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Records of two bumble bee species new for the Czech Republic and Slovakia (Hymenoptera: Apoidea: Bombini)

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Abstract

New records of *Pyrobombus* (*Cullumanobombus*) *semenoviellus* (SKORIKOV, 1910) in Germany and the Czech Republic are given. Further, a new record is given for *Pyrobombus* (*Melanobombus*) *sicheli* (RADOSZKOWSKI, 1859) from the Czech-Slovak borderland. Thus, *P. semenoviellus* is a new species for the Bohemian part of the Czech Republic and *P. sicheli* is a new species for Slovakia and the Moravian part of the Czech Republic. The ecological implication of the spread of these taigas' species in Central Europe is discussed.

Zusammenfassung

Neue Meldungen des Vorkommens von *Pyrobombus* (*Cullumanobombus*) *semenoviellus* (SKORIKOV, 1910) in Deutschland und in der Tschechischen Republik, sowie von *Pyrobombus* (*Melanobombus*) *sicheli* (RADOSZKOWSKI, 1859) im tschechisch/slowakischen Grenzgebiet werden mitgeteilt. Somit stellt *P. semenoviellus* eine neue Art für die Tschechische Republik und *P. sicheli* eine neue Art für die Slowakei und zugleich auch für den mährischen Teil der Tschechischen Republik dar. Ökologische Aspekte des aktuellen Vordringens dieser zwei Taiga-Arten nach Mitteleuropa werden erörtert.

Introduction

New records of two bumble bee species from the Czech Republic have recently been reported (TKALCŮ, 1999); i.e., *Bombus cryptarum* (FABRICIUS, 1775) and *Megabombus* (*Thoracobombus*) *sidemii* (RADOSZKOWSKI, 1888). The records of *B. cryptarum* date back to 1958-1999, and are therefore relatively recent. By contrast, the records of *M. sidemii* are of more historical value (dating from the years 1910 and 1937). In spite of this, these records document the westernmost distribution of this otherwise "taiga" species.

Another taiga species, new for Finland, was recorded in 1965 (ELFING, 1965) – i.e., *Pyrobombus semenoviellus* (SKORIKOV, 1910). Recently, this species has been recorded in northern Germany (SMISSEN van der & RASMONT, 1999). These authors have reviewed the history of the distribution for this species in Europe, but record from Poland (PLEWKA, 1995) did not reviewed.

Pyrobombus sicheli (RADOSZKOWSKI, 1859) is another representative of the Siberian Taiga. The species is very broadly distributed in the Palaearctic Region (from the Pyrenees to Kamtchatka – terra typica). Since *P. sicheli* occurs also in isolated mountain areas, the species is variable in its colour pattern and consists of several subspecies (REINIG, 1935).

The aim of this communication is to provide information about new records from the Czech Republic and Slovakia for the latter two bumble bee species. Since these species are not usually included in identification keys, we have also given their main diagnostic characters.

Material and results

Pyrobombus (*Cullumanobombus*) *semenoviellus* (SKORIKOV, 1910)

Taxonomy and distribution

PANFILOV (1951) published a redescription of the species and figured the male genitalia. No subspecies are known for this species despite its wide distribution in the Palaearctic Region. Terra typica for the type series are as follows: Provinces Rjazan, Vladimir and Orenburg (all East-Southeast from Moscow). The distribution has been mapped by SMISSEN & RASMONT (1999: 23).

Identification

Female sex (♀ and ☿):

A similar colour pattern of body hair as in *P. semenoviellus* is present also in some species from Central Europe of the genera *Megabombus* and *Bombus*. However, the distal posterior portion of the mesobasitarus in *P. semenoviellus* differs from *Megabombus* species by the absence of the typical spine. The transverse ledge on the labrum in *P. semenoviellus* is markedly narrow by contrast to species in the genus *Bombus*.

Pyrobombus (*Pyrobombus*) *jonellus* (KIRBY, 1802) is the only species among all *Pyrobombus* in Europe that has a nearly identical colour pattern as that seen in *P. semenoviellus*; i.e., two yellow hair bands on the dorsal surface of the thorax, a yellow band on T1 and white hair on T4-T6. Only one difference in colouration is developed: the clypeus of *P. semenoviellus* ♀ and ☿ is covered by yellow hairs by contrast to black hairs in *P. jonellus* females. However, there are further supraspecific characters typical of *Cullumanobombus* species which can also be used for distinguishing those species of similar colouration.

Females of the subgenus *Cullumanobombus*:

The outer surface of metabasitarsus with great reduction of plumose hairs – frequently only with simple hairs, therefore this area is conspicuously shiny (Fig. 1a) – this character is not consistently developed in all *Cullumanobombus* species [e.g. *P.* (*C.*) *unicus* (MOR.)]. The malar area is distinctly shorter than wide (Fig. 2a). The supraorbital area of the vertex is roughly and densely punctate, spaces among punctures are narrower than the width of the punctures (Fig. 3a).

Females belonging to the subgenera *Pyrobombus* s.str. & *Melanobombus*:

The hairs on the outer surface of the metabasitarsus are distinctly plumose; this area is nearly gleamless (Fig. 1b). The malar area is quadrate or a little longer than wide (Fig. 2b). The punctation on the supraorbital area is distinctly finer and sparse (Fig. 3b).

Males of the subgenus *Cullumanobombus*:

The malar area is clearly shorter than wide (similar to females). Supraorbital area of the vertex is roughly and densely punctate, spaces among punctures are narrower than the width of the punctures (similar to females). Squama pointed, lacinia relatively long, distinctly surpassing the squama, apically oblique as in Fig. 4a.

Males belonging to the subgenera *Pyrobombus* s.str. & *Melanobombus*:

The malar area is quadrate or a little longer than wide (similar to females). The punctation on the supraorbital area is finer and sparse (similar to females). Genitalia differ in conformation of lacinia, squama and penis valve as indicated in the figures (Figs. 4b, 4c).

New records:

M a t e r i a l : Germany, Sachsen, OL, Baruth b. Bautzen, Schafberg, 21. vi. 2001, 1☿, lgt. and coll. Francke; Mark Brandenburg, Niederlausity, Umg. Siewisch, 22. vii. 1996, 1☿, leg. E. Kwast, coll. W.-H. Liebig; Czech Republic, Bohemia centr., NNR Stráně u Splavu, Vrbčany, faunistic squares 5955b-5956a, 50°03′37′′N 15°00′E (Fig. 6), 12. vii. 1999, 1☿, lgt. & coll. K. Holý; Bohemia sept., Kokořínsko (Protected Landscape Area), Korce-Korecký vrch (465 m), square 5453 (Fig. 6, gray squares), 50° 30' N, 14° 35' E, 21. 8. 2002, 1♂, lgt. D. Vepřek, coll. A. Přidal, det. A. Přidal & B. Tkalců.

Comments on the records: No details are known about these German records by contrast to the Czech records (see below). Bautzen is approximately 20 km from the northern boundary of the Czech Republic.

During the sampling trip only one extremely small ☿ with worn wings and raw body hair was captured by Mr Kamil Holý in the National Nature Reserve, "Stráně u splavu" (Fig. 6).

Another speciemen was collected in the northern part of Bohemia in Protected Landscape Area – Kokořínsko by Mr Dušan Vepřek; the specimen is of the male sex and in good condition. These specimens were identified among extensive material of the aforementioned collectors. The species is new for the Czech Republic – Bohemia part!

Comments on the locality: The natural reserve "Stráně u splavu" lies at an altitude 215-240 m above sea level and is 0,633 ha in area. This natural reserve is situated about 15 km from the town of Kolín and was proclaimed as a protected area in 1951. The habitat belongs to the subprovince of the Bohemia Table and is of deciduous forest. It is an area with warm and relatively dry climate. The average yearlong temperature is 9°-9.4° C and the sum of yearlong precipitations is 480-500 mm. The vegetation degree is No. 2 (beech-oak forest) without beech (*Fagus*) because of the specific substrate (CULEK et al., 1996). The major part of the Elbe valley territory is arable land.

The xerotherm character of the habitat is obvious by the presence of typically steppe plants as follows: *Stipa pulcherrima*, *Gagea bohemica*, *Anthericum liliago*, *Pulsatilla pratensis*, *Cerasus fruticosa*, *Leopoldia tenuiflora* etc. This habitat is not cultivated at present; in the past it has been used extensively for pasturing.

The habitat "Korecký vrch" is rather a colder and moister habitat (7-7.5° C and 620 mm) at 465 m above sea level. The area includes mountain and hylophile species in this habitat [e.g., *Osmia* (*Centrosmia*) *nigriventris* ZETT.]. The habitat belongs to the Protected Landscape Area – Kokořínsko – with 270 square kilometres and the locality Korecký vrch is situated about 20 km North of the town of Mělník. The Kokořínsko is an area with a lot of hills about 400-500 m above sea level and of volcanic origin ("Korecký vrch" has also eruptive origin). The weather is affected by the warm Elbe Valley. The forest consists of 75 % of its original species composition – vegetation degree according to CULEK et al. (1996) is from No. 2: beech (*Fagus*), horn-beam (*Carpinus*) and oak-grove (*Quercus*) to No. 4 (beech forest); according to NEUHÄUSLOVÁ et al. (1998) this region is an acidophilous beech – woodrush-beech woodland. Relics of pinewood and swamps are scarce. The peak of Korecký vrch is forestless and rocky (about 0,5-1 ha); the vegetation on the peak is typical of rocky vegetation with *Festuca glauca*.

Pyrobombus (*Melanobombus*) *sicheli* (RADOSZKOWSKI, 1859)

Taxonomy and distribution:

Only five subspecies are presently valid (TKALCŮ, 1974a; RASMONT, 1983):

a) *P. sicheli sicheli* – the nominotypical subspecies distributed from Siberia to Biłowieża in east Poland, a distribution map is depicted in REINIG (1935: 345);

– subspecies between Kamchatka and Białowieża, listed in REINIG (1935), are synonyms to the nominotypical subspecies since they range in a continuous line without any geographic isolation

b) *P. sicheli cazuroi* (VOGT, 1911) – the Northwestern Caucasus; ÖZBEK (1998) did not mentioned any subspecific characters, only remarking on the low abundance of this taxon;

c) *P. sicheli drenowskii* (VOGT, 1911) – in the Balkan mountains (Bulgaria and Jugoslavia); TKALCŮ (1969) as *P. sicheli alticola*;

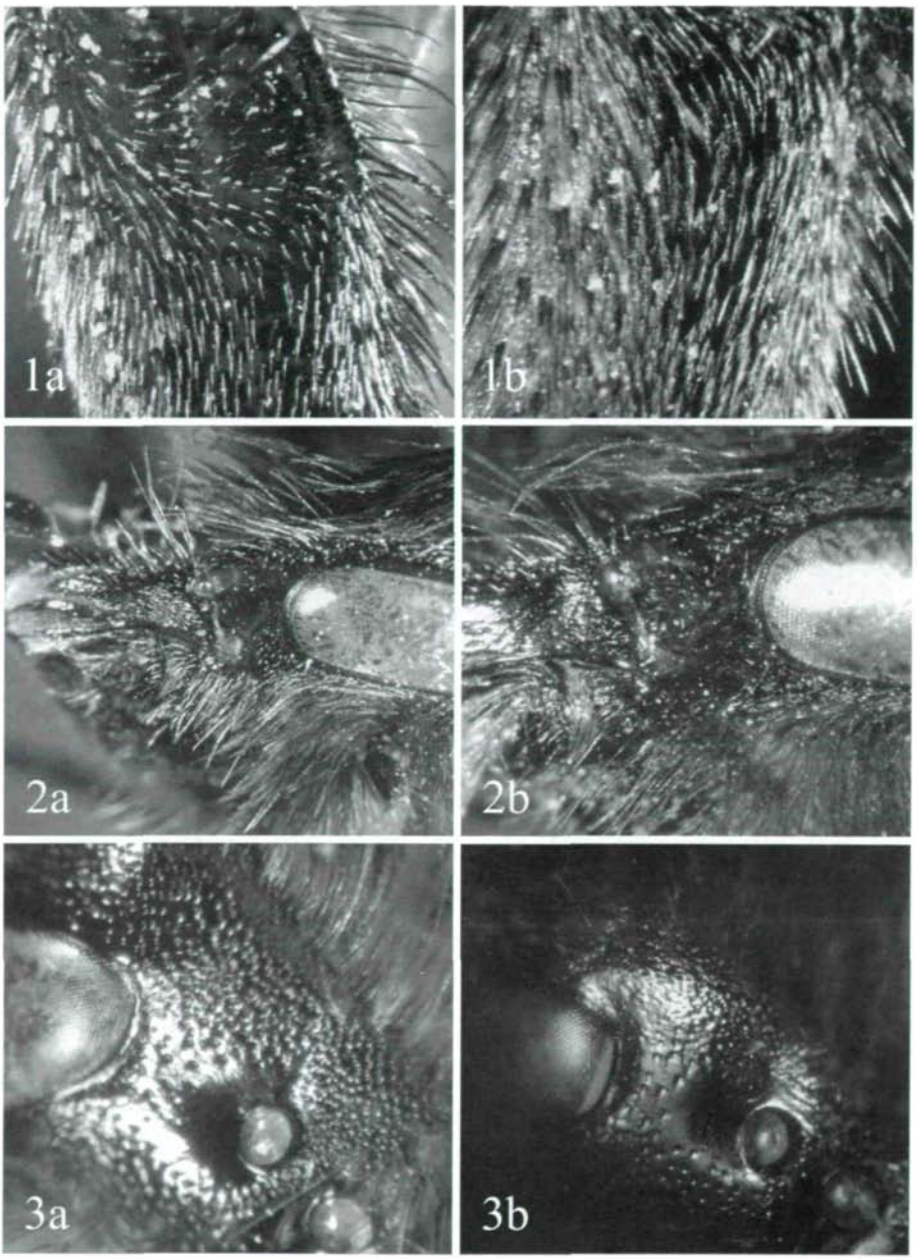

Fig. 1: Character of hairs on outer surface of metabasitarsus in females - **a)** *P. (C.) semenoviellus*, **b)** *P. (P.) jonellus*. **Fig. 2:** Malar area in females - **a)** *P. (C.) semenoviellus*, **b)** *P. (P.) jonellus*. **Fig. 3:** Punctation of supraorbital area of the vertex in females - **a)** *P. (C.) semenoviellus*, **b)** *P. (P.) jonellus*.

Fig. 4: Male genitalia - **a)** *P. (C.) semenoviellus*, **b)** *P. (P.) jonellus*, **c)** *P. (M.) lapidarius*, **d)** *P. (M.) sicheli*, **e)** *P. (K.) soroeensis*.

d) *P. sicheli alticola* (KRIECHBAUMER, 1873) – the Alps subspecies;

e) *P. sicheli flavissimus* TKALCŮ, 1974 – the Pyrenees subspecies.

The summarised arguments by TKALCŮ (1974a) are as follows: the nominotypical subspecies extends in the north branch from Kamtchatka to Biłowieża. The colour of the thoracic bands and the proximal abdominal band are rather grey in tone by contrast to the south branch (from the Caucasus to the Pyrenees) which have markedly yellow tones to their bands. In the Pyrenees the intensity of the colour is consistent with the Alps or Balkans subspecies but the thoracic bands are to some degree wider.

MOCSÁRY (1897: 133) published a record of *Bombus alticola* near to the town of Trenčín in western Slovakia (7174; Fig. 6). However, MOCSÁRY (1910) has amended this record as a lapse of identification.

Identification

There is no other *Melanobombus*-species in the Central Europe with red terminal abdominal terga combined with yellow bands anteriorly on the mesonotum and posteriorly on postscutellum in females. The ☿☿ of *P. sicheli* bear a strong resemblance to those of *Pyrobombus* (*Pyrobombus*) *pyrenaeus* (PÉREZ, 1879) with regard to their colour-pattern so that they could be a quick glance confused with them. The latter species is absent in the Czech Republic indeed but is widely distributed in the high mountains regions of Slovakia. Nevertheless, the ☿☿ of both species can be easily separated by means on the following comparison (p. 324).

The characteristics numbered 1, 2, 3, 4, and 7 are evidently of a qualitative value, the remaining two are more or less only of quantitative nature. When using the above/mentioned comparison it is necessary to be aware of the fact that the morphological specific features could be somewhat indistinct in smaller ☿☿, in larger individuals they used to be mostly better developed. The ♀♀ of *P. sicheli* can be easily distinguished from those of *P. pyrenaeus* by the presence of the typical rounded convexity (a supraspecific character in the subgenus *Melanobombus*) on the dorsal surface of 6th tergum. The males of both species are (in spite of the striking similarity of their color-pattern) perfectly separated by their genitalia showing distinct subgeneric features. The genital in Fig. 4b is similar to *P. pyrenaeus* (apex of penis valve is round) and genitalia in Figs. 4c,d belong to *Melanobombus*-species (apex of penis valve is typically pointed).

Character	*P. sicheli* I ♂	*P. pyrenaeus* I ♂
1. punctation of supraorbital area	rather regular and crowded, interspaces between punctures only narrow	scarcer, fine punctures predominating, interspaces irregular (likewise as in Fig. 3b)
2. ocello-ocular area	with a small group of very fine punctures (10-15µm) near the inner margin of eye	missing such a group of fine punctures
3. disc of clypeus	more flat in the middle, without any isolated coarse punctures	more convex, in the middle with some irregularly scattered coarse punctures
4. lateral tubercules of labrum	more prominent and humpty; therefore, mediobasal furrow broader and deeper	more flattened; mediobasal furrow narrow and shallower
5. whitish or yellowish pubescence between the antennae	usually a (small) tuft at least	face without light hairs
6. the posterior yellow hair band on the thorax	fully developed (namely in ♀)	partially reduced (namely in I)
7. outer surface of metatibie	distinctly chagreneened throughout	smooth and strongly shining (only in a narrow apical part delicately chagreneened

The body hair colouration in males is similar to some phaenotypes of the males of *Pyrobombus* (*Kallobombus*) *soroeensis proteus* (GERSTAECKER, 1869). However, there are several supraspecific characters typical of the subgenera *Kallobombus* and *Melanobombus* which can be used for distinguishing them as follows:

Character	*Melanobombus* %	*Kallobombus* %
shape of metabasitarsus (this character can be used while sampling in the field)	only posterior margin is slightly convex (Fig. 8a);	Both margins · anterior and posterior are convex, therefore, metabasitarsus is narrow at its base and ist shape is similar to the shape of bottle (Fig. 8b).
the length of F1 (for identification in lab)	F3 ≥ F1 > F2 (Fig. 7a)	F3 > F1 ≤ F2 (Fig. 7b)
recurved hook at apex of penis valve	pointed and curved inward a recurved hook (Fig. 4c and d);	rounded and curved outward a recurved hook (Fig. 4e).

The *P. sicheli* male is sometimes similar to *P. soroeensis proteus* and especially to *P.* (*Melanobombus*) *lapidarius* (LINNAEUS, 1758) – namely in the genitalia but little differences are developed on squama and inner medial margin of the lacinia – compare Figs. 5a) and 5b). The most distinctive character between both species is in the colouration of hairs on the 1st and 2nd abdominal terga – the hairs are yellow in *P. sicheli* but in *P. lapidarius lapidarius* they are completely black. *P. lapidarius* is most closely related to *P. sicheli*.

New records for the Czech Republic and Slovakia:

M a t e r i a l : Czech Republic, Moravia mer. or., White Carpathians Mts., Jelenec (peak 925 m above sea level), faunistic square 7172 (Fig. 6, the black square), 48° 52' N, 17° 42' E, 30. vi. 1997, 1♀, lgt. & coll. P. Bezděčka, det. A. Přidal et B. Tkalců.

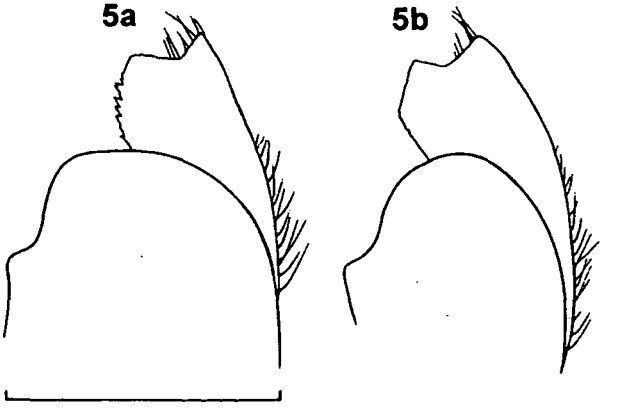

Fig. 5: Apical margin of squama and the shape of gonostylus of the male genitalia - **a)** *P.* (*M.*) *lapidarius* (inner margin of gonostylus slightly rounded and serrated); **b)** *P.* (*K.*) *soroeensis* (inner margin of gonostylus obtusely angulated, hardly serrated). Scale = 0.5 mm.

Comments on the record:

During the sampling trip only one fair ♀ has been captured by Mr Pavel Bezdečka in the White Carpathian Mts. on the peak of Jelenec (925 m above a sea level) (Fig. 6). The specimen was collected on the boundary of the Czech Republic and Slovakia, therefore, this species is new for the fauna of both republics! Concurrently, it is the southernmost and easternmost record of the nominotypical subspecies of this species. This specimen was identified among extensive material of the mentioned collector.

The first author of this study repeatedly endeavoured to find this species in the same place and in the surrounding area. He has not succeeded as yet, thus, only the one ♀ exists. Therefore, we have not previously published this record. Since *P. semenoviellus,* a taiga species, was found in Germany and recently in the Czech Republic, we suppose that *P. sicheli* is another taiga representative, with the same trend to spread into Central Europe.

The specimen has colouration typical of the north branch of the species distribution, i.e., the blonde hairs are of a grayish shade. Therefore, we suppose that this specimen is representative of the taiga subspecies from the north rather than of the orophilous subspecies *P. sicheli alticola* from the south Alps.

The first author of this study continues in the faunistic exploration of the apidofauna in the White Carpathian Mts. owing to the support of the Administration of the Protected Landscape Area and Terrestrial Natural Reserve of UNESCO White Carpathians.

Comments on locality:

The White Carpathians are the westernmost part of the Carpathian Mountains with the highest peak Velká Javořina (CZ)/Veľká Javorina (SK) 970 m above level sea – i.e., about one kilometre from the peak Jelenec – place of the record of *P. sicheli.* The W. Carpathians is a very contrasting territory. Besides the mountain range there are also very valuable floral meadows consisting of mesophytes and xerophytes. The vegetation degree according to CULEK et al. (1996) is No. 3 and 4 (oak-beech and beech). There are also very valuable original beech forests (*Fagus*) in the middle and the northern parts of this protected area (which was proclaimed in 1996 as the Biospherical Natural Reserve of UNSECO). By contrast, south parts of the W. Carpathians are one of the warmest places in the Czech Republic. The peak „Jelenec" is a part of the Javořina's hills; part of the National Nature Reserve because of the originally widely distributed beech forests of primeval character. The peak of Velká Javořina is forestless – there are only meadows and during the summer characteristic hill-toping activities of bumble bee drones can be seen here on a large scale. It is possible here to find drones of strictly eremophilous species [for example *Psithyrus maxillosus* (KLUG, 1817), *Megabombus ruderatus* (FABRICIUS, 1775)] besides the strictly hylophilous or orophilous species [*Psithyrus norvegicus* SPARRE-SCHNEIDER, 1918 and *Pyrobombus soroeensis* (FABRICIUS, 1776)]. It is an ecological phenomenon typical of the W. Carpathians because valleys of these mountains extend into the north part of Pannonicum.

Comments on the climate:

The average annual temperature on Jelenec is under 6° C and year-sum precipitation is about 1000 mm; in Strání valley 7.6° C and 850 mm. Therefore, the territory is very humid in spite of the high temperature. More information, including maps, are given in KUČA at al. (1992), with an English summary, and at http://bilekarpaty.cz/ (but only in Czech).

Discussion

Aside from the possibility that both taiga species are relicts of a former and larger Taiga, there are other potential explanations for the discovery of these new records. It is also plausible that both records are the result of new and/or unknown adaptive factors influencing the expansion of taiga bumble bee species. Białowieża – the place of the latest westernmost record of *P. sicheli sicheli* – is continuous with the remainder of the taiga and it is, therefore, not unexpected that this species should be found there. Carpathians belong to the Carpathicum and Pannonicum rather than to the complex of taiga forests in spite of their large beech forests. The record of *P. semenoviellus* in the Czech Republic – the north and central Bohemia – is absolutely out of contemporary Taiga and the character of the both habitats is different (might this be the development of a wider ecological niche as part of novel adaptations in this bumble bee species?). Accordingly, we suppose that these taiga species are much more widely distributed in Poland, Germany, Slovakia and the Czech Republic than is known at present. This presumption clearly needs further investigation. For example, *Megabombus* (*Thoracobombus*) *schrencki* (MORAWITZ), a further taiga species, has recently been discovered again in northeastern Poland and in abundant populations (KRZYSZTOFIAK, 1992). Is this not a further reason for the anticipation that taiga bumble bee species (or even other species?) are spreading westwards out of the Taiga?

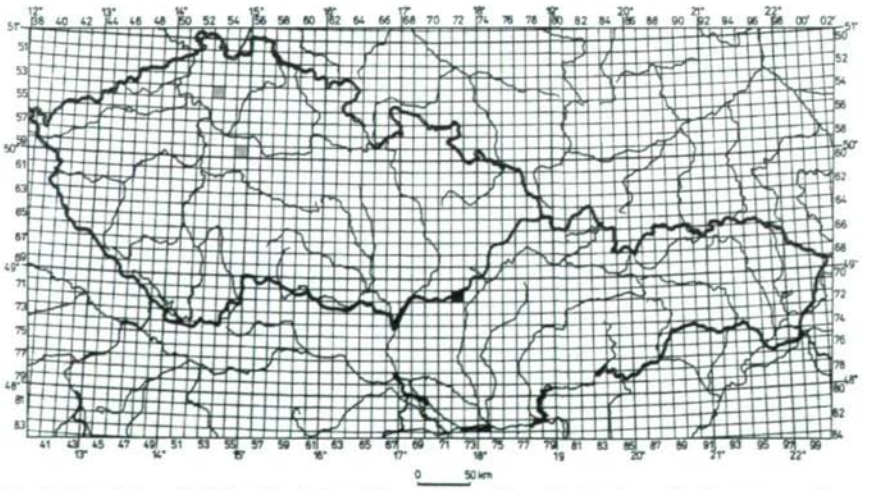

Fig. 6: Faunistic grid of the Czech Republic and Slovakia with figuring of both new records.

■ *Pyrobombus semenoviellus* ■ *Pyrobombus sicheli*

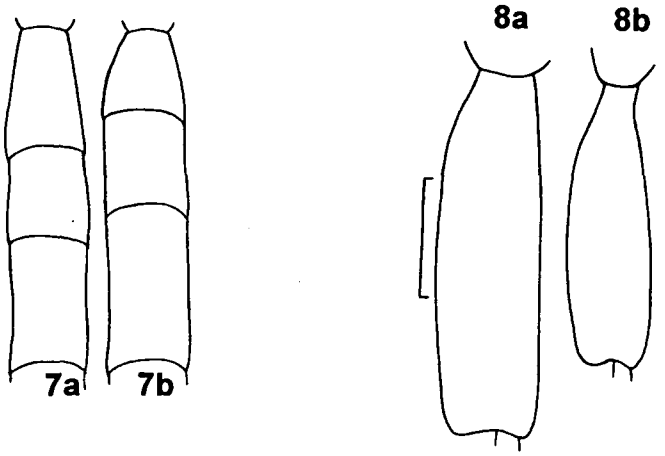

Fig. 7: Three basal flagellar segments of the right antenna in males – **a)** *P.* (*M.*) *lapidarius*; **b)** *P.* (*K.*) *soroeensis*. Scale = 1 mm. **Fig. 8:** Shape of the right metabasitarsus in ♂ - **a)** *P.* (*M.*) *lapidarius*; **b)** *P.* (*K.*) *soroeensis*. Scale = 1 mm.

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Buchbesprechungen

"Weltweite Checkliste der Bienengattung *Andrena* mit Bemerkungen und Ergänzungen zu paläarktischen Arten (Hymenoptera, Apidae, Andreninae, *Andrena*)"

Fritz GUSENLEITNER & Maximilian SCHWARZ

Publishing date: 31.12.2002. Size: 21,5 x 15,5 cm. 1280 pages incl. 531 distribution maps. In German language with English summary. Softcover.
Entomofauna, Supplement **12**, Ansfelden, Austria

This catalogue comprises all taxa of the bee genus *Andrena* described worldwide (3001 species descriptions inclusive synonyms and renamings). For the nearctic region as far south as Panama 515 valid species are recently known and for the palearctic region as south as the Malay peninsular (oriental region) 931 valid species are described. *Andrena barbilabris* (KIRBY 1802), *A. clarkella* (KIRBY 1802) and *A. wilkella* (KIRBY 1802) are the only holarctic distributed species. The genus *Andrena* does not occur in Australia. Despite many species north of the Sahara, Africa holds only 8 species south of it. 7 descriptions of fossil *Andrena*-species are known, 104 *Andrena*-descriptions turned out to belong to other genera or could not be classified. The palearctic species are attributed to 67 subgenera, whereas the nearctic species belong to 49 subgenera. Only 17 subgenera are classified as holarctic. 41 taxa still cannot be positioned according to subgenera.

Each description contains the original citation, information about locus typicus and the deposition of the holotype as far as known. For palearctic species further information concerning taxonomy, literature and published figures, drawings etc. are added. The distribution of most of westpalearctic species is presented by distribution maps. The listed literature comprises the whole taxonomic literature as well as all important papers concerning the genus *Andrena* but not the main part of faunistic literature.

The species list is sorted alphabetically. The recent and not always clearly identified attribution to subgenera is shown. It must be kept in mind, that this actually used system does not correspond to phylogenetic standards, because all information is based only on morphological analysis. The use of subgenera can be helpful for the rough sorting of supra genera despite the fact that according to nomenclature the sorting in species groups should be prefered.

This book will be an indispensible tool for everybody studying the bee genus *Andrena*, both now and in the future.

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Neuerscheinung

"Zur Geschichte der Entomologie in Österreich"

Denisia, Bd. 8 (September, 2003), Linz, 328 Seiten, mit zahlreichen SW-Fotos
Preis (exkl. Versand) 45 €

Bestellung unter: *http://www.biologiezentrum.at/biowww/de/biblio/denisia.php*
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oder J.W.-Klein-Str. 73, 4040 Linz, Austria; z.H. Fr. W. STANDHARTINGER

Der letzte generelle Überblick über das entomologische Schaffen Österreichs erschien 1901 als Festschrift der Zoologisch-Botanischen Gesellschaft in Wien (HANDLIRSCH & WETTSTEIN 1901). Bis 1900 berücksichtigt auch der Index Litteraturae Entomologicae die frühe entomologische Literatur Österreichs. In den vergangenen 100 Jahren gab es zwar zahlreiche monographische Gruppenübersichten, aber keine Gesamtschau über das Schaffen der Entomologen Österreichs. Die Entomologie ist in Österreich seit nahezu 250 Jahren wissenschaftlich etabliert. Die Jahrtausendwende war ein motivierender Anlass dazu, die Entstehung und Weiterentwicklung dieser Forschungsdisziplin in Österreich zu beleuchten. In Vorbereitung dazu veranstaltete die Österreichische Entomologische Gesellschaft im Oktober 1998 am Biologiezentrum in Linz ein Fachgespräch zum Thema "Zur Geschichte der Entomologie in Österreich". Das Ergebnis liegt nun in gedruckter Form vor.

Inhalt

New publication

"Annotated Bibliography of Russian and Soviet Publications on the Bees (Hymenoptera: Apoidea; excluding *Apis mellifera*): 1771-2002"

Yuriy A. PESENKO & Yulia V. ASTAFUROVA

Denisia, Vol. **11** (December 2003), Linz, 616 pages,

Order: *http://www.biologiezentrum.at/biowww/en/biblio/denisia.php*
or *bio.buch@landesmuseum-linz.ac.at*
or J.-W.-Klein-Str. 73, A-4040 Linz, Austria; attn. Mrs. W. STANDHARTINGER

The Bibliography includes all scientific papers concerning melittology (a field of the study of bees in all aspects except for those related to management and practical utilisation of *Apis mellifera*) published by citizens of the Russian Empire and/or the former Soviet Union. The publications are annotated in English, but also provided with original spelling of the author(s), title and source. Their description includes additional characteristics: main language of the publication; language of the summary; number of figures, tables, and references; date of publication. Publications are arranged according to the Latin alphabet of author names and in chronological order for publications of each author. The Bibliography comprises of 3027 publications written by 1126 authors (including co-authors). The distribution of publications over main topics is as follows: fauna (772); taxonomy (371); anatomy, physiology, biochemistry, genetics and allied (178); bionomics and behaviour (769); associations with wild angiosperm plants (404); ecology (140); pollinators of cultivated plants (681); conservation and protection (254); management of non-*Apis* bees (252); In all, the Russian and Soviet authors (27 persons) described 103 new taxa of genus-group and 1552 new taxa of the species-group of bees; of these, 725 new species (*i.e.* nearly one fourth of the Palaearctic fauna) were described by F. MORAWITZ; the overwhelming majority of the species is currently recognised. 769 publications by 310 authors treated on the bionomics and behaviour of Apoidea contain original information on 262 species. The publications dealt with associations of Apoidea and angiosperm plants contain data on trophic links of about 550 bee species of 51 genera and on pollinators (or visitors to flowers) of over 500 plant species of 167 genera belonging to 69 families; also in 50 publications by 32 authors, During 1771-2002, the numbers of the publications on melittology increased more or lees evenly by distinguished periods: from 7 publications by 3 authors in the period of 1771-1800 and 11 publications by 7 authors in 1801-1850 up to 764 publications by 430 authors in the period of 1981-1990 and 731 publications by 421 authors in 1991-2002. The book is provided with 7 appendices: (I) Brief biographies of the main late authors (E. EVERSMANN, O. RADOSZKOWSKI, F. MORAWITZ, A. FEDTSCHENKO, N. KOKUJEV, A. SKORIKOV, S. MALYSHEV, V. POPOV, V. GUSSAKOVSKIJ, D. PANFILOV, Nina BLAGOVESHCHENSKAYA, Anna OSYTSHNJUK, Asya PONOMAREVA and Tatyana MARIKOVSKAYA), (II) Biographical data and addresses of 18 main working authors, (III) Publications on the bee fauna of Russia by foreign authors (91 titles), (IV) General and regional bibliographic publications on zoology and entomology examined (41 titles), (V) Changes of names of cities in the former USSR (137 names), (VI) Periodicals cited (characteristics of 284 Russian and Soviet periodical publications), (VII) Subject index (433 items).