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Present distribution of the paper wasp *Polistes bischoffi* WEYRAUCH 1937 in the Czech Republic and in Slovakia with notes to its spreading (Hymenoptera: Vespidae)

L. DVOŘÁK, V. SMETANA, J. STRAKA & P. DEVÁN

Abstract: The authors summarise all known data on the distribution of the paper wasp *Polistes bischoffi* WEYRAUCH 1937 in the Czech Republic and in Slovakia. Localities in the southern parts of the Czech Republic and in northwest Slovakia form a part of the present northern border of the distribution range of this species in Europe. The whole distribution range of this species is discussed as well as observation of its nest usurpation by *P. dominulus* CHRIST.

Key words: paper wasp, *Polistes bischoffi*, Czech Republic, Slovakia, distribution, spreading

Introduction

Polistes bischoffi WEYRAUCH 1937 is the latest member for the fauna of social wasps of Central Europe. This species with south European origin (GUIGLIA 1972) spreads to the north and east in last three decades. The first records for Moravia (STRAKA 2000), North Rhine-Westphalia (MAUSS 2001), Bohemia (STRAKA et al. 2004) or Hesse (SCHMALZ 2006) were published recently. This paper summarizes all known distribution data of *P. bischoffi* from the Czech Republic and from Slovakia where it has been recorded for the first time.

Results

All known localities of *Polistes bischoffi* in the Czech Republic and in Slovakia are listed. The localities are arranged in accordance with the geomorphological units. All records are supplemented with: Number of faunistic code of the Central European grid system, date of collection, number of specimens (σ = male, φ = female), collector, author of determination and place of collection (material was determined by owner of the collection when no author of determination is mentioned). Names of the authors are abbreviated: LD = Libor Dvořák, JS = Jakub Straka, VS = Vladimír Smetana, and PD = Pavel Deván. References are given for records that have been published before.

Czech Republic - Bohemia

- B l a t e n s k á P a h o r k a t i n a h i l l s**: Buzice (6549), dry hillside, 2.9.1999, 1 ♀, Moericke trap, P. Bogusch leg., JS coll. (STRAKA et al. 2004). Těchonice (6647), dry meadow, 5.-7.9.2005, 1 ♀, Moericke trap, J. Farkač leg., JS coll.; sedge meadow, 27.-29.7.2005, 1 ♀, 5.-7.9.2005, 1 ♀, Moericke trap, both J. Farkač leg., JS det., LD coll.
- B o h e m i a n F o r e s t (= Š u m a v a M t s .) f o o t h i l l s**: Čepice (6747), meadow NW of a village, 6.10.2005, 1 ♂, LD leg. Úbislav (6847), in a village, 12.10.2005, 1 ♀, LD leg. et coll. Kváskovice (6848), near a road NE of a village, 19.9.2004, 2 ♂ ♂, LD leg. et coll. Rohanov (6848), meadow NW of a village, 9.10.2005, 1 ♀, LD leg. et coll., J. Gusenleitner det. Vacov (6848), near a dumping ground W of a village, 28.9.2005, 1 ♀, LD leg. et coll. Zálesí – U Benedy (6848), clear-cut W of a village, 5.9.2004, 1 ♂, LD leg. et coll. Vrbice (6848), SE periphery of a village, 18.9.2004, 1 ♂, LD leg. et coll.; in a village, 28.9.2005, 1 ♂, LD leg. et coll. Čkyně (6849), near Volyňka River E of a village, 30.7.2004, 1 ♀, LD leg. et coll., J. Gusenleitner det. Čkyně (6849), by road SE of a village, 30.7.2004, 1 ♀, LD leg. et coll., J. Gusenleitner det. Zechovice (6849), old quarry environ, 10.7.2003, 1 ♀, P. Bogusch leg., LD coll. Prachatice (6949-50), 24.8.1999, 1 ♀, M. Snižek leg., J. Gusenleitner det., Museum Linz coll. (STRAKA et al. 2004). Tušův (7151), 25.8.2001, 2 ♂ ♂, Z. Karas leg. et coll., LD det.
- B o h e m i a n F o r e s t (= Š u m a v a M t s .)**: Zadov (6947), Pod Kobylou, in a village, 7.9.2005, 1 ♂, LD leg. et coll.
- T ř e b o ň s k á P á n e v b a s i n**: Vlkov nad Lužnicí (6854), 18.9.2004, 1 ♂, P. Bogusch leg., LD coll. Veselí nad Lužnicí (6854), Ruda National Reserve, wet meadow, 18.9.2004, 1 ♂, J. Růžička leg. et coll., LD det. Chlum u Třeboně (7055), 9.1999, 1 ♂, J. Halada leg., J. Gusenleitner det., Museum Linz coll. (STRAKA et al. 2004). Majdalena (7055), 9.1983, 2 ♂ ♂, K. Deneš leg., J. Gusenleitner det., Museum Linz coll. (STRAKA et al. 2004).
- N o v o h r a d s k é H o r y M t s . f o o t h i l l s**: Rychnov nad Malší (7352), 26.7.1997, 1 ♀, K.-H. Schmalz leg. et coll., V. Mauss det.

Czech Republic - Moravia

- J e v i š o v i c k á P a h o r k a t i n a u p l a n d**: Nový Hrádek (7161), 25.6.1996, 1 ♀, J. Vilímová leg., JS det., Charles University Prague coll.
- M i k u l o v s k á V r c h o v i n a h i g h l a n d**: Dívčí hrady (7165), steppe, 22.6.2005, 1 ♀, P. Bogusch leg., LD coll.
- B o b r a v s k á V r c h o v i n a h i g h l a n d**: Brno-Bosonohy (6865), Leskava stream, 3.9.2005, 1 ♂, I. Malenovský & L. Dembický leg., LD det., Museum Brno coll. (DVOŘÁK 2005).
- D r a h a n s k á V r c h o v i n a h i g h l a n d**: Brno-Útěchov (6765), hornbeam forest, 16.8.1998, 1 ♀, P. Lauterer leg., LD det., Museum Brno coll. (DVOŘÁK 2005). Brno-Hády (6766), Hádecká Planinka National Reserve, steppe hillside, 8.8.2004, 1 ♂, LD leg. et coll.
- W h i t e C a r p a t h i a n s (B í l é K a r p a t y M t s .)**: Brumov-Bylnice (6874), Klobucká, mowed meadow, 8.5.2003, 1 ♀, P. Kment leg., LD coll. Tvarožná Lhota (7170), Lučina, 26.8.1999, 1 ♂, JS leg. et coll. Nová Lhota (7171), Havraní Pole, 22.8.1999, 4 ♀ ♀, JS leg. et coll. Nová Lhota (7171), Vápenky, 2.9.1998, 1 ♂, J. Strejček leg., JS coll. (STRAKA 2000); 23.8.1999, 15 in the pdf is M, replace by ♂ ♂, 11 ♀ ♀, J. Straka leg., JS et J. Hájek coll. (STRAKA 2000); 24.8.2000, 1 ♂, M. Fikáček leg., LD coll. Porážky (7171), 7.6.1997, 1 ♀, M. Kolísko leg., JS coll.; 23.8.1999, 6 ♂ ♂, 3 ♀ ♀, JS leg. et coll. Zahrady pod Hájem (7171), 2.8.1999, 1 ♀, A. Přidal leg., JS coll.
- D o l n o m o r a v s k ý Ú v a l l o w l a n d**: Bzenec (7069), 30.5.1998, 1 ♀, M. Říha leg., LD det., P. Průdek coll.

Slovakia

- White Carpathians (Biele Karpaty Mts.): Červený Kameň (6975), limestone rocks of the Červenokamenské Bradlo, 500 m a.s.l., 18.9.2004, 1♂, M. Horsák leg., LD coll. Zemianske Podhradie, Dúbravy (7172), oak forest margin (with *Rosa gallica*, *Peucedanum cervaria*, and *Bromus erectus*), 300 m a.s.l., 3.9.2004, 1♂, PD leg. et coll. Bošáca, Chúmy (7172), xerophilous meadows on flysh, 250 m a.s.l., 7.9.-5.10.2005, Moericke trap, 1♂, PD leg., VS coll.
- Mýjavská Pahorkatina highland: Bzince Pod Javorinou – Odbočka (7172), meadow in forests SW of a village, 6.8.2004, 1♀, LD leg. et coll., J. Gusenleitner det. Stará Turá – Paprad, Nemcova Dolina valley (7271), orchards, 420 m a.s.l., 19.8.2002, 1♂, PD leg. et coll.
- Považské Podolie lowland: Ivanovce, Morské Oko (7173), orchards by former settlement, 220 m a.s.l., 26.7.2002, 1♀, PD leg. et coll.
- Považský Inovec Mts.: Skalice pri Beckove (7273), xerophilous meadows and shrubs on limestone bedrock, 200-325 m a.s.l., 12.-25.8.2004, 1♂, 25.8.-10.9.2004, 1♂, Moericke traps in old quarry, PD leg. et coll.
- Strážovské Vrchy Mts.: Bindárka (7174), wet stands, 350 m a.s.l., 25.8.-10.9.2003, 3♂♂, Moericke traps, PD leg. et coll.
- Malá Fatra Mts.: Biele Skaly (6879), ecotone of mountain forest and dwarf pine forest, 1448 m a.s.l., 15.7.2002, 2♂♂, VS leg. et coll.
- Turčianska Kotlina valley: Turany (6880), pastures and groves near auto-camping Trusalová, 500 m a.s.l., 16.7.2002, 1♀, VS leg. et coll.

Behavioral observation

During the late summer in 1999, late phase of usurpation of *P. bischoffi*'s nest by *P. dominulus* was observed in the White Carpathians. Three females of *P. dominulus* were sitting on the small usurped nest and looked after new eggs placed in all cells. All eggs were the same age. Approximately seven females and males (several of them fly away and thus hardly countable) of *P. bischoffi* set on dog rose stalk about fifteen centimeters apart from their former nest. No *Polistes* behaved aggressively during observation.

Discussion and conclusions

The oldest record of *P. bischoffi* from the Czech Republic originates from 1983 (STRAKA et al. 2004). Further specimens were collected during 1996–2005 with a distinct increase in 1999 and later. *Polistes bischoffi* is restricted to the southern half of the Czech Republic. All localities represent open habitats, as steppes, meadows, hillsides or urban areas, with the exception of a single record from a hornbeam forest. In most cases high grassy vegetation is preferred and wasps are predominantly collected on Apiaceae flowers. Localities are situated between 320 m a.s.l. (Lučina in the White Carpathians) and 940 m a.s.l. (Zadov in the Bohemian Forest). For distribution in the Czech Republic see Fig. 1.

The earliest records from Slovakia were made in 2002 and more localities were discovered in 2004 and 2005. As in the Czech Republic, *P. bischoffi* inhabits predominantly open stands in Slovakia. Most of the localities are situated in lower altitudes (between 220 and 500 m a.s.l.), but the species was also found in high regions of the Malá Fatra Mts. (1448 m). Both specimens from Biele Skaly and Zadov can be records of acciden-

tally wandering individuals, which do not live in so high altitudes for a longer period (A. CETKOVIC, pers. comm.). Interesting is the fact, that *P. bischoffi* was found in the Moravian part of the White Carpathians in 1998 for the first time (STRAKA 2000), while it was found in the Slovak part of the White Carpathians and the surrounding areas for the first time in 2002. SMETANA (1998) did not record this species during his research. For distribution in Slovakia see Fig. 1.

The data listed above correspond very well with spreading of *P. bischoffi* in Europe. In the late 1970s the northernmost localities of the species in Europe were in Austria, southern Germany, and France (GUIGLIA 1972, GUSENLEITNER 1981, MAUSS 2001). The fast spreading started during the 1980s and 1990s, and until now the species has been found in Belgium (BAUGNÉE 1996), Luxembourg (SCHNEIDER et al. 1998), northern parts of Germany (MAUSS 2001, SCHMALZ 2006), Bohemia (STRAKA et al. 2004), and Moravia (STRAKA 2000).

At present, this species is listed from Spain, France, Italy, Sicily, Sardinia, Corsica, Belgium, Luxembourg, Switzerland, Germany, Austria, Czech Republic, Slovakia, Hungary, Croatia, Yugoslavia (Serbia and Montenegro), Greece, Malta, and Turkey (CARPENTER 1996, STRAKA 2000, MAUSS 2001, ČETKOVIC 2002).

Spreading of *P. bischoffi* is supported by three new finds from Kazakhstan: Koksuy valley, NE Rudnichy, 78°58'E, 44°41'N, 1300-1400m, 10.6.2001, 2 ♀♀, M. Hauser leg. et coll., J. Gusenleitner det.; Koktal-Schlucht S Dschung Alatau, 79°12'E 49°35'N, 26.7.2002, 2 ♀♀, Tekeli 20 km NE, W Dschung Alatau, 78°53'E, 44°56'N, 23.7.2002, 2 ♀♀, all T. Osten leg., J. Gusenleitner det., Naturkundemuseum in Stuttgart coll.

P. bischoffi is widely distributed in Austria (see map in GUSENLEITNER 1995 and additions in GUSENLEITNER 1996, 1998) and southern parts of Germany (see map in MAUSS 2001). Northernmost localities of this species did not cross 51° N and northern border is limited in Belgium, in Germany at ca. 50°40' N, in the Czech Republic at ca. 49°30' N, and in NW Slovakia. The eastern continuous border of its range in Europe is unknown because data from eastern Balkan and eastern Europe are not available. The knowledge about the distribution of *P. bischoffi* in Turkey is fragmentary, and only two localities of *P. bischoffi* are known (YILDIRIM & KOJIMA 1999). The occurrence in Kazakhstan is isolated.

Observation of nest usurpation by *P. dominulus* gives evidence of weak competitiveness of *P. bischoffi*. However, this behavior seems to be rare or rarely found. Observed situation from the White Carpathians is simply reproducible. The meadows were closely after grass cut down and *Polistes* individuals lost its nests. In such situations is nest usurpation common (FIELD 1992). *P. bischoffi* may resist to *P. dominulus* due to smaller cell diameter, which could be hardly acceptable for usurpers.

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Zusammenfassung

Es werden alle bekannten Funddaten zur Verbreitung von *Polistes bischoffi* WEYRAUCH 1937 aus der Tschechischen Republik und aus der Slowakei zusammengestellt. Die Fundorte liegen im Süden der Tschechischen Republik und im Nordwesten der Slowakei und bilden einen Teil der gegenwärtigen nördlichen Grenze des Verbreitungsareales dieser Art in Europa. Sowohl die Gesamtverbreitung der Art als auch die Usurpation ihres Nestes durch *P. dominulus* CHRIST werden diskutiert.

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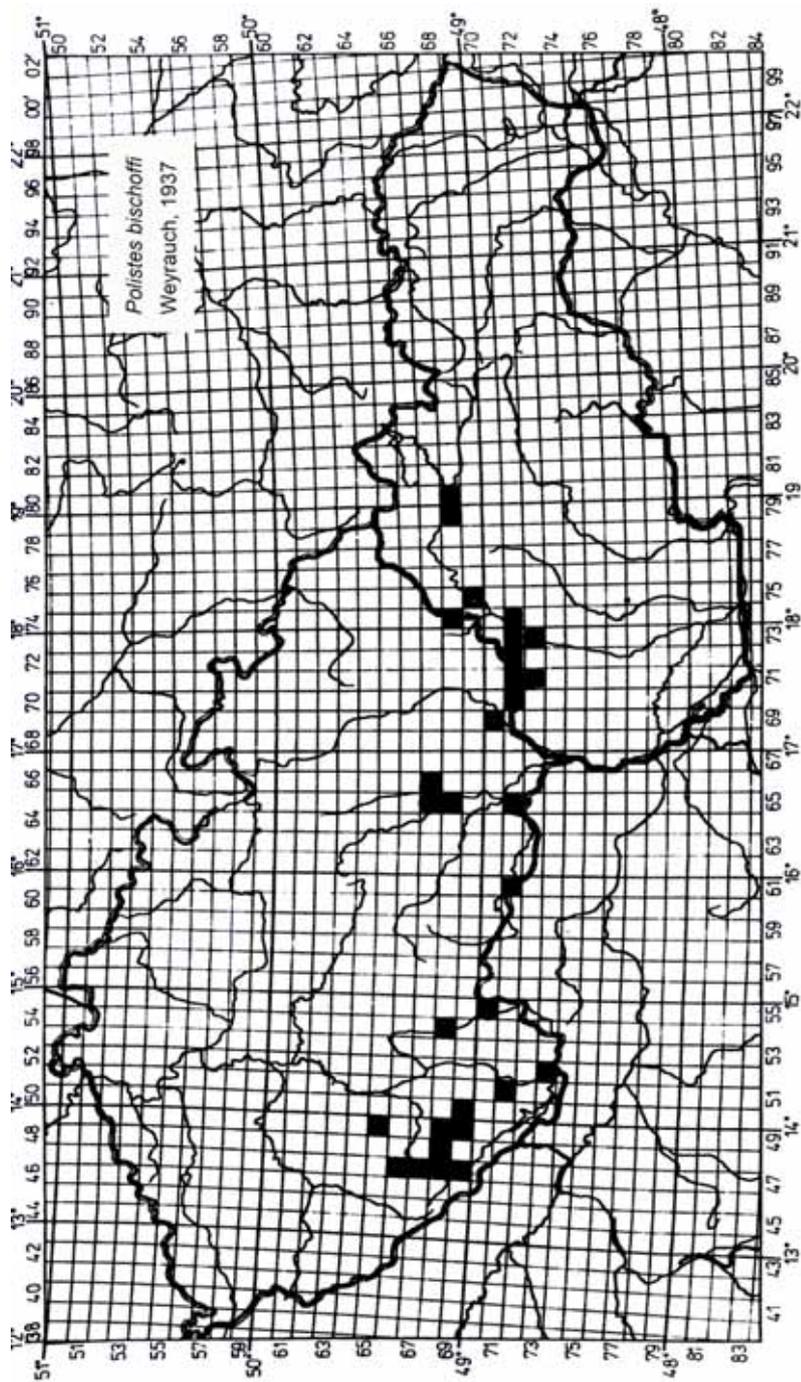


Fig. 1. Present distribution of *Polistes bischoffi* WEYRAUCH, 1937 in the Czech Republic and in Slovakia.