

Spreading and summary of the knowledge of the invasive sphecid wasp *Sceliphron curvatum* (SMITH 1870) in the Czech Republic and Slovakia (Hymenoptera: Apocrita, Sphecidae)

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A b s t r a c t : This study summarizes all localities of the invasive mud dauber wasp *Sceliphron curvatum* (SMITH 1870) in the Czech Republic and Slovakia. First records of this species for Slovakia are presented. This sphecid wasp settled Europe in 1979 and has been spreading in all directions since that time. Presently, it is known from 12 European countries. The occurrence of this species in Slovakia and in the Czech Republic was for the first time confirmed in Devín (1997) and in Praha (2001), respectively. Recently, altogether 25 localities are known, 12 of which in the Czech Republic and 13 in Slovakia. The localities are situated in 8 squares in both countries. The biology of this species is also discussed and our results generally agree with the published data originating in other countries, e.g. India.

K e y w o r d s : *Sceliphron curvatum*, Bohemia, Moravia, Slovakia, distribution, biology

Introduction

Sphecid wasps of the genus *Sceliphron* KLUG 1801 are widely distributed in all regions of the world. There are several species in Europe and *Sceliphron destillatorium* (ILLIGER 1807) has been recorded in the Czech Republic and Slovakia (PÁDR 1989). This species looks very conspicuous, as its body is 30 to 40 mm long and coloured black and yellow. It is known as a rare species nesting around small towns and villages and building nests of mud on rocks and houses. The northwest border of the distribution area of *S. destillatorium* crosses the Czech Republic and heading to the southeast, the species becomes more abundant (CELARY 1996; BOGUSCH et al. 2004).

Sceliphron curvatum (SMITH 1870) is smaller (between 15 to 25 mm long) and is coloured black with yellow and red ornaments. It builds nests of mud on the walls of buildings but also very often indoor on piles of books, clothes or pieces of furniture (GEPP & BREGANT 1986; GEPP 1995; BOGUSCH et al. 2004). Every nest is filled with paralyzed spiders, which serve as food for the larvae. This species represents a new sphecid wasp for Europe. Formerly, the species was distributed in India, Nepal, Pakistan, Kazakhstan and Tadjikistan in submontaneous regions at the highest mountain ranges of the world: Himalayas, Karakoram and Pamir (HENSEN 1987). The first record in Europe dates back to 1979 and is represented by a female collected near the village Grötsch in

southeastern Austria (VAN DER VECHT 1984). Since 1979 the species has expanded to other European countries: Slovenia (GOGALA 1995), Italy (SCARAMOZZINO 1995; PAGLIANO 2000; HELLRIGL 2001; SCHMID-EGGER 2001), Croatia (GUSENLEITNER 1996; STRAKA et al. 2004), Switzerland (GONSETH et al. 2001; SCHMID-EGGER 2001), France (GONSETH et al. 2001), Hungary (ZSOLT 2001), Germany (OHL 2003), Serbia and Montenegro (ĆETKOVIĆ et al. 2004), Greece (SCHMID-EGGER 2005) and also the Czech Republic (BOGUSCH et al. 2004; STRAKA et al. 2004) and Slovakia LUKÁŠ (2003).

The biology of this species was described for the first time by BASIL-EDWARDES (1921) in the Indian localities. The detailed description of its biology by GEPP & BREGANT (1986) based on the Austrian populations is the first source of these data coming from Europe. *S. curvatum* has been quickly enlarging its area in Europe and forming mighty populations in antropogenous localities (towns, villages) in southern and central Europe. BOGUSCH et al. (2004) discussed the origin of this species in Europe; they assume that *S. curvatum* was introduced to Europe as a result of human activity but after that the species has been spreading throughout Europe at most itself.

This study gives information about the distribution of *S. curvatum* in the Czech Republic and Slovakia. First records from Slovakia are presented here. Some aspects of this species' biology are discussed and compared with the published data.

Material and methods

All the material was collected in field and is preserved in corresponding collections. The brood from nests found in the localities was reared under laboratory conditions. All specimens are cited in appropriate part of the article; observations with no further evidence material were not submitted. The numbers mentioned in brackets at the locality represent the grid mapping square code used for the faunistic research in the Czech Republic and Slovakia (PRUNER & MÍKA 1996). Determination and nomenclature were done according to HENSEN (1987) and SCHMID-EGGER (2001).

Results and discussion

Localities of *Sceliphron curvatum* (SMITH 1870) in the Czech Republic and Slovakia

1. Bohemia centr., Praha – Nové Město, Charles University Botanical Garden (DFS 5952) (DFS – grid reference number of the Czech and Slovak Fauna), 19.VII.2001, 2♂♂, 1♀, all on woody banister, J. Straka lgt., det. and coll.; 12.VI.2003, 3♀♀, 28.VI.2004, 1♀, collecting clay at stream, P. Bogusch and M. Srba lgt., P. Bogusch det. et coll.; 5.I.2004, 1♂ ex pupae, P. Bogusch det. et coll.;
2. Bohemia centr., Praha – Motol, Klamovka (5952), 9.VI.2003, 1♀, with nest behind the painting on the wall in a living-room, collector unknown, J. Straka det. et coll.;
3. Bohemia centr., Praha – Žižkov, Vinohradská street (5952), 2.VIII.2003, 1♀, on a window of a house estate, M. Srba lgt., det. et coll.;
4. Bohemia centr., Praha – Nové Město, Albertov (5952), 28.IX.2003, 18 nests on a polystyrene board in a loft of the building of Charles University, Faculty of Science, collector unknown, J. Straka det. et coll.;

5. Bohemia mer., České Budějovice (7052), student's dormitory at Faculty of Biology, South Bohemian University, 30.VI.2004, 1 ♀, R. Lučan lgt., P. Bogusch det. et coll.;
6. Moravia centr., Pterov (6570), 19.VIII.2002, 1 ♀, at window, D. Vepřek lgt., det. et coll.;
7. Moravia mer., Brno – Bystrc (6765), 8.VIII.2003, 1 ♀, housing estate, in flat on the fourth floor, at window, P. Kment lgt., J. Straka det. et coll.;
8. Moravia mer., Brno (6865), 16.VIII.2004, railway station Brno hlavní nádraží, 1 ♀, M. Srba lgt., det. et coll.;
9. Moravia mer., Brno – Žabovřesky (6765), February 2004, housing estate, in flat, 2 ♀ ♀, I. Malenovský lgt., P. Bogusch det. et coll.;
10. Moravia mer., Moravský Krumlov (6963), July 2003, 1 ♀, at window, P. Janšta lgt. et coll., J. Straka det.;
11. Moravia mer., Vranov nad Dyjí (7160), castle, 15.X.2004, approximately 60 nests on backsides of two paintings indoors, May 2004, 1 ♀, M. Škorpík lgt., det. et coll., P. Bogusch revid.;
12. Moravia mer., Ladná (7167), petrol station, 31.VII.2004, M. Srba lgt., det. et coll.;
13. Slovakia occ., Devín (7867), 1.VII.1997, 1 ♂, J. Lukáš lgt., det. et coll.;
14. Slovakia occ., Bratislava, Faculty of Natural Sciences, Comenius University (7868); 15.VII.1998, 1 ♂, 10.VIII.2000, 2 ♀ ♀, 27.VI.2001, 1 ♂, 1 ♀, 3.VII.2002, 2 ♀ ♀, 1.VIII.2003, 3 ♀ ♀, 24.V.2004, 1 ♂, 22.VII.2004, 1 ♂, 9.VIII.2004, 1 ♀, 16.VIII.2004, 1 ♀, all J. Lukáš lgt., det. et coll.;
15. Slovakia occ., Bratislava, Faculty of Physical Education and Sports, Comenius University (7868), 13.VII.2002, 1 ♂, J. Lukáš lgt., det. et coll.;
16. Slovakia occ., Bratislava, Slovak National Museum, Museum of Natural History (7868), 15.VI.2002, 2 ♂ ♂, 2 ♀ ♀, V. Janský & I. Matejka lgt., J. Lukáš det. et coll.;
17. Slovakia occ., Bratislava, Institute of Zoology, Slovak Academy of Sciences (7868), 21.VII.2002, 2 ♂ ♂, 4 ♀ ♀, T. Čejka lgt., J. Lukáš det. et coll.;
18. Slovakia occ., Bratislava, Suťažná street 16 (7868), 1.VI.2003, in house estate, 2nd floor, bix of gasometer, 1 ♀ and 6 nests, J. Lukáš lgt., det. et coll.;
19. Slovakia occ., Bernelákovo (7768), 20.VII.2004, 2 ♀ ♀, M. Trubačová lgt., J. Lukáš det. et coll.;
20. Slovakia occ., Trenčín – Opatová nad Váhom (7074), 10.VIII.2004, 7 nests on a chair under a shirt, 10.IX.2004, 1 ♀, A. Liška lgt., P. Liška det. a coll.
21. Slovakia centr., Banská Štiavnica (7579), 15 Starozámecká street, on the top floor of the building, August 2002, 1 ♀ and 14 nests; June through September 2003, 74 nests and 5 ♀ ♀ observed, A. Dudich lgt., P. Bogusch det. et coll.;
22. Slovakia centr., Zvolen - Sekier (7480), in collection of minerals on the 6th floor of a block of flats, 20.V.2003, 6 nests and 1 ♀, K. Bučinová & A. Krištín lgt., A. Krištín det. et coll., P. Bogusch revid.;
23. Slovakia centr., Zvolen – mesto (7480), in old newspapers on the 3rd floor of the Institute of Forest Ecology, 12.VI.2003, 8 nests, F. Kundřík & A. Krištín lgt., A. Krištín det., P. Bogusch revid. et coll.;
24. Slovakia or., Bardejov (6793), house estate, window on the 2nd floor, 23.VI.2004, 1 ♀, J. Holtman lgt., det. et coll., P. Bogusch revid.;
25. Slovakia or., Košice – Barca (7393), 27.VII.2004, 2 ♂ ♂, 3 ♀ ♀, M. Sedlák lgt., P. Liška det. et coll.;

Above all known records of *Sceliphron curvatum* from the Czech Republic and Slovakia are listed. The first proven record of *S. curvatum* from Slovakia dates back to 1997 and 2001 in the case of Slovakia (locality 13) and the Czech Republic (locality 1), respectively. Even though there is no older published reference of *S. curvatum* from these countries, the sphecid wasp has been known from both countries since about ten years before. The first, however disputable note of "*Sceliphron*" in the Botanical Garden in Praha comes from early 1990s (P. ŠPRYŇAR pers. comm.). STRAKA et al. (2004) have

published first finds in the Czech Republic. LUKÁŠ (2003) brings new data from Slovakia (finds in Bratislava in the year 2003) yet lacks a reference to first records from Slovakia. Our article summarizes current knowledge of *S. curvatum* in the Czech Republic and Slovakia including the first record from Slovakia (1997).

Sceliphron curvatum (SMITH 1870) has settled 25 localities in 16 squares. 5 localities in 2 squares are situated in Bohemia, 7 localities in 6 squares in Moravia, 13 localities in 8 squares in Slovakia. All of the localities are antropogenous. Moreover, 17 of them (68%) are in big towns and more than one locality was recorded in the cities of Praha, Brno and Bratislava. This particular finding supports the hypothesis of synantropy of this species (BASIL-EDWARDES 1921; GEPP et BREGANT 1986; BOGUSCH et al. 2004). Figure 1 shows the distribution map of *S. curvatum* in the Czech Republic and Slovakia.

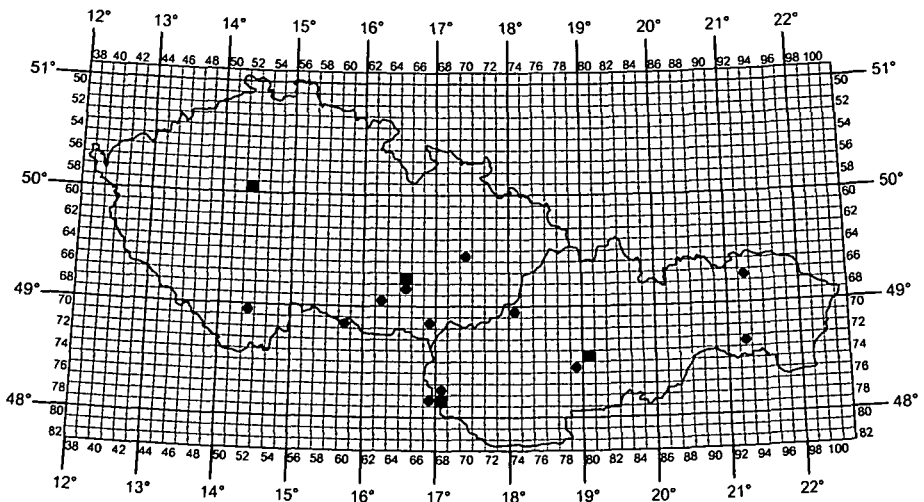


Fig. 1. Distribution map of *Sceliphron curvatum* (SMITH 1870) in the Czech Republic and Slovakia. ● – square with one locality, ■ – square with more than one locality.

Our observation of the biology of *S. curvatum* generally agrees with published data. New interesting nesting places were discovered, such as boxes with collections of minerals (locality 22) or a pile of a few years old newspapers (locality 23), both indoors. Nests in gasometer in a passage (locality 18) are also strange. Nesting on painting in a room (localities 2 and 11) and on a polystyrene board (locality 4) was already described by GEPP (1995). A lot of nests were found inside the buildings; as first described already by BASIL-EDWARDES (1921).

It is interesting that the parasite *Stilbum cyanurum* (FORSTER 1771) was found very close to the colony of *S. curvatum* in Botanical Garden Na Slupi in Prague (BOGUSCH et al. 2004; STRAKA et al. 2004). This chrysidid wasp is a cosmopolite parasite in the nests of several species of the genus *Sceliphron*. A dead specimen was found on the window in the building of the Charles University, Faculty of Science, in Viničná Street in Praha. This record may be interpreted in two ways: first, the chrysidid wasp is a parasite of *S.*

curvatum in the Botanical Garden. Second, the chrysidid wasp was accidentally brought with material of plants or animals from a foreign country and simply escaped. The latter thesis can be supported by the fact that all buildings of the Charles University, Faculty of Science are located nearby the Botanical Garden. *S. cyanurum* was published as a new species from Bohemia by BATELKA (2001). This species was never again collected in this locality. Since summer 2002, J. Straka, P. Bogusch and M. Srba have been observing *S. curvatum* females collecting humid soil for their nests along a stream in the botanical garden, but no chrysididwasp was recorded.

The Czech Republic and Slovakia entered the list of countries settled by the Asian mud dauber sphecid wasp *S. curvatum*. Presently, this species' distribution area in Europe is quite large and spreading in all directions. This species is not known from Poland (W. CELARY pers. comm.) and so it is of great interest, when the species reaches Poland because the Bardejov locality (locality 24) is less than 15 km far from the Polish border. Recently, the related species *S. caementarium* (DRURY 1773), which was brought to Europe from North America, is spreading in southern Europe and its area is by no means distant from the Czech Republic and Slovakia (STRUMIA 1996; SCHMID-EGGER 2001). In any case, further research of the biology of *S. curvatum* in Europe as well as the biology of all allochthone spreading species of animals and plants will be of use.

Zusammenfassung

Vorliegende Arbeit fasst alle Fundorte der sich ausbreitenden Mörtelwespe *Sceliphron curvatum* (SMITH 1870) in der Tschechischen Republik sowie der Slowakei zusammen. Für den zweitgenannten Staat sind dies die Erstnachweise. Die Art wurde 1979 in Europa eingeschleppt und breitet sich seit dieser Zeit in alle Richtungen aus. Zurzeit ist sie aus 12 Ländern nachgewiesen. Die Erstnachweise für die Tschechische Republik sowie die Slowakei gelangen in Devín (1997) und in Praha (2001). Derzeit sind aus 25 Orten Fundmeldungen bekannt, 12 davon aus der Tschechischen Republik, 13 aus der Slowakei. Auch auf die Biologie der Art wurde in vorliegender Arbeit eingegangen. Die Ergebnisse decken sich mit publizierten Daten anderer Länder.

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