) Janch.	R	-	-	-	-	-	+	-	-	-	2
<i>Polygala supina</i> Schreb.	R	-	-	-	-	-	-	-	-	-	1
<b>Primulaceae</b>											
<i>Primula deorum</i> Velen.	R	VU	R	-	nt	+	-	+	+	-	7
<i>Primula frondosa</i> Janka	R	EN	R	-	R	+	-	+	+	-	7
<i>Primula halleri</i> G. F. Gmel.	R	-	-	-	-	-	-	+	-	-	2
<i>Primula vulgaris</i> Huds.	R	-	-	-	-	-	-	+	-	-	2
<b>Ranunculaceae</b>											
<i>Adonis microcarpa</i> DC.	-	EN	-	-	-	-	-	-	-	-	1
<i>Adonis vernalis</i> L.	R	-	-	-	-	-	-	-	-	+	2
<i>Adonis wolgensis</i> Stev. in DC.	R	-	-	-	-	-	-	+	-	-	2
<i>Anemone narcissiflora</i> L.	R	-	-	-	-	-	-	+	-	-	2

1	2	3	4	5	6	7	8	9	10	11	12
<i>Anemone sylvestris</i> L.	EN	-	-	-	-	-	-	+	-	-	2
<i>Aquilegia aurea</i> Janka	R	-	-	-	-	-	+	+	-	-	3
<i>Aquilegia nigricans</i> Baumg.	R	-	-	-	-	-	+	+	-	-	3
<i>Caltha cornuta</i> Schott	-	-	-	-	-	-	-	+	-	-	1
<i>Caltha polypetala</i> Hochst. ex Lorent	-	EN	-	-	-	-	-	+	-	-	2
<i>Pulsatilla halleri</i> (All.) Willd.	R	EN	-	-	-	-	-	-	+	-	3
<i>Pulsatilla pratensis</i> (L.) Mill.	R	-	-	-	-	-	-	+	-	-	2
<i>Thalictrum foetidum</i> L.	EN	CR	-	-	-	-	-	+	-	-	3
<i>Trollius europaeus</i> L.	R	-	-	-	-	-	-	+	-	-	2
<b>Rosaceae</b>											
<i>Crataegus orientalis</i> Pall. ex M. B.	-	-	-	-	-	-	-	+	-	-	1
<i>Mespilus germanica</i> L.	R	-	-	-	-	-	-	-	-	-	1
<i>Potentilla chrysantha</i> Trevir.	R	-	-	-	-	-	-	+	-	-	2
<i>Potentilla emili-popii</i> Nyarady	R	CR	R	-	-	-	+	+	+	-	6
<i>Potentilla fruticosa</i> L.	R	-	-	-	-	-	-	-	-	-	1
<i>Potentilla montenegrina</i> Pant.	-	CR	-	-	-	-	-	+	-	-	2
<i>Potentilla nicicii</i> Adam.	R	CR	-	-	-	-	-	+	-	-	3
<i>Potentilla pirotensis</i> (Borb.) Mark.	-	-	-	-	-	-	+	-	-	-	1
<i>Potentilla palustris</i> (L.) Scop.	R	-	-	-	-	-	-	+	-	-	2
<i>Potentilla regis-borisii</i> Stoj.	-	-	-	-	-	-	+	-	-	-	1
<i>Pyracantha coccinea</i> M. Roem.	EN	-	-	-	-	-	-	-	-	-	1
<i>Rubus macrophyllus</i> Weihe & Nees	EN	-	-	-	-	-	-	-	-	-	1
<i>Rubus oblongoobovatus</i> Markova	R	-	-	-	-	+	-	-	-	-	2
<i>Rubus thyrsoiflorus</i> Wehe et Nees	EN	-	-	-	-	-	-	-	-	-	1
<i>Rubus vepallidus</i> Sudre	R	-	-	-	-	-	-	-	-	-	1
<i>Spiraea crenata</i> L.	EN	CR	-	E	V	-	-	+	-	-	4
<i>Spiraea hypericifolia</i> L.	EN	-	-	-	-	-	-	-	-	-	1
<i>Spiraea salicifolia</i> L.	EN	CR	-	-	-	-	-	+	-	-	3
<b>Rutaceae</b>											
<i>Ruta graveolens</i> L.	EN	EN	-	-	-	-	-	+	-	-	3
<b>Salicaceae</b>											
<i>Salix pentandra</i> L.	EN	CR	-	-	-	-	-	+	-	-	3
<i>Salix rosmarinifolia</i> L.	-	CR	-	-	-	-	-	+	-	-	2
<b>Scrophulariaceae</b>											
<i>Pedicularis palustris</i> L.	R	CR	-	-	-	-	-	+	-	-	3
<i>Veronica austriaca</i> L.	R	-	-	-	-	-	-	-	-	-	1
<i>Veronica chamaedrys</i> L.	R	-	-	-	-	-	-	-	-	-	1
<b>Thymelaeaceae</b>											
<i>Daphne laureola</i> L.	R	EN	-	-	-	-	-	+	-	-	3
<i>Daphne pontica</i> L.	R	EN	-	-	-	-	-	+	-	-	3
<b>Tiliaceae</b>											
<i>Tilia rubra</i> DC.	R	-	-	-	-	-	-	-	-	-	1
<b>Valerianaceae</b>											
<i>Valeriana dioscoridis</i> Sm.	R	EN	-	-	-	-	-	-	-	-	2

\* Column 12 represents the number of different documents (Red lists, Red data books and different legislative documents) where the respective taxon is included



Eighty-one (8%) species are protected by the Bulgarian legislation and they are included in the Appendix 3 of the Biodiversity Act from 2007.

Seventeen species (1,7%) are in the “European List of Rare, Endangered and Endemic Plants” (Lucas 1983). It defines the National (BG) and European (EU) status of the species. According to the national status, 6 species are with category “Rare” (R), 3 species with category “Vulnerable” (VU), 2 species with category “Endangered” (E), 1 species with category “Undetermined” (I), and 2 species “neither Rare, nor Endangered”. Accordingly to the European status 7 species are with category “Rare” (R), 3 species with category “Vulnerable” (V), 2 species with category “Undetermined”, and 1 species with category “neither Rare, nor Endangered” (nt).

Eleven melliferous species fall in the IUCN’s Red List of Endangered Species of 1997 (Walter and Gillett 1998). These are: *Buglossoides grandulosa*, *Onosma rhodopea*, *Campanula lanata*, *C. transsilvanica*, *Chamaecytisus nejčeffii*, *Salvia scabiosifolia*, *Satureja rumelica*, *Fritillaria pontica*, *Primula deorum*, *P. frondosa*, and *Potentilla emili-popii*.

Eight European melliferous species are strictly protected under the Bern Convention [ANONYMOUS, 1979], Appendix 2. These are: *Campanula lanata*, *C. patula*, *Vaccinium arctostaphylos*, *Teucrium lamiifolium*, *Paeonia tenuifolia*, *Primula deorum*, *P. frondosa*, *Pulsatilla halleri*, and *Potentilla emili-popii* Nyarady.

Four species are listed in Appendix 2 of the Convention on International Trade in Endangered Species [ANONYMOUS 1973, SUPPLEMENTED IN 2003], and these are: *Galanthus elwesii*, *G. nivalis*, *Platanthera bifolia* and *Adonis vernalis* L.

Thirty three species (3,3%) among the melliferous plants are Bulgarian endemics and 54 (5,3%) are Balkan endemics.

### Conclusion

The data presented so far show that the melliferous plants of the Bulgarian flora amount 201 species from 71 genera and 36 families. This represents 20% of the species, 24,3% of the genera and 42,9% of the families with wild melliferous plants. With the highest conservation status among them are the Bulgarian endemics *Primula deorum* and *P. frondosa*, included in seven lists of conservation importance. They are followed by *Onosma rhodopea*, *Potentilla emili-popii* – present on six lists, *Campanula lanata*, *C. transsilvanica*, *Chamaecytisus kovačevii*, *C. neičeffii*, *Salvia scabiosifolia*, *Vaccinium arctostaphylos* – part of 5 lists, and *Aesculus hippocastanum*, *Buglossoides grandulosa*, *Erodium absinthoides*, *Galanthus elwesii*, *G. nivalis*, *Marrubium friwaldskyanum*, *Matthiola odoratissima*, *Paeonia tenuifolia*, *Satureja rumelica*, *Spiraea crenata*, *Teucrium lamiifolium*, *Thymus perinicus*, which are part of 4 list.

The results outline the high conservation importance of the Bulgarian melliferous plants, both for the national and for the European flora.

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А.В. Єна

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Адреса авторів:

*О. Ташев, Е. Панчева*  
*Університет лісу,*  
*Софія, Болгарія*  
*E-mail: atashev@mail.bg, jeni\_pancheva@abv.bg*

Author's address:

*Alexander Tashev*  
*Evgenia Pancheva*  
*University of Forestry,*  
*Sofia, Bulgaria*  
*E-mail: atashev@mail.bg, jeni\_pancheva@abv.bg*