

UDC 595.799:[069.51.015:59](477.83-25)

**COLLECTION OF BUMBLEBEES (HYMENOPTERA, APIDAE,  
*BOMBUS* LATREILLE, 1802) IN ZOOLOGICAL MUSEUM OF IVAN  
FRANKO NATIONAL UNIVERSITY OF LVIV**

**I. Tymkiv, I. Shydlovskyy, K. Nazaruk, A. Zatushevskyy**

*Ivan Franko National University of Lviv  
4, Hrushevskyyi St., Lviv 79005, Ukraine  
e-mail: irynatymkiv93@gmail.com*

This paper presents qualitative and quantitative analyses of the bumblebees' (*Bombus*) collection, which is kept in the Zoological Museum of Ivan Franko National University of Lviv. The collection includes 719 specimens of bumblebees, belonging to 23 species. The majority of these species were found in the western part of the territory of Ukraine (on the territory of eight regions), few specimens have been collected in Germany (1960) and in Egypt (2005). Unfortunately, there is a little part of specimens, which are lacking information on collecting locality. The basis of the collection is formed of the common and widespread bumblebee species, some rare species (*Bombus argillaceus* and *B. muscorum*) being available as well. The specimens have been collected during 1960–2017, the major part of the collection being made in the period of the last five years. The analysis of this collection shows us the species composition of the bumblebee fauna on the territory of Western Ukraine, and on the some others regions of Ukraine. This inventory will be a basis for a catalogue.

*Keywords:* bumblebees, *Bombus*, Apidae, collections, Zoological Museum

Collections of the Zoological Museum (ZMD [11]) are of a great scientific value, apart from their aesthetic and educational value. They serve as a source and confirmation of information on the faunal diversity of the world, on distribution of common and rare species of animals, and their conservation status.

Whereas a lot is known about vertebrates' collections of the Museum, the knowledge on the collections of invertebrate animals is rather poor, as their treatment at present is on the initial stage.

There is a large number of invertebrate specimens in ZMD, so their identification and making inventory will facilitate further research in collected materials.

Among the collections of invertebrates of the Museum, the freshwater molluscs' collection of Prof. V.I. Zdun [1] and the collection of homopteran insects of E.F. Germar [3] are the first which have already been worked up.

The current paper deals with the inventory of the bumblebee's (Hymenoptera, Apidae, *Bombus*) collection.

**Objects and Methods**

The object of our research is the collection of bumblebees of ZMD. For bumblebee identification we have used A. Løken's keys to species [5, 6] and the classification of bumblebees follows P.H. Williams [9, 10].

**Results and Discussion**

*Species diversity and conservation status*

In general, 40 bumblebee species are known from the whole territory of Ukraine (according to I.B. Konovalova's research [4] there are 41 species, because *B. maxillosus* was served as

a separate species but it is a synonym to *B. barbutellus* now). The museum collection of bumblebees includes 719 specimens, which belong to 23 species (Table 1).

The specimens have been collected during 1960–2017, the major part of the collection being made in the period of the last five years.

Table 1

Species diversity of bumblebees in the collection of ZMD, their conservation status in the Red Data Book of Ukraine (RDBU) [7], conservation categories in the European Red List of Bees (ERLB) [2] and IUCN Red List Categories [8]

Subgenus	Species	N. of specimens	Status in RDBU	Categor. in ERLB	Categor. in IUCN R.L.
<i>Alpigenobombus</i>	<i>Bombus wurflenii</i> Radoszkowski, 1860	4	–	–	–
	<i>Bombus lucorum</i> (Linnaeus, 1761)	39	–	–	–
<i>Bombus s.str.</i>	<i>Bombus terrestris</i> (Linnaeus, 1758)	228	–	–	–
	<i>Bombus semenoviellus</i> Skorikov, 1910	1	–	–	–
<i>Kallobombus</i>	<i>Bombus soroensis</i> (Fabricius, 1777)	1	–	–	–
<i>Megabombus</i>	<i>Bombus argillaceus</i> (Scopoli, 1763)	1	Vulnerable	–	–
	<i>Bombus hortorum</i> (Linnaeus, 1761)	42	–	–	–
<i>Melanobombus</i>	<i>Bombus lapidarius</i> (Linnaeus, 1758)	110	–	–	–
	<i>Bombus barbutellus</i> (Kirby, 1802)	2	–	–	–
	<i>Bombus bohemicus</i> Seidl, 1838	11	–	–	DD
<i>Psithyrus</i>	<i>Bombus campestris</i> (Panzer, 1801)	14	–	–	–
	<i>Bombus rupestris</i> (Fabricius, 1793)	12	–	–	–
	<i>Bombus sylvestris</i> (Le Peletier, 1832)	5	–	–	–
	<i>Bombus vestalis</i> Geoffroy, 1785	10	–	–	–
	<i>Bombus hypnorum</i> Linnaeus, 1758	29	–	–	–
<i>Pyrobombus</i>	<i>Bombus pratorum</i> (Linnaeus, 1761)	22	–	–	–
	<i>Bombus distinguendus</i> Morawitz, 1869	3	–	VU	DD
	<i>Bombus subterraneus</i> (Linnaeus, 1758)	1	–	–	–
<i>Subterraneobombus</i>	<i>Bombus humilis</i> Illiger, 1806	3	–	–	–
	<i>Bombus muscorum</i> (Linnaeus, 1758)	5	Rare	VU	–
	<i>Bombus pascuorum</i> (Scopoli, 1763)	81	–	–	–
<i>Thoracobombus</i>	<i>Bombus ruderarius</i> (Müller, 1776)	54	–	–	–
	<i>Bombus sylvarum</i> Linnaeus, 1761	41	–	–	–

According to I.B. Konovalova's research, the abundance of bumblebee species within their distributional ranges in Ukraine is as follows: nine species of bumblebees, which are presented in the collection of ZMD, are ubiquitous (*Bombus terrestris*, *B. lucorum*, *B. lapidarius*, *B. pratorum*, *B. pascuorum*, *B. bohemicus*, *B. campestris*, *B. rupestris* and *B. vestalis*), eight species are common (*B. soroeensis*, *B. hortorum*, *B. ruderarius*, *B. sylvarum*, *B. hypnorum*, *B. wurflenii*, *B. barbutellus*, *B. sylvestris*), five species are locally abundant (*B. subterraneus*, *B. humilis*, *B. muscorum*, *B. semenoviellus*, *B. argillaceus*) and one species (*B. distinguendus*) is rare in all its habitats [4]. However, taking into consideration the origin of our collection, the regions, from where the specimens have been collected in particular, we must note that such species as *B. soroeensis*, *B. subterraneus*, *B. humilis*, *B. semenoviellus* and *B. argillaceus* should be considered as rare ones within the area of the western part of Ukraine. The species *B. wurflenii* is common only to some areas of certain altitudes in the Ukrainian Carpathians, to which it is restricted.

#### *The origin of the specimens*

The majority of bumblebee specimens (706 specimens – 98,2 %) have been collected in eight regions of Ukraine. The greater part of the collection has originated from Lviv and Ivano-Frankivsk regions (Table 2). Two specimens (*B. sylvarum* and *B. muscorum*) have been collected in Germany (1960), one specimen (*B. rupestris*) is from Egypt (2005) and 10 specimens are lacking information on collecting locality.

Table 2

The origin of the specimens in the bumblebees' collection of ZMD

Country	Regions	Number of specimens
Ukraine	Lviv	489
	Ivano-Frankivsk	119
	Volyn	47
	Zakarpattia	32
	Rivne	13
	Vinnytsia	3
	Zhytomyr	1
	Odessa	1
	Western Ukraine (without exact locality of collection)	1
Germany		2
Egypt		1
Without specified locality of collection		10

The information on labels to specimens can be separated into four main groups: 1) gatherings collected by students and faculty staff during summer educational practice and expeditions; 2) collections by the first author of this article for scientific purpose; 3) collections of bees, damaged by traffic, provided by amateur naturalists; 4) few random specimens from different regions.

The analysis of the bumblebees collection of the Zoological Museum enables to draw a conclusion about the species composition of the bumblebee fauna, most of all – on the territory of Western Ukraine. The species diversity and their distribution are consistent with literature data.

On the basis of this inventory a catalogue should be published in the nearest future.

*We express the deepest thanks to I.B. Konovalova for the help with identification of bumblebees.*

REFERENCES

1. Catalogue of the freshwater mollusc collection of Prof. V.I. Zdun in the Zoological Museum of LNU. Compiled by: Shydlovskyy I.V., Hural R.I., Romanova Ch.J. Lviv: Publishing Center of Ivan Franko National University of Lviv, 2008. 58 p. BБК 594.38 (477) (In Ukrainian) // [Каталог колекції прісноводних молюсків проф. В. І. Здуна у фондах Зоологічного музею ЛНУ ім. І. Франка. Укладачі: Шидловський І.В., Гураль Р.І., Романова Х.Й. Львів: Видавничий центр ЛНУ ім. І. Франка, 2008. 58 с. ББК 594.38 (477)].
2. European Red List of Bees Access mode: [http://ec.europa.eu/environment/nature/conservation/species/redlist/downloads/European\\_bees.pdf](http://ec.europa.eu/environment/nature/conservation/species/redlist/downloads/European_bees.pdf).
3. Homopteran insects from the collection of E.-F. Germar in the Zoological Museum of LNU (Catalogue). Compiled by: Shydlovskyy I.V., Holovachov O.V. Lviv: Publishing Center of Ivan Franko National University of Lviv, 2005. 87 p. UDC 591.
4. *Konovalova I. B.* The bumble bees of Ukraine: species distribution and floral preferences // Psyche: Hindawi Publishing Corporation. 2010. Vol. 2010. Article ID 819740. 10 P. – doi: 10.1155/2010/819740
5. *Løken A.* Studies on Scandinavian Bumble Bees (Hymenoptera, Apidae) // Norsk Entomologisk Tidsskrift. 1973. N 20. P. 1–218.
6. *Løken A.* Scandinavian species of the genus *Psithyrus* Lepeletier (Hymenoptera: Apidae) // Entomologica scandinavica. 1984. Supplement № 20. P. 1–25
7. Red Data Book of Ukraine. Animals / Ed. by I. A. Akimov. Kyiv: Globalconsalting, 2009. 600 p. ISBN 978-966-97059-0-7 (In Ukrainian) // [Червона книга України. Тваринний світ / за ред. І. А. Акімова. К.: Глобалконсалтинг, 2009. 600 с. ISBN 978-966-97059-0-7].
8. The IUCN Red List of Threatened Species Access mode: <http://www.iucnredlist.org/>.
9. *Williams P. H.* An annotated checklist of bumble bees with an analysis of patterns of description (Hymenoptera: Apidae, Bombini) // Bull. Nat. Hist. Mus. Lond. (Entomol.). 1998. N 67. P. 79–152.
10. *Williams P. H., Cameron S. A., Hines H. M.* et al. A simplified subgeneric classification of the bumblebees (genus *Bombus*) // Apidologie. 2008. N 39. P. 46–74.
11. *Zagorodniuk I., Shydlovskyy I.* Acronyms for zoological collections of Ukraine // Zoological Collections and Museums (Collection of scientific articles) / Ed. by I. Zagorodniuk; National Museum of Natural History, Ukr. Acad. Sci. Kyiv, 2014. P. 33–34. (In Ukrainian) // [Загороднюк І., Шидловський І. Акроніми зоологічних колекцій України // Зоологічні колекції та музеї : збірник наук. праць / за ред. І. Загороднюка; Національний науково-природничий музей НАН України. К., 2014. С. 33–34].

*Стаття: надійшла до редакції 18.09.17*

*прийнята до друку 24.10.17*

**КОЛЕКЦІЯ ДЖМЕЛІВ (HYMENOPTERA, APIDAE,  
BOMBUS LATREILLE, 1802) У ФОНДАХ ЗООЛОГІЧНОГО МУЗЕЮ  
ЛЬВІВСЬКОГО НАЦІОНАЛЬНОГО УНІВЕРСИТЕТУ ІМЕНІ ІВАНА ФРАНКА**

**I. Тимків, I. Шидловський, К. Назарук, А. Затушевський**

*Львівський національний університет імені Івана Франка  
вул. Грушевського, 4, Львів 79005, Україна  
e-mail: irynatymkiv93@gmail.com*

У публікації подано кількісний і якісний аналізи колекції джмелів роду *Bombus*, котрі зберігаються у фондах Зоологічного музею Львівського національного університету імені Івана Франка. Колекція налічує 719 зразків, які належать до 23 видів. Більшість видів було зібрано в основному на території Західної України (на території восьми областей), кілька зразків зібрано з Німеччини (1960) та Єгипту (2005). На жаль, є невелика частина зразків без вказаного місця збору на етикетці. Основу зборів становлять види – звичайні та поширені на цій території, невелику частку становлять рідкісні та вразливі види (*Bombus argillaceus* і *B. muscorum*). Зразки у колекції зібрані в період 1960–2017 рр, більшість зборів припадає на останні п'ять років. Аналіз цієї колекції показує нам видовий склад фауни джмелів на території Західної України та деяких інших регіонів України. Інвентаризація стане основою для каталогу.

*Ключові слова:* джмелі, *Bombus*, Apidae, колекції, Зоологічний музей