

POLSKA AKADEMIA NAUK  
INSTYTUT ZOOLOGICZNY, ODDZIAŁ W KRAKOWIE

A C T A   Z   O   O   L   O   G   I   C   A  
C R A C C O V I E N S I A

Tom II

Kraków, 15 XI 1957

Nr 12

---

MIROSŁAWA DYLEWSKA

Zarys rozsiedlenia gatunków z rodzaju *Bombus* LATR. na obszarze Polski

Очерк расселения видов рода *Bombus* LATR. на территории Польши

The distribution of the species of genus *Bombus* LATR. in Poland  
(An outline)

[With 3 maps]

INTRODUCTION

Informations on the distribution of the species of genus *Bombus* LATR. in Poland date from the past century already; they appeared in publications on the *Apidae* or in papers discussing broader systematical units of the *Hymenoptera*. Most data on bumble-bees are found in papers pertaining to the entomofauna of the Polish lake-lands (Pomerania and Prussia), Lower Silesia, and the Sudetian and Tatry Mountains (J. ALFKEN, 1909, 1912; P. BLÜTHGEN, 1919; R. DITTRICH, 1903; J. NOSKIEWICZ, 1920; and others). The remaining parts of Poland were not investigated in detail by Polish entomologists (A. WIERZEJSKI, 1868, 1874; J. ŚNIEŻEK, 1894, 1910; K. DROGOSZEWSKI, 1932; J. SZULCZEWSKI, 1948) and therefore their results do not reproduce an image of the Polish bumble-bee fauna. There are no data on the distribution of bumble-bees on the Silesian Upland, the Lu-

blin Upland, the Roztocze Hills (distr. Lublin), as well as the Pieniny and Bieszczady Mountains (in the Carpathians). In the Zoological Institute of the Polish Academy of Science in Warszawa and Kraków there are collections of bumble-bees from the surroundings of Lower Silesia (leg. NIESIOLOWSKI), Krzyżanowice (county Pińczów, distr. Kielce; leg. GOLIAN and PISARSKI), from the environs of Warszawa (leg. ŚWIDERSKI), Raba Wyżna (county Nowy Targ) and Mt. Babia Góra (county Sucha in the Carpathians, coll. STOBIECKI), Kraków (leg. JELSKI), from the Roztocze Hills and the Tatry Mts. (leg. FUDAKOWSKI), from the Tatry Mts. (leg. R. WOJTUSIAK), from the Tatry Mts., environs of Kraków, and from Białowieża forest, collected by myself; however, these collections are rather fragmentary and do not form a complete image of the bumble-bee fauna of these areas.

The present paper is thus only my attempt to sum up the existing information on the distribution of the bumble-bees in Poland, to compile a detailed list of the species of genus *Bombus* LATR., as well as to give oecological and zoogeographical characteristics of this group of insects, and to regionalise it.

I wish to express my warm thanks to Professor J. STACH (who celebrates his scientific jubilee), and also to Professor J. NOSKIEWICZ and Professor J. FUDAKOWSKI for their help kindly shown to me during my work on the present paper.

#### EXISTING INVESTIGATIONS ON THE FAUNA OF THE BUMBLE-BEES (*BOMBUS* LATR.) IN POLAND

Accurate investigations on the bumble-bee fauna were made in the Polish lake-land districts (Pommerania and Prussia). The first papers, pertaining to the Hel Peninsula and the environs of Toruń, were published by C. BRIESCHKE (1888, 1899). Materials were collected in 1903 by W. ALBIEN (1905) in the region of Toruń, as well as by P. SPEISER (1906, 1908) in the counties: Puck, Gdańsk, Mrągowo, Reszel, Gołdap, Olecko, and Szczytno. The seashore was investigated by G. ENDERLEIN (1908) in the counties Puck and Słupsk.

All these papers were critically reviewed by J. ALFKEN

(1909, 1912, 1912). To the results of his research on the Apid fauna of Eastern and Western Prussia (counties: Kościerzyna, Kwidzyń, Chełm, Gołdap, Olsztyn, Giżycko, and Szczycyno) he added data taken from earlier publications of other authors, as well as from the collections of E. HASS (Gdańsk), STEINER (counties: Pasłęk, Mrągowo), VOGEL (counties: Bartoszyce, Gołdap, Olsztyn, Reszel, Mrągowo, and Kwidzyń), and SELLNICK (counties: Pasłęk, Węgorzewo, and Reszel).

Moreover, K. SCHIRMER's paper (1911) on the Hymenopteran fauna of Province Brandenburg should be mentioned, as a part of this province is included into Polish territory. Unfortunately this author does not name the localities where he gathered his collections.

V. TORKA (1909, 1913) gives some information on the distribution of the bumble-bees in county Piła; P. TIMM's paper (1915) contains data on county Gdańsk; K. DROGO-SZEWSKI (1932) gives the localities where bumble-bees appear on the Hel Peninsula (county Puck); and MOESCHLER (1938) does the same for the counties: Olsztyn, Węgorzewo, and Szczycyno.

P. BLÜTHGEN (1919, 1942) published lists of the Apids from the Pomeranian lake-land, collected in the counties: Szczycyno, Koszalin, Sławno, Słupsk and Miastko.

The Great-Polish and Masovian-Podlasian lowlands possess as yet no such accurate faunistic descriptions as the mentioned lake-lands. Apids were collected in county Zielona Góra by R. DITTRICH (1903), by V. TORKA (1903, 1913) in counties: Międzyrzec, Gniezno, and Żnin, by K. DROGO-SZEWSKI (1932, 1937) in the environs of Włocławek, Warszawa, and Łowicz, and by J. SZULCZEWSKI (1948) near Poznań. In W. REINIG's paper (1937) there is a mention on the bumble-bees of Białowieża forest.

On the south-Polish uplands the Apids were investigated by A. WIERZEJSKI (1868, 1874) and J. ŚNIEŻEK (1894, 1910) in the environs of Kraków. Newer informations can be found in a paper by A. PONGRACZ (1915) on the distribution of bumble-bees on the Lublin Upland (county Chełm), and in the faunistic lists of K. DROGO-SZEWSKI (1932, 1937) from the district Kielce (Święty Krzyż in the Świętokrzyskie Mts., Opatów,

and Busko). Data pertaining the bumble-bees of the Trzebnica Hills (lower Silesia) are given by R. DITTRICH (1903).

The mountain areas are described much better as to their fauna than the Polish lowlands and uplands. In the Sudetian Mts. as well as the Sudetian foot-hills as far as Wrocław bumble-bees (*Bombus Latr.*) were collected by R. DITTRICH (1903, 1905) in the counties: Zgorzelec, Lubań, Lwówek, Jelenia Góra, Kamienna Góra, Wałbrzych, Kłodzko, Bystrzyca, Ząbkowice, Nysa, Prudnik, Głubczyce, Jawor, Świdnica, Strzelin, Opole, Legnica, Środa Śląska, and Wrocław. H. MARSCHLER (1927) and J. MAY (1948) wrote on bumble-bees (*Bombus Latr.*) collected in the Karkonosze Mts.; these authors gave not only a list of species, but also their highest vertical range of appearance.

Ample information on the bumble-bees of the Tatry Mts. is contained before all in a paper by J. NOSKIEWICZ (1920), moreover in papers by A. WIERZEJSKI (1868, 1874) and J. ŚNIEŻEK (1910). Especially the publication of J. NOSKIEWICZ is important, as it gives the vertical distribution of separate species.

In the papers quoted above there are no exact data pertaining to the Carpathian Mts. (Beskides). A. WIERZEJSKI and J. ŚNIEŻEK often confine themselves to statements like „the whole Galicia“ etc.

#### RESULTS OF INVESTIGATIONS ON THE DISTRIBUTION OF BUMBLE-BEES (*BOMBUS LATR.*) IN POLAND

1. *Bombus (Hortobombus) hortorum* L. (*B. hortorum* L.). Often found in forests, their borders as well as in shrubberies in all Poland. In the Tatry Mts. very rarely transgressing the limit of the Alpine zone (1600 m above sea-level). Distributed in all Europe and northern Asia as far as Mongolia. In the Alps reaching 2400 m above sea-level.

2. *B. (Hortobombus) ruderatus* F. (*B. hortorum* L. v. *ruderatus* F.). A rare species known from meadows, fields, and forest borders. Appears everywhere in Poland except the Tatry Mts. Distributed in all Europe and northern Asia.

3. *B. (Subterraneobombus) subterraneus* L. (*B. latreillellus*

K., *B. subterraneus* L.). Very rare, appearing on fields, meadows, and forest borders in all Poland. I found it in the Tatry Mts. at 2250 m above sea-level. Known from all Europe, northern Asia, Mongolia, and the Caucasus. In the Alps found at an altitude of 2000 m above sea-level.

4. *B. (Subterraneobombus) distinguendus* MOR. (*B. subterraneus* L. v. *distinguendus* MOR.). Rare, found in forest areas and their borders as well as in shrubberies in all Poland. In the Tatry Mts. collected by POKORNY (according to DALLA TORRE, 1882), after this not found farther than the Podhale (northern part of county Nowy Targ) by J. NOSKIEWICZ (1920) and in the collection of R. WOJTUSIAK. Distributed in all Europe and northern Asia. Quoted from the Alps at 500 m above sea-level.

5. *B. (Subterraneobombus) fragrans* PALL. PONGRACZ (1923) quotes it from Chełm (distr. Lublin). A typical inhabitant of steppes; distributed in Mongolia, Iran, Turkestan, central Asia, Asia Minor, and south-eastern Europe.

6. *B. (Pomobombus) pomorum* Pz. Inhabits meadows, fields, gardens, forests — everywhere in Poland. In the Tatry Mts. till now found only in the Regle zone (subalpine zone). Appears in all Europe, central Asia, and Siberia. Ascertained in the Alps at an altitude of 1800 m above sea-level.

7. *B. (Pomobombus) elegans* SEIDL. (*B. pomorum* var. *mesomelas* GERST., *B. mesomelas* GERST.). Inhabits dry and sunny mountain slopes. In Poland found in the Carpathians and on the Little-Polish Upland. J. NOSKIEWICZ (1920) quotes it from the Tatry Mts. below the Alpine zone limit. H. WOJTUSIAK collected it on Mt. Gubałówka near Zakopane, and T. STOBIECKI in Raba Wyżna (county Nowy Targ). According to K. DROGOSZEWSKI (1932) it appears in Opatów (distr. Kielce). Distributed in mountainous regions of central Europe. In the Alps it reaches 2500 m above sea-level.

8. *B. (Agrobombus) agrorum* F. A common inhabitant of forests and their borders as well as shrubberies in all Poland. More rare in the Tatry Mts., does not cross the Alpine zone limit. Known from all Europe as well as northern Asia as far as Kamtchatka. Reaching 2000 m above sea-level in the Alps.

9. *B. (Agrobombus) humilis* JLL. (*B. solstitialis* Pz., *B. variabilis* SCHMDK., *B. helferanus* SEIDL.). Appears in forests and shrubberies in all Poland, up to the feet of the Tatry Mts. J. NOSKIEWICZ (1920) quotes it from Palenica (near Zakopane). Distributed in all Europe and northern Asia, but rare. In the Alps it reaches 2000 m above sea-level.

10. *B. (Agrobombus) muscorum* F. (*B. cognatus* SCHMDK.). Known from the fields and meadows of nearly all Poland. Nor ascertained in the Carpathians or the Tatry Mts. Most frequent near the Baltic Sea, more rare in the other areas. Inhabits all Europe and northern Asia. In the Alps appearing up to 800 m above sea-level.

11. *B. (Agrobombus) laesus* MOR. (*B. moscaryi* KRIECH.). J. ŚNIEŻEK (1910) quoted it from Galicia. One male specimen from Kraków is in JELSKI's collection and some from Babia Góra (county Sucha) I found in STOBIECKI's collection. Moreover quoted by ALFKEN (1912) from Eastern Prussia from Mikołajki (county Mrągowo). Distributed in the steppes of Turkestan and south-eastern Europe.

12. *B. (Agrobombus) ruderarius* MÜLL. (*B. derhamellus* JLL., *B. rajellus* R.). Distributed on fields, meadows, and in gardens everywhere in Poland. In the Tatry Mts. not higher than the Alpine zone limit. Quoted from all Europe. In the Alps reaching 2200 m above sea-level.

13. *B. (Agrobombus) silvarum* L. (*B. silvarum* L. „rasse“ *silvarum* L.). Frequent in fields, meadows, gardens, and forests. Appears in all Poland. In the Tatry Mts. not above the Alpine zone limit (found only by WIERZEJSKI, 1874). Distributed in all Europe and northern Asia. In the Alps not above 1600 m above sea-level.

14. *B. (Agrobombus) equestris* F. (*B. arenicola* THOMS., *B. silvarum* L. „rasse“ *equestris* F.). Found in forests and their borders in all Poland, up to the feet of the Tatry Mts. Distributed in Europe and northern Asia. In the Alps reaching 1000 m above sea-level.

15. *B. (Agrobombus) schrenki* MOR. A taiga species. Quoted from Białowieża forest by REINIG (1937). Distributed in north-eastern Europe and Siberia.

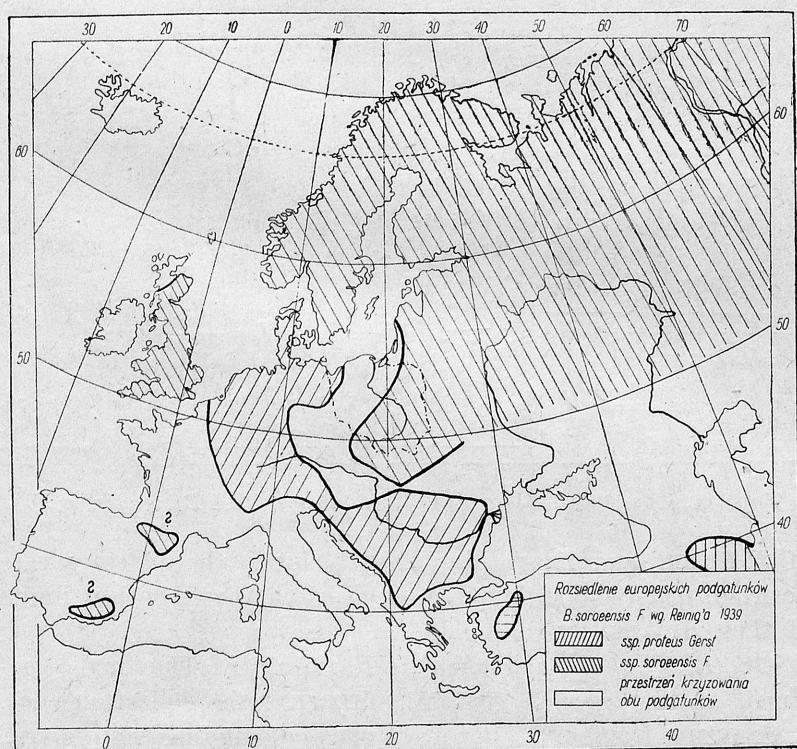
16. *B. (Confusibombus) confusus* SCHENCK. Very rare

species. Distributed in all Poland; not noted from the Tatry Mts. and Carpathians. Known from central Europe.

17. *B. (Lapidariobombus) lapidarius* L. Common in all Poland. Appears in forests, on fields, meadows, and in gardens. In the Tatry Mts. reaching the Alpine zone limit. Distributed in all Europe. In the Alps up to 2000 m above sea-level.

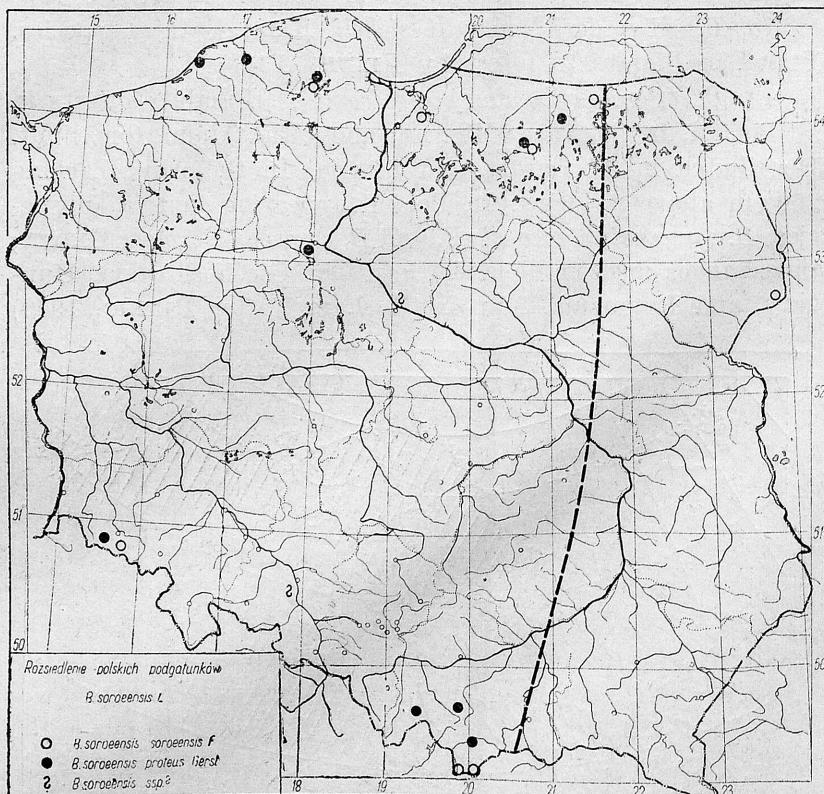
18. *B. (Lapidariobombus) sicheli* RAD. A taiga species. Found in Białowieża forest by REINIG (1937).

19. *B. (Soroeensibombus) soroeensis* F. Inhabits forests in all Poland. In the Tatry Mts. not above the Alpine zone limit. Distributed in all Europe and Siberia. In the Alps reaching 2600 m above sea-level. In Poland appearing in two subspecies: *B. soroeensis soroeensis* F. and *B. soroeensis proteus* GERST.; their ranges meet in Poland, Germany, Czechoslovakia, Hungary, and Roumania. Map No. I shows (after REINIG, 1939)



Map. I. The distribution of European subspecies of *B. soroeensis* F. after REINIG. The territory of appearance of both subspecies is marked white.

the areas inhabited separately by both these subspecies and the border area where they both appear. The course of the distribution limits of the said subspecies given by REINIG (1939) in Poland does not accord with the data taken from publications quoted above as well as data from the collections



Map. II. The distribution of Polish subspecies of *B. soroeensis* F.

of J. STACH and mine. Map No. 2 shows the places where both subspecies were found, as well as the hypothetical limits of their distribution in Poland.

20. *B. (Cullumanobombus) cullumanus* K. One male specimen of this species is in A. WIERZEJSKI'S collection (det. J. ŚNIEŻEK, controlled by me), place of finding not given. J. ŚNIEŻEK supposes that the specimen was caught in Galicia. Appears in north-western Europe

21. *B. (Pratobombus) jonellus* K. (*B. pratorum* L. v. *jonellus* K.). Known from the Tatry Mts. as well as the Polish lake-lands (Pommerania and Prussia). In the Tatry Mts. not above the Alpine zone limit. Very rare. Appears in the mountains of central Europe and in northern Europe. In the Alps noted up to 1700 m above sea-level.

22. *B. (Pratobombus) pyrenaeus* PÉR. Common in the Alpine zone in the Tatry Mts., reaching the highest summits. Known also from the subalpine zone as well as the Tatran foot-hills (Gubałówka, leg. H. WOJTUSIAK). Distributed in the mountains of Europe. In the Alps noted up to 2700 m above sea-level.

23. *B. (Pratobombus) pratorum* L. Common in the forests of all Poland. In the Tatry Mts. common even in the Alpine zone. Distributed in all Europe and northern Asia, in the Alps reaching 2500 m above sea-level.

24. *B. (Pratobombus) hypnorum* L. Ascertained in forest areas of the lake-lands and Poznań, Łowicz, Konstancin (county Warszawa, det. DYLEWSKA). In Gółąb (county Dęblin) and in Wrocław ascertained by J. NOSKIEWICZ, in Skarżysko by K. DROGOSZEWSKI (card index of the collection), in Kraków by A. WIERZEJSKI and J. FUDAKOWSKI (det. DYLEWSKA), in Krasnobród (leg. J. FUDAKOWSKI, det. DYLEWSKA), in Raba Wyżna (county Nowy Targ) and on Mt. Gubałówka (near Zakopane). See Map No. 3. Rare. Quoted from boreal regions as well as from the mountains of central Europe. It spread in central Europe in the past century (REINIG, 1920) and even reached the town parks. In the Alps reaching 2500 m above sea-level.

25. *B. (Terrestribombus) terrestris* L. (*B. terrestris* L.). Common on the fields, meadows, in gardens, and forests of all Poland. Very frequent in the Tatry Mts., transgressing the Alpine zone limit. Distributed in northern Europe and Asia Minor. In the Alps — according to PITTONI — it reaches 1500 m above sea-level; again, DALLA TORRE (1882) quoted it from 2550 m above sea-level.

26. *B. (Terrestribombus) lucorum* L. (*B. terrestris* L. v. *lucorum* L.). More rare than the preceding species, appears everywhere in Poland. In the Tatry Mts. also found above the

Alpine zone limit. Quoted from Europe and northern Asia. In the Alps found up to 2600 m above sea-level.

27. *B. (Alpigenobombus) mastrucatus* GERST. Frequent in mountain forests in the Sudetian and Tatry Mts. More rare in the Podhale. In the Tatry Mts. transgressing the Alpine zone limit. Appearing in the mountains of Europe, the Caucasus, in Lapponia, and Norway.

OECOLOGICAL ELEMENTS OF THE FAUNA OF BUMBLE-BEES  
(*BOMBUS LATR.*) of POLAND

The bumble-bees have been called „biotope indices“ because — basing on separate species appearing in an area — one may determine the environment inhabited by them. B. PITTIONI (1942) discerned six types of distribution of the bumble-bees considering known facts on their specific range:

- (1) typically steppe (stenotypical-eremophilous), chiefly comprising representants of the xero- and thermophilous fauna;
- (2) steppe-forestal (eurytopical-eremophilous); the bumble-bees belonging to this type of distribution inhabit wooded steppe areas and dry mountain meadows;
- (3) steppe and forestal (hypereurytopical-intermediate), comprising forms distributed on fields, meadows, in gardens, and forests, in lowlands and in mountains, except high mountain regions;
- (4) forestal-steppe (eurytopical-hylophilous); here are forms appearing in forests and on their borders, in shrubberies, on fields and meadows neighbouring with forest areas in lowlands and in the mountains;
- (5) typically forestal (stenotypical-hylophilous), comprises species exclusively inhabiting forests;
- (6) typically mountainous (stenotypical-orophilous) with representants appearing on sunny mountain slopes.

The types of distribution enumerated above comprise the following species of bumble-bees belonging to the Polish fauna: (Table I).

The assignment of the species of bumble-bees to the separate types of distribution was based on PITTIONI'S division.

Table I

Name	Eremophilous		Hypereurytopical	Hylophilous		Stenotypical orophilous
	steno-typical	eu- ry- topi- cal		steno-typical	eu- ry- topi- cal	
<i>B. hortorum</i> L.	—	—	—	—	+	—
<i>B. ruderatus</i> F.	—	+	—	—	—	—
<i>B. subterraneus</i> L.	—	+	—	—	—	—
<i>B. distinguendus</i> MOR.	—	—	—	—	+	—
<i>B. fragrans</i> PALL.	+	—	—	—	—	—
<i>B. pomorum</i> Pz.	—	—	+	—	—	—
<i>B. elegans</i> SEIDL.	—	—	—	—	—	+
<i>B. agrorum</i> F.	—	—	—	—	+	—
<i>B. humilis</i> JLL.	—	—	—	—	+	—
<i>B. muscorum</i> F.	—	+	—	—	—	—
<i>B. laesus</i> MOR.	+	—	—	—	—	—
<i>B. ruderarius</i> MÜLL.	—	—	—	—	+	—
<i>B. silvarum</i> L.	—	—	+	—	—	—
<i>B. equestris</i> F.	+	—	—	—	—	—
<i>B. schrenki</i> MOR.	—	—	—	+	—	—
<i>B. confusus</i> SCHENCK	—	—	+	—	—	—
<i>B. lapidarius</i> L.	—	—	+	—	—	—
<i>B. sicheli</i> RAD.	—	—	—	+	—	—
<i>B. soroeensis</i> F.	—	—	—	+	—	—
<i>B. cullumanus</i> K.	—	—	—	—	—	—
<i>B. jonellus</i> K.	—	—	—	+	—	—
<i>B. pyrenaeus</i> PÉR.	—	—	—	—	—	+
<i>B. pratorum</i> L.	—	—	—	+	—	—
<i>B. hypnorum</i> L.	—	—	—	+	—	—
<i>B. terrestris</i> L.	—	—	+	—	—	—
<i>B. lucorum</i> L.	—	+	—	—	—	—
<i>B. masstrucatus</i> GERST.	—	—	—	+	—	—

The only exception is *B. terrestris* L. which was included into the hypereurytopical-intermediate type of distribution (not into the eurytopical-eremophilous one, as by PITTONI, 1942), since *B. terrestris* L. appears on fields, meadows, in gardens and forests as well as on typical steppe areas.

It results from Table I that most bumble-bees in Poland belong to forest species. They comprise about 54% of all Polish species of bumble-bees. As the species of the hypereury-

topical distribution type also inhabit forests, it may be ascertained that the Polish bumble-bees are forest bumble-bees before all, while comparatively little of them belong to typical forest species (and among the latter only *B. pratorum* L. is frequent). It should be stressed that forests occupy only 21,6% of the area of Poland. Thus, there is a visible disproportion between this figure and the percentage of forest species of bumble-bees in Poland. Probably there was no such disproportion in earlier times, when Poland was nearly completely covered by forests. The forest bumble-bees could keep their ground in Poland, as they can live also in areas neighbouring with forests.

Only one typical steppe bumble-bee is represented in Poland, i. e. *B. laesus* MOR.

Similarly there are very little mountain species in Poland, namely: *B. elegans* SEIDL, *B. mastrucatus* GERST. and *B. pyrenaeus* PÉR. The former appears in the Carpathians and does not reach the Alpine zone in the Tatry Mts., the latter is the most common representant of the *Hymenoptera* in the Alpine zone of the Tatry Mts.

#### ZOOGEOGRAPHICAL ELEMENTS OF THE POLISH BUMBLE-BEE FAUNA

Below (in Table II) the Polish bumble-bee species are listed as belonging to the following types of zoogeographical distribution:

- 1) Palaearctic type, with species distributed in all Palaearctis;
- (2) European-Siberian type, comprising species inhabiting all Europe and norther Asia;
- (3) Pontic type, where the forms of the Turkestan steppes and those of south-eastern Europe belong;
- (4) mountain type, comprising forms distributed in the mountains of Europe;
- (5) European type, with species distributed in all Europe;
- (6) central-European type, with representants inhabiting central Europe;
- (7) European-Mediterranean type, to which belong the bumble-bees distributed in all Europe and northern Africa;
- (8) boreal-European-Siberian type, with north-eastern European as well as Siberian forms.

In the papers published till now (PITTIONI, 1940; KNECHTEL, 1955) it was maintained that *B. hypnorum* L. is a boreal-Alpine

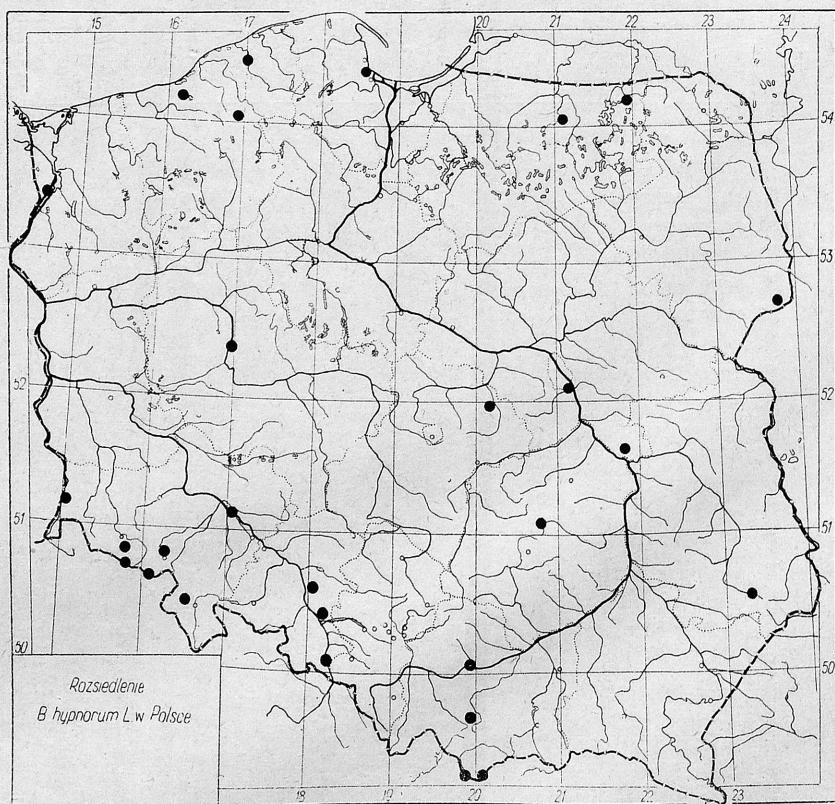
Table II

Name	Palaearctic	European-Siberian	Pontic	montanic	European	centr. European	European-Mediterran.	boreal-European-Siberian
<i>B. hortorum</i> L.	+	+	+	+	+	+	+	+
<i>B. ruderatus</i> F.	+	+	+	+	+	+	+	+
<i>B. subterraneus</i> L.	+	+	+	+	+	+	+	+
<i>B. distinguendus</i> MOR.	+	+	+	+	+	+	+	+
<i>B. fragrans</i> PALL.	+	+	+	+	+	+	+	+
<i>B. pomorum</i> Pz.	+	+	+	+	+	+	+	+
<i>B. elegans</i> SEIDL.	+	+	+	+	+	+	+	+
<i>B. agrorum</i> F.	+	+	+	+	+	+	+	+
<i>B. humilis</i> JLL.	+	+	+	+	+	+	+	+
<i>B. muscorum</i> F.	+	+	+	+	+	+	+	+
<i>B. laesus</i> MOR.	+	+	+	+	+	+	+	+
<i>B. ruderarius</i> MÜLL.	+	+	+	+	+	+	+	+
<i>B. silvarum</i> L.	+	+	+	+	+	+	+	+
<i>B. equestris</i> F.	+	+	+	+	+	+	+	+
<i>B. schrenki</i> MOR.	+	+	+	+	+	+	+	+
<i>B. confusus</i> SCHENCK.	+	+	+	+	+	+	+	+
<i>B. lapidarius</i> L.	+	+	+	+	+	+	+	+
<i>B. sicheli</i> RAD.	+	+	+	+	+	+	+	+
<i>B. soroeensis</i> F.	+	+	+	+	+	+	+	+
<i>B. cullumanus</i> K.	+	+	+	+	+	+	+	+
<i>B. jonellus</i> K.	+	+	+	+	+	+	+	+
<i>B. pyrenaeus</i> PÉR.	+	+	+	+	+	+	+	+
<i>B. pratorum</i> L.	+	+	+	+	+	+	+	+
<i>B. hypnorum</i> L.	+	+	+	+	+	+	+	+
<i>B. terrestris</i> L.	+	+	+	+	+	+	+	+
<i>B. lucorum</i> L.	+	+	+	+	+	+	+	+
<i>B. mastrucatus</i> GERST.	+	+	+	+	+	+	+	+

species. Considering the distribution of this species in Poland (see map No. III) as well as the data of REINIG (1920) and HOLDHAUS (1954) it should be taken as an European-Siberian element.

It results from Table II that over 50% of the bumble-bee species appearing in Poland belong to the European-Siberian type of distribution. If we add to this group of bumble-bees the Palaearctic, European, central-European, and European-Mediterranean species, i. e. all these which inhabit all or

nearly all Europe, there will remain only several species belonging to special types of zoogeographical distribution. They



Map III. The distribution of *Bombus hypnorum* L. in Poland

are mountain species, as well as the boreal-European-Siberian, and Pontic bumble-bees, forming in all 26% of all the Polish bumble-bee species.

The scantiness of mountain species in Poland is striking when compared with the number of mountain species distributed in the Alps and Balkans.

Many steppe species of bumble-bees distributed in southern and eastern Europe are also absent from Poland. The ranges of these species end in Podolia and the southern half of the Tatry Mts.

AN ESSAY OF FAUNISTIC REGIONALISATION  
OF THE BUMBLE-BEE IN POLAND

The surface of Poland may be divided into five geographical regions extended parallelly, namely:

(1) the lake-lands in the north, (2) the lowlands of central Poland, (3) the uplands of southern Poland, (4) the Sudetian Mts. and Carpathians, and (5) the Tatry Mts.

In Table III given below there is a systematical list of Polish bumble-bees. In the columns their appearance in the different geographical regions is shown.

Table III

Name	Lake-lands	Lowlands	Upplands	Sudetians & Carpathians	Tatry Mts.
<i>B. hortorum</i> L.					
<i>B. ruderatus</i> F.					
<i>B. subterraneus</i> L.					
<i>B. distinguendus</i> MOR.					
<i>B. fragrans</i> PALL.					
<i>B. pomorum</i> Pz.					
<i>B. elegans</i> SEIDL.					
<i>B. agrorum</i> F.					
<i>B. humilis</i> JLL.					
<i>B. muscorum</i> F.					
<i>B. laesus</i> MOR.					
<i>B. ruderarius</i> MÜLL.					
<i>B. silvarum</i> L.					
<i>B. equestris</i> F.					
<i>B. schrenki</i> MOR.					
<i>B. confusus</i> SCHENCK					
<i>B. lapidarius</i> L.					
<i>B. sicheli</i> RAD.					
<i>B. soroeensis</i> F.					
<i>B. cullumanus</i> K.					
<i>B. jonellus</i> K.					
<i>B. pyrenaeus</i> PÉR.					
<i>B. pratorum</i> L.					
<i>B. hypnorum</i> L.					
<i>B. terrestris</i> L.					
<i>B. lucorum</i> L.					
<i>B. mastrucatus</i> GERST.					

It may be seen in the table that 13 species of bumble-bees inhabit all the area of Poland, the Tatry Mts included. Moreover, 3 species are distributed in all Poland, excluding the Tatry Mts and 1 species (*B. jonellus* K.) noted only in Lake-lands and in Tatry Mts. The said 17 species are distributed in all Europe chiefly in forests. Also all four species known in Poland with a steppe and forestal type of distribution belong here, as well as four steppe-forestal species. All these together form 63% of the bumble-bee species known from Poland. The rest is composed of four mountain species (11%) and seven other species (26%). This last group is formed by boreal-European-Siberian, steppe, and lowland (*B. muscorum* F.) species, distributed in Europe up to 500 m above sea-level.

#### BIBLIOGRAPHY

- ALBIEN W. 1905. Sammelbericht über meine im Sommer 1903 ausgeführte Exkursion in die Kreise Thorn und Briesen. Ber. Westpr. Bot.-Zool. Ver. Danzig **26**, pp. 13—25.
- ALFKEN J. D. 1909. Beitrag zur Kenntnis der Apidenfauna von Ostpreussen. Schrift. Phys.-ökonom. Ges. Königsberg **50**, pp. 320—345.
- ALFKEN J. D. 1912. Die Bienenfauna von Ostpreussen. Schrift. Phys.-ökonom. Ges. Königsberg **53**, pp. 114—182.
- ALFKEN J. D. 1912. Die Bienenfauna von Westpreussen. Ber. Westpr. Bot.-Zool. Ver. Danzig **34**, pp. 1—96.
- BENOIST M. R. 1928. Les Hyménoptères mellifères des Alpes. Mém. Soc. Biogeogr. Paris **6**, pp. 81—85.
- BISCHOFF H. 1925. Beiträge zur Natur-und Kulturgeschichte Lithauens und angrenzender Gebiete. *Hymenoptera*. Abh. math.-naturw. Ab. Bayer. Ak. Wiss. München, Suppl. 7 Abhandlung pp. 278—337.
- BLÜTHGEN P. 1919. Die Bienenfauna Pommerns. Stett. Ent. Zeit. Stettin **80**, pp. 65—131.
- BLÜTHGEN P. 1942. Die Bienenfauna Pommerns. Stett. Ent. Zeit. Stettin **103**, pp. 81—91.
- BRIESCHKE C. S. A. 1888. Bericht über eine Exkursion nach Hela während des Juli 1887. Schrift. Naturforsch. Ges. Danzig, 7, pp. 42—64.
- BRIESCHKE C. S. A. 1888. *Hymenoptera aculeata* der Provinzen West- und Ostpreussen. Schrift. Naturforsch. Ges. Danzig, 7 pp. 85—106.
- BRIESCHKE C. A. 1889. Bericht über eine Exkursion nach Steegen und frieschen Nehrung in Juli 1888. Schrift. Naturforsch. Ges. Danzig, 7, pp. 193—209.
- DALLA TORRE K. W. 1878. Beitrag zur Kenntnisse der Hymenopterenfauna Tirols. Natuwiss. Ab. Innsbruck **2**, pp. 251—280.

- DITTRICH R. 1903. Verzeichnis der bisher in Schlesien aufgefundenen Hymenopteren I. *Apidae*. Zeitschr. Ent. Breslau, **28**, pp. 19—54.
- DROGOSZEWSKI K. 1932. Wykaz żądłówek zebranych w Polsce środkowej. Polsk. Pism. Ent., Lwów **11**, pp. 113—118.
- DUCKE A. 1898. Die Bienenfauna Österreich-Schlesiens. Ent. Nachricht. Berlin, **24**, pp. 129—146.
- ENDERLEIN G. 1908. Biologisch-faunistische Moor- und Dünenstudien. Ber. Westpr. Bot.-Zool. Ver. Danzig, **30**, pp. 53—238.
- FUDAKOWSKI J., NIESIŁOWSKI W., SAGAN, WOJTUSIAK R., ZABŁOCKI J. 1938. Drugi przyczynek do znajomości fauny Czarnohory. Inst. Bad. Leś. Państw. Warszawa, Ser. A, **42**, pp.
- HOLDHAUS C. 1954. Die Spuren der Eiszeit in der Tierwelt Europas. Abh. Zool.-Bot. Ges. Wien, **18**.
- KINEL J. & NOSKIEWICZ J. 1930. Einige Bemerkungen über die Zoogeographischen Verhältnisse von Podalien Anteils. Polsk. Pism. Ent. Lwów **9**, pp. 272—288.
- KLAPÁLEK F. 1902. Čmeláci zeme České. Archiv. Přírodověd. Prozkoumání Čech. Praga **5**, pp. 1—48.
- KNECHTEL W. K. 1955. Fauna Republicii populare Romine. *Insecta. Hymenoptera. Subfamilia Apinae*. **9**, fasc. I, pp. 1—111.
- KUNTZE R. & NOSKIEWICZ J. 1938. Zarys zoogeografii Polskiego Podola. Lwów.
- 1925. Einige Bemerkungen zu der Arbeit von Dr. PONGRACZ: Beiträge zur Tiergeographie Polens. Archiv. Naturges. Berlin, **91**, Ab. A. pp. 110—121.
- MACKO S. & NOSKIEWICZ J. 1954. Stanowisko rozchodnika białego (*Sedum album*) na Górze Wapiennej kolo Stolca pod Ząbkowicami. Próba charakterystyki florystycznej i faunistycznej. Ochrona Przyrody. Kraków, **22**, pp. 167—197.
- MARSCHNER H. 1927. Über die Hummeln des Riesengebierge. Soc. Ent. Stuttgart, **42**, pp. 33—34.
- MAY J. 1948. Bionomie rodu *Bombus LATR.* a *Psithyrus* LEP. (IV) Čmeláci v Krkonoších. Čas. Čs. Spol. Ent. Praga, **45**, pp. 146—155.
- MÖSCHLER A. 1938. Ein Beitrag zur Bienenfauna in Ostpreussen insbesondere der Kurischen Nehrung. Schrift. Phys.-ökonom. Ges. Königsberg, **70**, pp. 243—288.
- MOCSARY A. 1918. Fauna Regni Hungariae. Budapest.
- NOSKIEWICZ J. 1920. Przyyczynek do znajomości fauny żądłówek Tatr Polskich. Kosmos. Lwów **45**, pp. 145—162.
- PAX F. 1921. Die Tierwelt Schlesiens. Jena.
- PITTIONI B. 1938. Die Hummeln und Schmarotzerhummeln der Balkan-Halbinsel mit besonderer Berücksichtigung der Fauna Bulgariens I. Allgemeiner Teil. Mitt. Königl. Naturwiss. Inst. Sofia, **11**, pp. 12—69.
- PITTIONI B. 1939. Die Hummeln und Schmarotzerhummeln der Balkan-Halbinsel mit besonderer Berücksichtigung der Fauna Bulgariens II. Spezieller Teil. Mitt. Königl. Naturwiss. Inst. Sofia, **12**, pp. 49—114.
- PITTIONI B. 1940. Die Hummeln und Schmarotzerhummeln von Venezia

- Tridentina 2. Beitrag zur zoogeographischen Erforschung der Ostalpen und zur Ökologie der Gattungen *Bombus* und *Psithyrus*. Mem. Mus. Stor. Natur. Venezia Tridentina, Trento, **5**, fasc. 1, pp. 1—43.
- PITTIONI B. 1942. Die borealalpinen Hummeln und Schmarotzerhummeln. (*Hymen.*, *Apidae*, *Bombinae*) Teil. I. Mitt. Königl. Naturwiss. Inst. Sofia., **15**, pp. 155—218.
- PITTIONI B. & SCHMIED R. 1942. Die Bienen des südöstlichen Niederdonau I. *Apidae*, *Podaliridae*, *Xylocopidae* und *Ceratinidae*. Niederdonau Natur u. Kultur. Wien-Leipzig, **19**, pp. 3—69.
- REINIG W. F. 1937. Die Holarktis. Jena.
- SCHIRMER K. 1911. Beiträge zur Kenntnis der Hymenopterenfauna der Provinz Brandenburg. Br. Ent. Zeitschr. Berlin, **56**, pp. 153—171.
- SLAVIČEK J. 1901. Rozbor čmeláků a počmelaků (*Bombus*, *Psithyrus*) českomoravských s poznamkami biologickými. Vest. Klub. Prirodoved. Prostějovské, **4**, pp. 83—106.
- ŚNIEŻEK J. 1910. Błonkówki pszczołowate (*Apidae*), zebrane w Galicji. Spr. Kom. Fizj. Kraków, **44**, pp. 31—46.
- SPEISER P. 1906. Über eine Sammelreise im Kreise Oletzko. Schrift. Phys.-ökonom. Ges. Königsberg, **47**, pp. 71—78.
- SPEISER P. 1906. Einige seltene Hymenopteren der ost- und westpreussischen Fauna. Schrift. Phys.-ökonom. Ges. Königsberg, **47**, pp. 170—173.
- SZULCZEWSKI J. W. 1948. Błonkówki (*Hymenoptera*) Wielkopolskiego Parku Narodowego. Prace Monogr. Przyr. Parku Narod. Poznań, **2**, pp. 69—90.
- TIMM P. 1915. Einige bemerkenswerte Insektenfunde aus der Kreise Neustadt. Ber. Westpr. Bot.-Zool. Ver. Danzig, **37**, pp. 345—351.
- TORKA V. 1913. Die Bienen der Provinz Posen. Zeitschr. Naturwiss. Abt. Posen, **20**, pp. 97—181.
- TORKA V. 1927. Zur Bienenfauna Oberschlesiens. Intern. Ent. Zeitschr., Guben, **20**, pp. 125—130.
- WIERZEJSKI A. 1868. Przyczynek do fauny bąlonkówek (*Hymenoptera*). Spr. Kom. Fizj. Kraków, **2**, pp. 108—120.
- WIERZEJSKI A. 1874. Dodatek do fauny bąlonkówek (*Hymenoptera*). Spr. Kom. Fizj. Kraków, **8**, pp. 253—273

#### STRESZCZENIE

W niniejszej pracy na podstawie dotychczasowych publikacji i zbiorów zebrano dane dotyczące rozsiedlenia rodzaju *Bombus* LATR. w Polsce i sporządzono wykaz 27 gatunków tego rodzaju, które zamieszkują obszar Polski.

Z tej liczby tylko 3 gatunki są pospolite w Polsce: *Bombus*

*agrorum* F., *B. lapidarius* L. i *B. terrestris* L., a 5 gatunków należy do często spotykanych: *B. hortorum* L., *B. muscorum* F., *B. ruderarius* MÜLL. *B. silvarum* L. i *B. lucorum* L. Ponadto na obszarach górskich często występują *B. pyrenaeus* PER. i *B. mastrucatus* GERST.

Autorka wyróżnia w faunie trzmieli Polski jako elementy ekologiczne grupę eremofilną, obejmującą 8 gatunków, hyper-eurytopiczno-intermedialną, zamieszkującą tereny zarówno stepowe jak i leśne, 4 gatunki, hylofilną reprezentowaną przez 13 gatunków, oraz grupę orofilną tylko z dwoma gatunkami.

Pod względem zoogeograficznym najliczniej reprezentowany jest w faunie trzmieli Polski element europejsko-syberyjski (15 gatunków), mniej licznie elementy pontyjski, centralno-europejski, europejsko-medyteranejski i palearktyczny.

Z ogólnej liczby 27 gatunków trzmieli rozsiedlonych na obszarze Polski 13 gatunków zamieszkuje całą Polskę, 3 dochodzi tylko do stóp Tatr, a reszta występuje na terenach geograficznie zróżnicowanych (nizinne, górskie), lub ich zakresi kończą się przy granicach Polski (*B. fragrans* PALL., *B. sicheli* RAD., *B. schrenki* MOR.).

#### РЕЗЮМЕ

В настоящей статье, на основании существующей литературы и коллекций, собраны данные о расселении рода *Bombus* LATR. в Польше и составлен список, содержащий 27 видов этого рода живущих на территории Польши. Из этих 27 видов, только 3 вида обыкновенны в Польше, это: *Bombus agrorum* F., *B. lapidarius* L., и *B. terrestris* L. 5 видов принадлежат к числу часто встречающихся: *B. hortorum* L., *B. muscorum* F., *B. ruderarius* MÜLL., *B. silvarum* L. и *B. lucorum* L. Кроме того, в местностях гористых часто встречаются *B. pyrenaeus* PER. и *B. mastrucatus* GERST.

Автор разделяет шмелей, принадлежащих к фауне Польши на следующие группы: экологическую эремофильтную, заключающую 8 видов, гиперевритопически-интермедиальную, заключающую 4 вида и населяющую степные и лесные пространства, гилофильную, с 13 видами и орофильную, с двумя видами.

В зоогеографическом отношении, в фауне шмелей Польши наиболее распространенным является элемент европейско-сибирский (15 видов). Менее многочисленны элементы: pontийский, центральноевропейский, европейско-средиземноморский и палеарктический.

Из общего числа 27 видов шмелей, заселяющих территорию Польши, 13 видов распространены по всей Польше, 3 вида доходят только до подножия Татр, остальные встречаются в местностях географически дифференцированных (низменных, гористых, бореоальпийских) или границы их распространения кончаются у границ Польши (*B. fragrans* PALL., *B. sicheli* RAD., *B. schrenki* MOR.).

---

Redaktor zeszytu: prof. dr Jan Stach

---

Państwowe Wydawnictwo Naukowe — Oddział w Krakowie 1957

---

Nakład 960 + 100 egz. Ark. wyd. 1,25. — Ark. druk. 1 $\frac{1}{4}$ . Papier ilustr. kl. III 80 g 70 × 100.  
Zam. 396/57 Cena zł 10.—

---

Krakowska Drukarnia Naukowa