A FAUNISTIC STUDY ON THE PSEUDOSCORPIONS (ARACHNIDA: PSEUDOSCORPIONES) OF OAK-HORNBEAM FORESTS IN SW SLOVAKIA

Jana Christophoryová*

* Department of Zoology, Faculty of Natural Sciences, Comenius University, Mlynská dolina B-1, SK–84215 Bratislava, SLOVAK REPUBLIC. E-mail: christophoryova@gmail.com

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ABSTRACT: The faunistic research on pseudoscorpions was performed at 13 study plots in the Malé Karpaty Mts. and at two study plots in Trnavská pahorkatina hills (SW Slovakia). A faunistic survey of the study area is presented in this contribution. All study plots were situated in oak-hornbeam forests; differed in altitude, mean age of forest stands, floristic composition, degree of human impact and fragmentation. The pseudoscorpions were collected by the square method combined with sifting during eight years. A total of 4051 pseudoscorpion specimens of 12 species and four families were examined during the research in the whole study area. The species *Roncus* sp. was identified only on the genus level. The species *Neobisium carcinoides* (Hermann, 1804) was common for all study plots, *Roncus* sp. and *Chernes cimicoides* (Fabricius, 1793) were found only at one study plot. From the faunistic point of view, the record of quite a rare species *Allochernes peregrinus* Lohmander, 1939 was valuable.

KEY WORDS: Pseudoscorpiones, faunistics, oak-hornbeam forest, Slovakia, Central Europe.

The oak-hornbeam forests in Slovakia used to be the most frequent forest climatic zone formation at lower altitudes. In past they covered continuous and large areas, especially in plains and lowlands from the altitude of 100 m a.s.l., in hilly and submountainous regions up to 600 m a.s.l. and in all the Inner-Carpathian hollows (Michalko et al., 1986). Most of the natural oak-hornbeam forests were transformed to very productive agricultural land; nowadays oak-hornbeam forests cover only 15 % of its natural range (Barbati & Morchetti, 2004). In Slovakia, mainly partial data on pseudoscorpions inhabiting oak-hornbeam forests were contained in several systematic faunistic and ecological papers (Krumpál & Krumpálová, 2003; Christophoryová, 2009; Christophoryová & Krumpál, 2010). Christophoryová (2010) recorded species *Neobisium carcinoides* (Hermann, 1804) and *Pselaphochernes scorpioides* (Hermann, 1804) in oak hollows. Lately, two species were recorded for the first time from Slovakia in oak and oak-hornbeam forests: *Chthonius hungaricus* Mahnert, 1980 and *Allochernes powelli* (Kew, 1916) (Christophoryová et al., 2011a,b).

Our research originated in the grant concerning animal communities in oak-hornbeam forests in SW Slovakia. Several studies of various groups of soil arthropods in this area have been already published (for example Fenďa & Ciceková, 2005; Holecová et al., 2005a,b; Krumpálová, 2005; Vrabec et al., 2012). Partial results about pseudoscorpions from the study area were published as well; containing only ecological data on assemblages and seasonal dynamics of two species (Christophoryová & Krumpál, 2005, 2007; Christophoryová & Holecová, 2012).

The aim of this study was to complete the currently unpublished faunistic data on pseudoscorpions from oak-hornbeam forest of SW Slovakia.

MATERIAL AND METHODS

The faunistic research was performed on several study plots in the Malé Karpaty Mts. and in the Trnavská pahorkatina hills during the years 1999 – 2002 and 2005 – 2008 (leg. M. Holecová, Z. Krumpálová, I. Országh).

13 study plots situated in oak-hornbeam forests were selected in the Malé Karpaty Mts. (Fig. 1):

1. Briežky (BR): 48°10' N, 17°06' E, GRN (Grid Reference Number of the Databank of the Fauna of Slovakia) 7868b, 340 m a.s.l. 80-100 years old oak-hornbeam forest belonging to *Querco petraeae-Carpinetum typicum* association; commercially used stand with managed suburban forest.
2. Cajla (CA): 48°20' N, 17°16' E, GRN 7669c, 280 m a.s.l. 80-100 years old oak-hornbeam forest of *Galio sylvaticae-Carpinetum* association; economically managed forest neighbouring with meadows and vineyards.
3. Devínska Kobyla 1 (DK1): 48°11' N, 16°59' E, GRN 7868a, 340 m a.s.l. 60-80 years old oak-hornbeam forest of the *Querco petraeae-Carpinetum melicetosum uniflorae* subassociation; a protected stand in the National Nature Reserve, very attractive for tourism.
4. Devínska Kobyla 2 (DK2): 48°10' N, 16°59' E, GRN 7868a, 300 m a.s.l. 40-60 years old oak-hornbeam forest belonging to the *Aceri-Carpinetum* association; study site situated within the National Nature Reserve.
5. Devínska Kobyla 3 (DK3): 48°11' N, 16°59' E, GRN 7868a, 452 m a.s.l. 80 years old thermophilous oak-hornbeam forest of the *Primulo veris-Carpinetum* association; study plot located in the area of the National Nature Reserve; forest is affected by tourism.
6. Dúbravská Hlavica (DH): 48°11' N, 17°00' E, GRN 7868a, 350 m a.s.l. 80-100 years old oak-hornbeam forest of the *Querco petraeae-Carpinetum typicum* association; relatively well-preserved forest.
7. Fúgelka (FU): 48°22' N, 17°19' E, GRN 7669b, 350 m a.s.l. 80-100 years old oak-hornbeam forest *Galio sylvaticae-Carpinetum* facies with *Rubus fruticosus* and *R. hirtus* (oceanic species); economically exploited forest with approx. 20 year old underplanting of *Acer pseudoplatanus* in lines due to transformation from a low forest to high-trunked forest.
8. Horský park (HP): 48°09' N, 17°05' E, GRN 7868a, 212 m a.s.l. Fragmented remnant of an 80 years old oak-hornbeam forest of the association *Querco petraeae-Carpinetum* variant with *Melica uniflora*; an isolated, fragmented forest park, strongly used by human.
9. Koliba (KO): 48°10' N, 17°06' E, GRN 7868b, 380 m a.s.l. 90-100 years old oak-hornbeam forest belonging to the *Querco petraeae-Carpinetum melicetosum uniflorae* subassociation; commercially used suburban forest.
10. Lošonec háj grove (LH): 48°28' N, 17°24' E, GRN 7570b, 260 m a.s.l. 80-100 years old oak-hornbeam forest *Querco petraeae-Carpinetum caricetosum pilosae*; Nature Reserve; economically exploited forest surrounded by closed forest complexes.
11. Lošonec lom quarry (LL): 48°29' N, 17°23' E, GRN 7570a, 340 m a.s.l. 80-100 years old oak-hornbeam forest *Querco petraeae-Carpinetum caricetosum pilosae*; economically exploited forest, intensively and systematically impacted by dust from the quarry.
12. Mlynská dolina (MD): 48°09' N, 17°04' E, GRN 7868a, 190 m a.s.l. An isolated, fragmented 80-100 years old maple-hornbeam forest of *Aceri-*

Carpinetum association; surrounded by road communication and the urban agglomeration; intensively affected by tourism and recreation.
13. Vinosady (VI): 48°19' N, 17°17' E, GRN 7669d, 280 m a.s.l. 60-80 years old oak-hornbeam forest of *Querco petraeae-Carpinetum* variant with *Poa nemoralis*; economically managed forest, former vineyard, neighbouring with drier subxerophilous meadows and shrub complexes.

Two study plots situated in oak-hornbeam forests were selected in the Trnavská pahorkatina hills (Fig. 1):

1. Horný háj grove (HH): 48°29' N, 17°27' E, GRN 7570b, 240 m a.s.l. 60-80 years old oak-hornbeam forest *Querco petraeae-Carpinetum* variant with *Melica uniflora*; economically exploited forest, former vineyard; larger complex of isolated forest surrounded by vineyards and farmland.
2. Lindava (LI): 48°22' N, 17°22' E, GRN 7670a, 240 m a.s.l. 80-100 years old oak-hornbeam forest of *Quercetum petraeae-cerris*; Nature Reserve; former economically exploited forest; large complex of island forest surrounded by fields and road.

For a detailed characteristic of the study plots (soil properties, floristic compositions, expositions, slope etc.) see Zlinská et al. (2005) and Holecová et al. (2012).

The pseudoscorpions were collected by the square method combined with sifting. At app. 1-month intervals the material was collected from the leaf litter and the upper part of soil from 16 squares at each study plot. Each square has included 25x25 cm of the area, i.e. altogether an area of 1 m^2 was sifted, representing one sample. The samples were extracted using xereclectors of the Moczarski - Winkler's type. The specimens were preserved in 80 % ethyl alcohol and were studied as permanent slide mounts. The specimens were identified using the keys of Beier (1963), Mahnert (2004) and Christophoryová et al. (2011c). The nomenclature for all taxa follows Harvey (2011). The material is deposited in the Comenius University in Bratislava, Slovakia.

Following abbreviations of all developmental stages are used in the text: ♀ – female, ♂ – male, Tn – tritonymph, Dn – deutonymph, Pn – protonymp; abbreviations of study plots vide supra.

RESULTS AND DISCUSSION

A total of 4051 pseudoscorpion specimens of 12 species and four families were examined during the research in the whole study area (Table 1). The species *Roncus* sp. was identified only on the genus level. 578 specimens of seven species were collected in Trnavská pahorkatina hills, 3473 of 11 species in Malé Karpaty Mts. (Table 1). The most specimens were recorded at study plots Koliba, Fúgelka and Lindava; the lowest amount of them at study plot Vinosady. The most species were identified from Dúbravská Hlavica. On the contrary, the lowest species number was recorded at study plot Vinosady. The species *Neobisium carcinoides* was common for all the study plots, *Roncus* sp. and *Chernes cimicoides* were found only at one study plot (Table 1).

The list of the species with examined material and their distribution is given below (abbreviations of study plots and developmental stages see in Material and methods).

Family Chthoniidae Daday, 1888

***Chthonius* (*Ephippiochthonius*) *boldorii* Beier, 1934**

Material examined: BR: 4/V/1999, 1♀, 1♂; 13/V/1999, 1♀, 1♂; 6/VI/1999, 5♀♀, 1♂; 23/IX/1999, 2♀♀, 1♂, 2Tn; 12/X/1999, 1♂; 4/IV/2000, 2♀♀, 3♂♂, 1Tn; 29/IV/2000, 8♀♀, 6♂♂, 1Tn; 9/VI/2000, 4♀♀, 4♂♂; 30/VIII/2000, 2♀♀, 1Tn; 28/IX/2000, 10♀♀, 5♂♂, 1Tn; 26/X/2000, 9♀♀, 10♂♂, 5Tn; 1/IV/2005, 3♀♀, 2♂♂; 3/V/2005, 1♀, 1♂; 4/VI/2005, 1♀; 7/X/2005, 4♀♀, 3♂♂; 17/XI/2005, 2♀♀, 2♂♂, 1Tn; 20/IV/2006, 1Tn; 24/V/2006, 1♀, 2♂♂; 3/VIII/2006, 2♀♀, 2Tn; 1/IX/2006, 1♂. **CA:** 1/VII/1999, 1♀; 14/IX/1999, 2♀♀, 1♂; 23/IV/2000, 1Tn; 12/V/2000, 1♀, 2♂♂; 31/V/2000, 1♀; 7/VII/2000, 1♂; 16/VIII/2000, 3♀♀, 4♂♂; 6/IX/2000, 1♀; 2/XI/2000, 1♀; 4/IV/2001, 1♀; 9/V/2001, 1♀; 2/VII/2001, 1♀, 1♂; 1/VIII/2001, 1♀; 18/III/2002, 1♀; 23/IV/2002, 1♂; 3/X/2002, 1♀, 2♂♂; 7/XI/2002, 1♀, 3♂♂, 1Tn. **DK1:** 17/V/1999, 1♀; 24/VII/1999, 7♀♀, 4♂♂, 5Tn; 28/IV/2000, 7♀♀, 10♂♂, 5Tn; 14/VI/2000, 7♀♀, 10♂♂, 1Dn; 26/VII/2000, 1Tn; 31/VIII/2000, 5♀♀, 7♂♂, 6Tn; 20/IX/2000, 2♂♂; 8/IV/2005, 2♀♀; 30/IV/2005, 1♂; 3/VI/2005, 5♀♀, 1Tn; 13/VII/2005, 1♀, 3♂♂; 8/X/2005, 2♂♂; 11/XI/2005, 1♂; 26/V/2006, 1♀, 1♂; 30/VIII/2006 , 1♂; 2/IX/2006, 1♂; 1/XI/2006, 1♀. **DK2:** 30/IV/1999, 2♀♀; 24/VII/1999, 2♀♀, 1♂, 3Tn; 15/X/1999, 1♂; 7/IV/2000, 1♂; 28/IV/2000, 4♂♂, 5Tn; 14/VI/2000, 8♀♀, 13♂♂; 26/VII/2000, 4♀♀, 1♂, 2Tn; 20/IX/2000, 3♀♀, 7♂♂, 4Tn, 1Dn; 3/V/2005, 3♀♀, 2♂♂; 3/VI/2005, 4♂♂; 13/VII/2005, 1♀, 1Tn; 31/VIII/2005, 1♀, 3♂♂, 1Tn; 10/X/2005, 2♂♂; 13/XII/2005, 1♀, 2Tn; 21/IV/2006, 1♀, 3♂♂, 2Tn; 31/V/2006, 2♀♀; 2/VIII/2006, 2♀♀, 1♂; 2/X/2006, 1Tn. **DK3:** 5/IV/2005, 1♀; 3/V/2005, 1♀, 4♂♂, 2Tn, 1Dn; 3/VI/2005, 7♀♀, 1♂, 2Tn; 13/VII/2005, 1♂, 1Dn; 31/VIII/2005, 5♀♀, 5♂♂, 8Tn, 1Dn; 11/X/2005, 2♀♀, 1♂, 1Tn; 13/XII/2005, 2♀♀, 2♂♂, 1Tn; 21/IV/2006, 1♂; 31/V/2006, 1Tn; 30/VI/2006, 1♀, 2Tn; 2/VIII/2006, 2♂♂, 1Tn. **DH:** 30/IV/1999, 1♂; 17/V/1999, 1♀, 1♂; 24/VII/1999, 4♀♀, 2Tn; 21/VIII/1999, 1♀; 24/IX/1999, 1♂; 15/X/1999, 1♀; 7/IV/2000, 1Tn; 28/IV/2000, 2♀♀, 9♂♂; 14/VI/2000, 17♀♀, 14♂♂; 31/VIII/2000, 3♂♂, 2Tn; 20/IX/2000, 1♂; 7/XI/2000, 1♀, 1Dn; 29/IV/2005, 1♀, 1♂, 3Tn; 3/VI/2005: 1♀, 1Tn; 19/IV/2006, 1♂; 26/V/2006, 1♀, 4♂♂, 1Tn; 2/VIII/2006, 2♀♀, 1♂, 1Tn, 1Dn; 4/I/2007, 1♂. **FU:** 27/IV/1999, 1♀; 25/V/1999, 5♀♀; 5Tn; 4/VI/1999, 2♀♀, 2♂♂, 4Tn; 1/VII/1999, 3♀♀, 1♂, 1Tn; 5/VIII/1999, 5♀♀, 1♂, 6Tn; 14/IX/1999, 11♀♀, 19♂♂, 10Tn, 3Dn; 21/X/1999, 2♀♀, 2♂♂, 2Dn; 12/V/2000, 3Tn; 7/VII/2000, 2♀♀, 5♂♂, 3Dn; 16/VIII/2000, 1♀, 2♂♂, 6Tn, 1Dn; 6/IX/2000, 3♂♂, 9Tn, 2Dn; 2/XI/2000, 1♀; 4/IV/2001, 1♀, 5♂♂, 4Tn; 9/V/2001, 1♀, 1♂, 1Tn; 6/VI/2001, 5Tn; 1/VIII/2001, 1♂, 2Tn; 11/IX/2001, 5♀♀, 2♂♂; 9/X/2001, 6♀♀, 5♂♂; 23/IV/2002, 2Tn; 14/V/2002, 1♂; 15/VII/2002, 1♀; 3/X/2002, 1♀, 1♂; 7/XI/2002, 1♂; 28/XI/2002, 4♀♀, 3♂♂, 3Tn. **HP:** 30/IV/2005, 1♀, 2♂♂; 31/V/2005, 4♀♀, 4♂♂; 29/VI/2005, 8♀♀, 8♂♂, 5Tn; 5/VIII/2005, 1Tn; 30/VIII/2005, 1♀, 2♂♂; 9/X/2005, 1♂; 12/XI/2005, 4♀♀, 1♂, 3Tn; 20/IV/2006, 2♀♀, 1♂, 1Tn; 23/V/2006, 2♀♀, 1♂; 24/VI/2006, 1♀; 3/VIII/2006, 1♀; 1/X/2006, 1♀, 1Tn; 5/XII/2006, 1♀, 1♂; 4/I/2007, 1♀, 1♂. **KO:** 4/V/1999, 2♀♀, 1♂; 18/V/1999, 2♀♀, 1♂, 1Tn; 6/VII/1999, 4♀♀, 1♂, 2Dn; 7/VIII/1999, 3♀♀; 23/IX/1999, 5♀♀, 1Tn; 12/X/1999, 5♀♀, 1♂; 4/IV/2000, 1♀, 2♂♂; 29/IV/2000, 7♀♀, 19♂♂, 7Tn; 9/VI/2000, 7♀♀, 15♂♂, 2Tn; 25/VII/2000, 4♀♀, 1Tn; 30/VIII/2000, 1♀, 2♂♂, 2Tn; 28/IX/2000, 12♀♀, 16♂♂, 2Tn, 2Dn; 26/X/2000, 8♀♀, 17♂♂, 3Tn, 1Dn; 1/IV/2005, 4Tn; 3/V/2005, 2♀♀, 2♂♂, 1Tn, 1Dn; 4/VI/2005, 8♀♀, 4♂♂, 4Tn; 13/VII/2005, 1♂, 2Tn, 1Dn; 26/VIII/2005, 1♂; 7/X/2005, 2♀♀, 3♂♂, 2Tn, 3Dn; 17/XI/2005, 1♂, 1Tn; 24/V/2006, 1♀; 1/IX/2006, 1Dn; 7/XII/2006, 1♀; 3/VI/2008, 1♂. **LH:** 12/IV/2000, 3♀♀, 1♂; 11/V/2000, 2♀♀, 1♂; 6/VII/2000, 1♀; 15/VIII/2000, 2♀♀; 5/IX/2000, 1♀; 10/V/2001, 2♀♀, 1♂; 7/VI/2001, 1♀; 2/VIII/2001, 2♀♀, 2♂♂, 1Tn; 10/IX/2001, 1♂; 12/X/2001, 2♀♀, 1♂; 16/VII/2002, 2♀♀, 1♂. **LL:** 12/IV/2000, 1♂; 5/IX/2000, 3♀♀; 3/IV/2001, 1♂; 3/VII/2001, 1♀, 2♂♂; 2/VIII/2001, 2Tn; 12/X/2001, 1♀; 13/III/2002, 1♀, 1♂; 16/VII/2002, 2♀♀, 1♂; 8/XI/2002, 2♀♀. **MD:** 8/IV/2005, 1Tn; 30/IV/2005, 2♀♀, 1♂, 1Dn; 29/VI/2005, 1♂, 4Tn; 29/VIII/2005, 2♂♂, 1Tn; 9/X/2005, 3♀♀, 1♂, 2Tn, 1Dn; 8/XII/2005, 2Tn; 22/IV/2006, 2♀♀, 2♂♂; 23/V/2006, 6♀♀, 3♂♂, 1Tn, 1Dn; 24/VI/2006, 1♀, 1Tn, 1Dn; 4/VIII/2006, 2♀♀, 2Tn; 1/IX/2006, 1♀, 2Tn; 1/X/2006, 1Tn.

HH: 12/V/2000, 1♂; 6/X/2000, 1♀; 6/VI/2001, 2♀♀, 1♂; 2/VII/2001, 1♀; 11/IX/2001, 1♀, 1♂; 19/VI/2002, 2♀♀; 7/XI/2002, 1♀. **LI:** 25/V/1999, 4♀♀, 3♂♂, 4Tn; 4/VI/1999, 2♀♀, 3♂♂, 4Tn; 1/VII/1999, 4♀♀, 7♂♂, 15Tn; 14/IX/1999, 6♀♀, 6♂♂, 3Dn; 19/X/1999, 1Tn, 1Dn; 11/IV/2000, 1♀, 1♂, 1Tn; 12/V/2000, 3♀♀, 10♂♂, 7Tn; 31/V/2000, 3♀♀; 6/IX/2000, 2♀♀, 4♂♂, 2Tn; 2/XI/2000, 1Tn, 1Dn; 4/IV/2001, 1♂, 1Tn; 9/V/2001, 1♀,

5♂♂, 5Tn; 6/VI/2001, 4♀♀, 2♂♂, 1Tn; 2/VII/2001, 2♀♀, 2♂♂, 4Dn; 1/VIII/2001, 4Dn; 11/IX/2001, 2♂♂, 1Tn, 3Dn; 9/X/2001, 6♀♀, 5♂♂, 9Tn, 6Dn; 23/IV/2002, 1♂, 4Tn, 2Dn; 14/V/2002, 4Tn; 19/VI/2002, 4♀♀, 7♂♂, 1Dn; 27/VIII/2002, 1♀; 28/XI/2002, 1♀, 2♂♂, 1Tn.

Distribution: Austria, Croatia, Germany, Italy, Slovakia (Harvey, 2011; Christophoryová et al., 2012).

Remark: This species was recorded for the first time in Slovakia exactly in Malé Karpaty Mts. and Trnavská pahorkatina hills (Christophoryová & Krumpál, 2005). Our research refers that this study area represents an appropriate locality with habitats and conditions suitable for the occurrence of stable and relatively numerous populations of *C. boldorii*.

Chthonius (*Ephippiochthonius*) *fuscimanus* Simon, 1900

Material examined: BR: 4/V/1999, 1♀, 2Tn; 6/VI/1999, 3Tn; 23/IX/1999, 2♀♀, 3♂♂, 1Tn; 12/X/1999, 1Tn; 4/IV/2000, 1♀, 2Tn; 29/IV/2000, 1♀, 4♂♂, 2Tn, 1Dn; 9/VI/2000, 1♂; 28/IX/2000, 3♀♀, 7♂♂, 5Tn, 1Dn; 26/X/2000, 1♀, 1♂, 4Tn, 3Dn; 1/IV/2005, 1♀, 4♂♂; 3/V/2005, 2Tn; 4/VI/2005, 1♀, 1♂; 26/VIII/2005, 1♀; 7/X/2005, 1♀, 1Tn, 1Dn; 17/XI/2005, 2♀♀, 2Tn; 20/IV/2006, 1Tn, 1Dn; 30/VI/2006, 1Tn; 3/VIII/2006, 2♂♂, 1Tn; 7/XII/2006, 1Tn. **DK1:** 30/IV/1999, 1♂, 1Dn; 17/V/1999, 1♂; 24/VII/1999, 3♂♂, 7Tn, 2Dn; 21/VIII/1999, 1♂; 24/IX/1999, 1Tn; 28/IV/2000, 1♀, 1♂, 2Tn, 2Dn; 14/VI/2000, 3♀♀, 2Dn; 26/VII/2000, 1♂; 31/VIII/2000, 1♀, 1♂, 2Tn; 20/IX/2000, 2♀♀, 2♂♂, 1Tn; 7/XI/2000, 1♂; 8/IV/2005, 2♂♂, 30/IV/2005, 1♂; 8/X/2005, 2♀♀; 11/XI/2005, 1♀, 1Tn; 26/V/2006, 1Tn; 30/VI/2006, 2Tn; 2/VIII/2006, 1Tn; 2/IX/2006, 1♀. **DK2:** 30/IV/1999, 1♂; 17/V/1999, 1♀; 24/VII/1999, 1♀, 1♂, 1Tn, 3Dn; 24/IX/1999, 1♂; 15/X/1999, 2♀♀, 1Tn; 7/IV/2000, 1♀, 2Tn; 28/IV/2000, 1♀, 2Tn, 1Dn; 14/VI/2000, 3♀♀, 3♂♂; 26/VII/2000, 1Tn; 31/VIII/2000, 2♂♂, 1Dn; 20/IX/2000, 1♂, 3Tn; 5/IV/2005, 1♀, 3♂♂, 3Tn, 1Dn; 3/V/2005, 2♀♀, 1♂; 31/VIII/2005, 1Tn; 10/X/2005, 2Tn; 13/XII/2005, 1Tn, 2Dn; 21/IV/2006, 1Tn, 3Dn; 31/V/2006, 1♂; 30/VI/2006, 1♀, 1Tn; 2/VIII/2006, 3♀♀; 2/IX/2006, 1♀; 9/XII/2006, 1♂. **DK3:** 5/IV/2005, 1♂; 3/V/2005, 1♀; 13/VII/2005, 1♂; 31/VIII/2005, 2♂♂, 1Tn, 1Dn; 11/X/2005, 2♀♀, 2Tn, 4Dn; 2/VIII/2006, 3♀♀, 1♂, 3Tn; 2/XI/2006, 1♂; 9/I/2007, 1Dn. **DH:** 24/VII/1999, 2♂♂, 9Tn, 1Dn; 21/VIII/1999, 1♂; 24/IX/1999, 1Tn, 1Dn; 15/X/1999, 1♀, 1♂; 7/IV/2000, 2Tn; 28/IV/2000, 5♀♀, 11♂♂, 6Tn, 2Dn; 14/VI/2000, 2♂♂, 4Tn, 2Dn; 31/VIII/2000, 1♂, 2Tn; 20/IX/2000, 1♀, 1Tn; 8/IV/2005, 1♀, 2♂♂, 3Tn; 30/VIII/2005, 2♂♂; 8/X/2005, 3Dn; 11/XI/2005, 1Tn, 6Dn; 2/VIII/2006, 1♀, 1Dn; 5/XII/2006, 1Tn; 4/I/2007, 1♂, 1Dn. **FU:** 5/VIII/1999, 1♀; 14/IX/1999, 1♂, 1Dn; 21/X/1999, 1Tn; 6/IX/2000, 1Dn; 2/XI/2000, 1Tn; 1/VIII/2001, 1Tn; 11/IX/2001, 1♂; 9/X/2001, 1Tn, 5Dn; 23/IV/2002, 1♀, 1Tn; 3/X/2002, 1♂; 28/XI/2002, 2Tn. **KO:** 4/V/1999, 1Tn; 18/V/1999, 3♀♀; 6/VII/1999, 1♀; 7/VIII/1999, 1♀, 3Tn, 1Dn; 23/IX/1999, 3♀♀, 10♂♂; 12/X/1999, 2♂♂, 1Tn; 29/IV/2000, 4♀♀, 2♂♂, 6Tn, 7Dn; 9/VI/2000, 1♀, 2♂♂, 4Tn; 25/VII/2000, 1♂, 5Tn; 30/VIII/2000, 1♀, 2♂♂, 2Tn; 28/IX/2000, 3♀♀, 4♂♂, 6Tn, 3Dn; 26/X/2000, 3♂♂, 5Tn; 4/VI/2005, 1♀; 13/VII/2005, 1♀; 26/VIII/2005, 2♂♂; 7/X/2005, 1♀, 1♂, 6Tn, 5Dn; 17/XI/2005, 1Tn; 30/VI/2006, 1Tn; 3/VIII/2006, 1♂, 1Tn; 1/IX/2006, 1♀, 1Dn; 1/XI/2006, 1♀; 5/I/2007, 2Dn; 3/VI/2008, 1Tn, 1Dn. **LH:** 12/IV/2000, 2♂♂; 30/V/2000, 1♀, 1♂; 15/VIII/2000, 2♀♀, 1♂, 1Tn; 5/IX/2000, 2♀♀, 1Tn; 2/VIII/2001, 1♂, 1Tn; 10/IX/2001, 3Tn, 1Pn; 16/VII/2002, 1Tn, 1Dn; 28/VIII/2002, 1♀; 4/X/2002, 4♂♂. **LL:** 12/IV/2000, 2♂♂; 5/IX/2000, 1♀, 2♂♂; 12/X/2001, 2♂♂; 16/VII/2002, 1Tn; 8/XI/2002, 1♀; 27/XI/2002, 1♂. **MD:** 8/IV/2005, 1♀, 1Dn; 29/VI/2005, 1♂, 3Tn, 1Dn; 29/VIII/2005, 1♀, 9Tn; 9/X/2005, 2♀♀, 3♂♂, 4Tn, 9Dn; 8/XII/2005, 1♀, 2♂♂, 2Dn; 22/IV/2006, 1Tn, 3Dn; 23/V/2006, 1Tn; 24/VI/2006, 2Tn; 4/VIII/2006, 1♂; 1/IX/2006, 1Tn, 1Dn; 1/X/2006, 1♀, 2♂♂, 3Tn, 10Dn.

Distribution: Austria, Czech Republic, Georgia, Germany, Italy, Slovakia, Turkey (Harvey, 2011; Christophoryová et al., 2012).

Chthonius (*Ephippiochthonius*) *tetrachelatus* (Preyssler, 1790)

Material examined: BR: 29/IV/2000, 1♂; 9/VI/2000, 1♂. **CA:** 25/V/1999, 1♂; 12/V/2000, 1♀, 1♂; 16/VIII/2000, 3♀♀. **DK1:** 30/IV/1999, 1♀; 26/VII/2000, 1Tn. **DK2:** 17/V/1999, 1♀; 24/VII/1999, 3♀♀; 26/VII/2000, 1♀; 31/VIII/2000, 1♀. **DH:** 17/V/1999, 1♀, 1♂; 24/VII/1999, 1♂; 14/VI/2000, 2♀♀, 1♂; **FU:** 27/IV/1999, 1♀; 25/V/1999, 2♀♀, 2♂♂; 4/VI/1999, 1♀; 5/VIII/1999, 2♀♀, 1♂, 2Tn, 1Dn; 14/IX/1999, 2♀♀, 2♂♂, 2Tn;

7/VII/2000, 7Tn, 2Dn; 16/VIII/2000, 1♀, 4♂♂; 6/IX/2000, 1♀, 1♂, 1Tn; 1/VIII/2001, 2♂♂; 11/IX/2001, 4♀♀, 2♂♂; 14/V/2002, 1♀; 15/VII/2002, 1♂; 27/VIII/2002, 2♀♀, 1♂, 1Tn. **KO:** 18/V/1999, 1♀; 23/IX/1999, 1♂; 9/VI/2000, 5♀♀, 4♂♂; 25/VII/2000, 1♂; 30/VIII/2000, 2♂♂; 28/IX/2000, 7♀♀. **LH:** 11/V/2000, 1♂; 2/VIII/2001, 2♀♀, 2♂♂. **VI:** 31/V/2000, 1♂; 7/VII/2000, 1♂, 1Dn; 1/VIII/2001, 1♂.

HH: 12/V/2000, 1♀; 31/V/2000, 2♂♂; 6/VI/2001, 1♂; 11/IX/2001, 1♀. **LI:** 26/IV/1999, 2♀♀, 1♂; 25/V/1999, 2♀♀, 1Tn; 4/VI/1999, 1♀, 4♂♂; 14/IX/1999, 5♂♂, 2Tn; 12/V/2000, 2♀♀, 2♂♂; 31/V/2000, 3♀♀, 1♂; 6/IX/2000, 1♂, 1Tn; 9/V/2001, 2♂♂; 1/VIII/2001, 1♀, 1♂, 3Tn, 1Dn; 14/V/2002, 3♀♀; 19/VI/2002, 1♂, 1Tn; 15/VII/2002, 1♀, 2Tn, 1Dn; 27/VIII/2002, 1♀.

Distribution: Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Belgium, Bulgaria, Canada, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iran, Ireland, Israel, Italy, Lebanon, Macedonia, Moldova, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Seychelles, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Turkey, Turkmenistan, U.S.A., Ukraine, United Kingdom (Harvey, 2011).

Remark: *C. tetrachelatus* often belongs to the most numerous species of the Chthoniidae family. In the study area it represented the *Chthonius* species with the lowest specimen number (Table 1).

Family Neobisiidae Chamberlin, 1930

Neobisium (*Neobisium*) *carcinoides* (Hermann, 1804)

Material examined: BR: 4/V/1999, 2♂♂; 13/V/1999, 9Tn; 6/VI/1999, 3♀♀, 4Dn, 1Pn; 23/IX/1999, 5♀♀, 3♂♂, 1Tn, 1Dn, 5Pn; 12/X/1999, 2♀♀, 2♂♂, 3Tn, 4Dn, 5Pn; 4/IV/2000, 1Tn; 29/IV/2000, 1♀, 1♂, 5Tn, 2Dn, 1Pn; 9/VI/2000, 1♀, 1Tn; 30/VIII/2000, 2Tn; 28/IX/2000, 4♀♀, 1♂, 1Tn, 2Dn; 26/X/2000, 1Tn, 14Dn; 1/IV/2005, 1♂; 3/V/2005, 5Tn; 4/VI/2005, 2Pn; 13/VII/2005, 2♂♂, 1Dn; 26/VIII/2005, 1♀; 7/X/2005, 1Tn, 2Dn, 2Pn; 17/XI/2005, 2♀♀, 3Dn, 1Pn; 20/IV/2006, 1♂; 30/VI/2006, 1♀; 3/VIII/2006, 1Dn; 1/IX/2006, 1♀, 3Dn; 1/X/2006, 1Tn. **CA:** 25/V/1999, 1♂, 6Tn, 1Dn; 4/VI/1999, 1♀, 1♂; 1/VII/1999, 4♂♂, 3Dn; 5/VIII/1999, 1♀, 5Tn, 2Pn; 14/IX/1999, 1♀, 2♂♂, 2Dn; 21/X/1999, 1♀, 1♂, 2Dn; 12/V/2000, 3♀♀, 2♂♂; 8Tn; 31/V/2000, 2♀♀, 3♂♂; 7/VII/2000, 7♀♀, 1♂, 1Tn, 9Dn; 16/VIII/2000, 5♂♂, 10Tn, 3Dn, 3Pn; 6/IX/2000, 1♀, 2♂♂, 3Dn; 6/X/2000, 1♀, 2♂♂; 2Tn, 6Dn, 1Pn; 2/XI/2000, 6♀♀, 6♂♂, 3Tn, 3Dn, 1Pn; 4/IV/2001, 1♂; 9/V/2001, 1♂, 1Tn; 2/VII/2001, 1Dn; 1/VIII/2001, 1♂, 4Tn; 11/IX/2001, 2♀♀, 2♂♂, 1Dn; 9/X/2001, 9♀♀, 13♂♂; 3Tn, 9Dn; 9/XI/2001, 3♀♀, 3♂♂, 1Tn; 18/III/2002, 1♂; 23/IV/2002, 1♀, 1Tn; 14/V/2002, 1♂, 1Tn, 1Dn; 15/VII/2002, 1♀, 1Tn; 27/VIII/2002, 3♂♂, 1Tn; 3/X/2002, 1♀, 2♂♂, 10Dn; 7/XI/2002, 3♀♀, 3♂♂, 1Tn, 3Dn; 28/XI/2002, 2♀♀, 4♂♂, 1Dn. **DK1:** 30/IV/1999, 1♀, 1Tn, 4Dn; 17/V/1999, 6♂♂, 2Tn; 24/VII/1999, 1♂, 2Tn, 1Dn, 4Pn; 24/IX/1999, 1♀, 2Dn; 15/X/1999, 1♀, 2♂♂, 1Tn, 5Dn, 4Pn; 7/IV/2000, 2♀♀, 4♂♂; 28/IV/2000, 1♀, 1Dn, 1Pn; 14/VI/2000, 1♀, 1♂, 2Tn, 2Dn, 1Pn; 26/VII/2000, 1♂, 1Tn; 31/VIII/2000, 1♂, 1Tn, 2Dn, 3Pn; 20/IX/2000, 3♀♀, 2♂♂, 1Tn; 7/XI/2000, 1Dn; 8/IV/2005, 1Tn; 3/VI/2005, 1♂; 13/VII/2005, 1♀, 2♂♂, 1Tn; 8/X/2005, 1♂, 1Tn, 7Dn; 11/XI/2005, 1Dn; 26/V/2006, 3Tn, 1Dn; 30/VI/2006, 1♂, 1Tn; 2/VIII/2006, 1♀, 2♂♂, 1Tn, 1Dn; 2/IX/2006, 1Tn; 1/XI/2006, 1Dn; 9/XII/2006, 1Pn. **DK2:** 30/IV/1999, 3♀♀, 3♂♂, 2Tn, 1Dn; 17/V/1999, 2♂♂, 4Tn, 1Dn; 24/VII/1999, 1♀, 6♂♂, 6Tn, 7Dn, 4Pn; 21/VIII/1999, 1♀, 1♂, 5Tn, 1Dn, 1Pn; 24/IX/1999, 2♀♀, 8♂♂, 1Tn, 2Dn; 15/X/1999, 2♀♀, 6Tn, 2Dn, 1Pn; 7/IV/2000, 2♀♀, 2♂♂, 5Dn; 28/IV/2000, 1♀, 4♂♂, 1Tn, 5Dn; 14/VI/2000, 5♀♀, 3♂♂, 1Tn, 4Dn; 26/VII/2000, 4Tn, 2Dn, 4Pn; 31/VIII/2000, 4♂♂, 13Tn, 2Dn, 1Pn; 20/IX/2000, 3♀♀, 4♂♂, 3Dn; 7/XI/2000, 3♀♀; 5/IV/2005, 1♂, 1Dn; 3/V/2005, 1Tn, 1Dn; 3/VI/2005, 1♂, 3Dn, 5Pn; 13/VII/2005, 2Tn, 1Dn; 31/VIII/2005, 2Dn, 2Pn; 10/X/2005, 5♀♀, 3♂♂, 1Tn, 4Dn; 13/XII/2005, 2♀♀, 3♂♂, 11Dn, 2Pn; 21/IV/2006; 1♀, 1Dn; 31/V/2006, 2Tn; 30/VI/2006, 1Dn; 2/VIII/2006, 2Dn, 1Pn; 2/IX/2006, 2Tn; 2/X/2006, 3♀♀, 2Dn; 2/XI/2006, 1♀, 1Tn. **DK3:** 5/IV/2005, 1♂, 2Dn; 3/VI/2005, 1♀, 3Tn, 3Pn; 13/VII/2005, 2Dn, 1Pn; 31/VIII/2005, 2♂♂, 1Tn, 2Dn, 4Pn; 11/X/2005, 5♀♀, 8♂♂, 1Tn, 8Dn, 3Pn; 13/XII/2005, 1♀, 1♂, 1Tn, 1Dn, 1Pn; 21/IV/2006, 2Dn, 1Pn; 30/VI/2006, 2Dn, 1Pn; 2/VIII/2006, 1♂, 1Dn, 1Pn; 2/IX/2006, 2Tn, 3Dn; 2/X/2006, 1♀; 2/XI/2006, 1♀, 1Dn; 9/XII/2006, 1♀, 3Dn, 1Pn; 9/I/2007, 1Tn, 2Dn. **DH:** 30/IV/1999, 1♂; 17/V/1999, 1♀, 1♂, 3Tn, 1Dn; 24/VII/1999, 2♀♀, 2Pn; 21/VIII/1999, 1♂, 5Tn; 24/IX/1999, 1♀, 2♂♂, 13Dn,

6Pn; 15/X/1999, 1♀, 1♂, 1Tn; 28/IV/2000, 1♂, 2Tn, 2Dn; 14/VI/2000, 1♀, 1Dn, 1Pn; 26/VII/2000, 1♂; 31/VIII/2000, 1Tn; 20/IX/2000, 1♂; 7/XI/2000, 1♀; 13/VII/2005, 1Tn, 1Dn; 11/XI/2005, 6Dn; 19/IV/2006, 1Dn; 5/XII/2006, 1♀, 1Dn, 1Pn. **FU:** 27/IV/1999, 1Tn; 25/V/1999, 2♂♂, 5Tn, 2Dn, 6Pn; 4/VI/1999, 1♀, 2Tn, 6Pn; 1/VII/1999, 2♀♀, 1♂, 1Tn, 3Dn; 5/VIII/1999, 2♀♀, 3Tn, 1Dn, 1Pn; 14/IX/1999, 2♀♀, 1♂, 1Tn, 8Dn, 4Pn; 21/X/1999, 2♀♀, 4♂♂, 7Dn, 6Pn; 31/V/2000, 1Tn, 1Dn, 1Pn; 7/VII/2000, 2Dn, 1Pn; 16/VIII/2000, 1Pn; 6/IX/2000, 1Tn, 3Dn, 17Pn; 6/X/2000, 1♂; 2/XI/ 2000, 2♀♀, 1♂, 5Dn, 1Pn; 4/IV/2001, 1♂; 9/V/2001, 3Tn; 6/VI/2001, 3Dn, 17Pn; 2/VII/2001, 1♀, 1♂; 11/IX/2001, 2♂♂, 1Dn, 1Pn; 9/X/2001, 2♀♀, 1Tn, 5Dn, 4Pn; 9/XI/2001, 2♀♀; 23/IV/2002, 1Tn; 14/V/2002, 1♂; 19/VI/2002, 1Dn; 15/VII/2002, 5Dn; 27/VIII/2002, 1Dn, 1Pn; 3/X/2002, 1♂, 1Dn; 7/XI/2002, 1Tn; 22/XI/2002, 1♂; 28/XI/2002, 1♀, 1Tn, 2Dn. **HP:** 7/IV/2005, 3♂♂, 1Tn, 2Dn; 30/IV/2005, 3♂♂, 2Dn; 31/V/2005, 4♀♀, 9♂♂, 6Pn; 29/VI/2005, 2♀♀, 8♂♂, 2Tn, 36Dn, 1Pn; 5/VIII/2005, 11Tn; 30/VIII/2005, 4♂♂, 1Tn, 2Dn; 9/X/2005, 11♀♀, 13♂♂, 10Tn, 13Dn; 12/XI/2005, 3♀♀, 3♂♂, 6Tn, 10Dn; 20/IV/2006, 1♀, 1Tn, 4Dn; 23/V/2006, 4♂♂, 1Tn, 3Dn; 24/VI/2006, 3Tn, 3Pn; 3/VIII/2006, 2Tn, 2Dn; 1/IX/2006: 1Tn; 1/X/2006: 4♂♂, 1Tn; 1/XI/2006, 1♀, 2♂♂, 1Tn; 5/XII/2006, 3♀♀, 1♂, 1Tn; 4/I/2007, 1Dn. **KO:** 4/V/1999, 2Tn; 18/V/1999, 3Tn, 1Dn; 6/VII/1999, 5Dn; 7/VIII/1999, 2Tn; 23/IX/1999, 2♀♀, 4♂♂, 3Tn, 3Dn, 1Pn; 12/X/1999, 2♂♂, 3Dn, 2Pn; 4/IV/2000, 1Tn; 29/IV/2000, 1♀, 2Dn; 9/VI/2000, 2Tn, 2Dn, 2Pn; 25/VII/2000, 2♀♀, 1♂, 4Tn, 3Dn; 30/VIII/2000, 1♂; 28/IX/2000, 1Pn; 26/X/2000, 3♀♀, 3♂♂, 12Dn; 1/IV/2005, 3Dn, 1Pn; 3/V/2005, 3Tn, 1Dn; 4/VI/2005, 3Pn; 13/VII/2005, 1♀, 6♂♂, 2Tn; 26/VIII/2005, 2♀♀, 2♂♂; 2Tn, 1Dn, 5Pn; 7/X/2005, 3♀♀, 10♂♂, 1Tn, 40Dn, 17Pn; 17/XI/2005, 1♂, 8Dn, 2Pn; 20/IV/2006: 1♀, 1Tn, 1Dn; 24/V/2006, 1♂, 2Tn, 1Pn; 30/VI/2006, 1Tn; 3/VIII/2006, 1♂, 3Pn; 1/X/2006, 2♀♀, 3Dn; 1/XI/2006 , 2♀♀, 1♂, 1Dn, 2Pn; 7/XII/2006, 1Tn, 2Dn; 5/I/2007, 1Dn; 3/VI/2008: 1Pn. **LH:** 12/IV/2000, 2♂♂, 1Tn; 11/V/2000, 1♂, 3Tn; 6/VII/2000, 1Dn; 15/VIII/2000, 1♂; 5/X/2000, 3♀♀, 2♂♂; 2/VIII/2001, 1Tn; 10/IX/2001, 1♂, 1Tn; 12/X/2001, 1♂, 1Dn; 8/XI/2001, 2♀♀; 13/III/2002, 1♂; 18/VI/2002, 1♀, 7Dn; 28/VIII/2002, 2Tn; 4/X/2002, 2♀♀, 6♂♂; 8/XI/2002, 1♀, 1♂; 27/XI/2002, 1♀. **LL:** 5/X/2000, 1Dn; 10/V/2001, 1Dn; 3/VII/2001, 1♀, 2Tn; 2/VIII/2001 , 4Tn; 12/X/2001, 1Dn; 8/XI/2001, 1♂; 13/III/2002, 1Tn; 13/V/2002, 1Tn; 16/VII/2002, 1Tn, 1Dn; 8/XI/2002, 2♂♂, 1Tn. **MD:** 30/IV/2005, 1♂; 29/VI/2005, 1♂, 2Dn; 29/VIII/2005, 1♂, 2Tn, 1Dn, 2Pn; 1/IX/2005, 5Dn, 1Pn; 9/X/2005, 3♀♀, 5♂♂, 3Tn, 6Dn, 5Pn; 8/XII/2005, 2♀♀, 4♂♂, 2Tn, 2Dn; 22/IV/2006, 1Tn, 3Dn; 23/V/2006, 1Pn; 24/VI/2006, 2♀♀, 9Dn, 4Pn; 4/VIII/2006, 1♀, 5Tn, 7Pn; 1/IX/2006, 1Dn; 1/X/2006, 1♂, 1Tn, 3Dn; 6/XII/2006, 4♀♀, 1♂, 3Tn, 2Dn; 7/I/2007, 1♀, 1♂. **VI:** 25/V/1999, 4♀♀, 1♂, 1Tn, 2Dn, 1Pn; 4/VI/1999, 3♀♀, 2♂♂, 1Pn; 1/VII/1999, 4Tn; 12/V/2000, 2♂♂, 1Tn; 31/V/2000, 2♀♀, 1Tn, 1Dn; 7/VII/2000, 1♂; 2/XI/2000, 2♀♀; 4/IV/2001, 1♂; 9/V/2001, 1♂, 1Tn; 6/VI/2001, 1Tn; 1/VIII/2001, 1♂, 2Tn; 11/IX/2001, 2Dn; 9/XI/2001, 1♀, 1♂, 18/IV/2002, 3♂♂; 14/V/2002, 3♂♂, 1Tn; 16/VII/2002, 1Tn, 2Dn; 27/VIII/2002, 1♂, 2Tn.

HH: 12/V/2000, 2♂♂; 31/V/2000, 1♀, 1♂; 6/X/2000, 2♂♂; 4/IV/2001, 1♂; 9/V/2001, 1Tn; 6/VI/2001, 1♀; 2/VII/2001, 3Dn; 11/IX/2001, 1♀, 1Tn, 3Dn; 9/X/2001, 1♂, 1Dn; 9/XI/2001, 1♂; 3/X/2002, 1♂, 1Dn; 7/XI/2002, 1♀, 1♂, 1Tn, 1Dn. **LI:** 26/IV/1999, 3Tn, 3Dn; 25/V/1999, 3Tn, 4Pn; 4/VI/1999, 3♀♀, 2Tn, 7Pn; 1/VII/1999, 13Dn; 5/VIII/1999, 1Pn; 14/IX/1999, 1Tn, 2Dn, 1Pn; 19/X/1999, 4♀♀, 1♂, 1Tn, 5Dn, 4Pn; 11/IV/2000, 2Tn, 1Dn, 1Pn; 12/V/2000, 6Tn; 31/V/2000, 2♀♀, 1Pn; 16/VIII/2000, 1Tn; 6/IX/2000, 1♀, 2♂♂, 2Tn, 3Dn, 8Pn; 2/XI/2000, 2♂♂, 1Tn, 9Dn, 1Pn; 4/IV/2001, 2Dn, 1Pn; 9/V/2001, 1♂, 2Tn, 4Dn; 6/VI/2001, 1♂, 2Pn; 2/VII/2001, 1♂, 11Dn; 1/VIII/2001, 5Tn; 11/IX/2001, 2♀♀, 1♂, 3Tn; 9/X/2001, 1♂, 1Tn, 7Dn; 9/XI/2011, 6♀♀, 1♂, 2Tn, 1Dn; 18/III/2002, 1♀, 2Dn; 19/VI/2002, 1Tn, 1Pn; 15/VII/2002, 3Dn; 3/X/2002, 2Dn; 7/XI/2002, 2♀♀, 1♂; 28/XI/2002, 1Tn, 4Dn, 1Pn.

Distribution: Algeria, Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, India, Ireland, Italy, Kazakhstan, Kenya, Latvia, Luxembourg, Macedonia, Montenegro, Morocco, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tunisia, Ukraine, United Kingdom (Harvey, 2011).

Remark: *N. carcinoides* is considered to be eurytopic, mainly epigeic species and often the most common species of the family of Neobisiidae (Beier, 1963; Christophoryová, 2009).

***Neobisium* (*Neobisium*) *carpaticum* Beier, 1935**
Material examined: CA: 25/V/1999, 2Tn; 1/VII/1999, 1♂; 12/V/2000, 4Tn; 7/VII/2000, 1♂; 16/VIII/2000, 4♂♂; 6/IX/2000, 3♀♀, 1♂, 2Pn; 9/V/2001, 1♂; 9/XI/2001, 1♀; 27/VIII/2002, 1Pn; 3/X/2002, 1Pn. **DK1:** 30/IV/1999, 1Pn; 17/V/1999, 1Tn; 24/IX/1999, 1♂, 1Dn; 31/VIII/2000, 1Pn. **DK3:** 11/X/2005, 2♂♂, 4Dn; 13/XII/2005, 1Tn, 2Dn; 2/X/2006, 2♀♀; 9/XII/2006, 1Dn. **DH:** 14/VI/2000, 1♂; 20/IX/2000, 1♀; 7/XI/2000, 1♀. **FU:** 27/IV/1999, 1Dn; 1/VII/1999, 1♂, 1Tn; 5/VIII/1999, 1♀, 1♂; 14/IX/1999, 1♀, 3♂♂, 4Dn, 2Pn; 21/X/1999, 1♂; 6/IX/2000, 8Pn; 6/X/2000, 1♀, 1Dn; 2/XI/ 2000, 1Tn, 5Dn, 2Pn; 2/VII/2001, 1Tn; 1/VIII/2001, 1♂; 11/IX/2001, 1♂; 9/X/2001, 1♂, 1Tn, 4Dn, 1Pn; 9/XI/2001, 1Dn; 23/IV/2002, 1♀; 14/V/2002, 1Tn; 15/VII/2002, 1♂; 27/VIII/2002, 1Pn; 3/X/2002, 1Tn, 1Dn. **LH:** 12/IV/2000, 2Dn; 11/V/2000, 4Tn; 5/X/2000, 1♀, 1♂; 3/XI/2000, 2♂♂; 10/V/2001, 1Tn; 2/VIII/2001, 1Tn; 10/IX/2001, 1♀, 1♂; 18/VI/2002, 1♀; 4/X/2002, 1♂; 8/XI/2002, 1♀, 1Tn; 27/XI/2002, 2Tn, 1Dn. **LL:** 12/IV/2000, 1♀, 1♂; 11/V/2000, 1Tn; 5/IX/2000, 1♂; 5/X/2000, 1♂, 1Dn; 3/IV/2001, 1♂; 10/V/2001, 1Tn; 7/VI/2001, 1♀; 3/VII/2001, 1Tn; 2/VIII/2001, 1♀, 1♂, 1Pn; 10/IX/2001, 1Pn; 12/X/2001, 2♂♂, 2Dn; 13/III/2002, 1♀, 1Dn; 22/IV/2002, 1Tn; 16/VII/2002, 3♂♂; 8/XI/2002, 1♂, 1Pn; 27/XI/2002, 1♀, 2Dn.
HH: 16/VII/2002, 1♂. **LI:** 26/IV/1999, 1♂, 3Tn.
Distribution: Poland, Romania, Serbia, Slovakia (Harvey, 2011).
Remark: Some specimens were previously misidentified as *Neobisium erythrodactylum* (L. Koch, 1873), all misidentification were corrected in Christophoryová et al. (2012).

***Neobisium* (*Neobisium*) *sylvaticum* (C.L. Koch, 1835)**
Material examined: DK2: 24/IX/1999, 1♂; 26/VII/2000, 1Dn. **DH:** 26/V/2006, 1Tn; 8/X/2005, 1Dn. **HP:** 7/IV/2005, 1♂; 29/VI/2005, 1Dn; 3/VIII/2006, 1Tn; 1/IX/2006, 2Tn.
Distribution: Albania, Armenia, Austria, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, France, Georgia, Germany, Greece, Hungary, Italy, Moldova, Montenegro, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Switzerland, Turkey, Ukraine (Harvey, 2011).

***Roncus* sp.**
Material examined: HH: 6/VI/2001, 2Tn; 16/VII/2002, 1♂.
Remark: This species was previously identified as *Roncus lubricus* L. Koch, 1873. The application of the karyological methodology approach and molecular data has recently enabled to recognize a cryptic species in this genus in Slovakia (Christophoryová & Šťáhlavský, 2012). As long as the detailed redescription will not be done, the accurate identification is impossible.

Family Cheliferidae Risso, 1826
***Dactylochelifer latreillii* (Leach, 1817)**
Material examined: DK1: 26/V/2006, 1Tn. **MD:** 29/VI/2005, 1Dn; 6/XII/2006, 1♀.
Distribution: Albania, Algeria, Armenia, Austria, Azerbaijan, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Georgia, Germany, Greece, Hungary, Iran, Italy, Kazakhstan, Netherlands, Poland, Portugal, Romania, Serbia, Slovakia, Spain, Sweden, Tunisia, Ukraine, United Kingdom (Harvey, 2011).

Family Chernetidae Menge, 1855
***Chernes cimicoides* (Fabricius, 1793)**
Material examined: DK3: 5/IV/2005, 1♀.
Distribution: Armenia, Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Kazakhstan, Latvia, Netherlands, Norway, Poland, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Turkey, United Kingdom (Harvey, 2011).

***Chernes similis* (Beier, 1932)**
Material examined: DK3: 3/VI/2005, 1♀, 1♂. **DH:** 8/X/2005, 1Tn.
HH: 11/IX/2001, 1♀, 1♂, 1Tn, 1Dn; 16/VII/2002, 31♀♀, 45♂♂, 5Tn, 25Dn.

Distribution: Austria, Bulgaria, Czech Republic, Hungary, Macedonia, Montenegro, Poland, Romania, Slovakia, Turkey (Harvey, 2011; Novák, 2012).
Remark: This species was the most numerous one from the family of Chernetidae (Table 1). 110 specimens were found only at the study plot Horný háj, where the leaf litter containing high amounts of dead wood was sifted.

Allochernes peregrinus Lohmander, 1939

Material examined: BR: 1/IV/2005, 1Dn. **CA:** 25/V/1999, 1♀. **DK3:** 3/V/2005, 1Tn. **DH:** 26/V/2006, 3♀♀.
Distribution: Austria, Czech Republic, Germany, Hungary, Poland, Slovakia, Switzerland, Sweden, U.S.A. (DeVore-Scribante, 1999; Harvey, 2011).
Remark: From the faunistic point of view, the record of this species is valuable; it is a rare species listed in the Red Data Book of the Czech Republic as vulnerable (Šťáhlavský & Ducháč, 2005).

Pselaphochernes scorpioides (Hermann, 1804)

Material examined: CA: 4/VI/1999, 1♀; 9/V/2001, 1♂. **DK1:** 14/VI/2000, 1♀. **DK2:** 10/X/2005, 1♀. **DH:** 28/IV/2000, 1Dn; 14/VI/2000, 4Tn. **FU:** 4/VI/1999, 1Dn; 6/VI/2001, 1♂; 23/IV/2002, 1♂. **HP:** 30/IV/2005, 1♂. **LH:** 5/IX/2000, 1♀, 2♂♂; 3/XI/2000, 1♀; 3/VII/2001, 1♀, 1♂, 2Tn; 13/III/2002, 1♀. **LL:** 5/IX/2000, 1♀, 2♂♂; 10/V/2001, 3♀♀; 7/VI/2001, 1♀; 3/VII/2001, 3♀♀; 13/III/2002, 1Tn; 22/IV/2002, 4♀♀, 1Dn; 18/VI/2002, 1♂; 28/VIII/2002, 3♀♀, 1♂; 27/XI/2002, 3♀♀, 1Tn.
HH: 12/V/2000, 1Tn; 9/V/2001, 1♀. LI: 12/V/2000, 1♀, 1♂; 9/V/2001, 1♀; 15/VII/2002, 1♀.
Distribution: Algeria, Armenia, Austria, Azerbaijan, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iran, Ireland, Israel, Italy, Latvia, Lebanon, Morocco, Netherlands, Norway, Pakistan, Poland, Portugal, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Syria, Turkey, U.S.A., Ukraine, United Kingdom, Uzbekistan (Harvey, 2011).

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Table 1. List of the pseudoscorpion species and numbers of specimens collected at individual study plots in Malé Karpaty Mts. and Trnavská pahorkatina hills.

	Study plots															
Species	**BR**	**CA**	**DK1**	**DK2**	**DK3**	**DH**	**FU**	**HP**	**KO**	**LH**	**LL**	**MD**	**VI**	**HH**	**LI**	**Total**
C. boldorii	117	34	99	95	57	83	179	60	207	27	18	48		11	191	1226
C. fuscimanus	74		51	62	24	79	19		115	24	10	66				524
C. tetrachelatus	2	6	2	6		6	49		21	5			4	5	46	152
N. carcinoides	119	225	100	217	77	66	174	206	215	43	18	99	53	26	175	1813
N. carpaticum		22	5		12	3	51			21	29			1	4	148
N. sylvaticum				2		2		5								9
Roncus sp.														3		3
D. latreillii			1									2				3
C. cimicoides					1											1
C. similis					2	1								110		113
A. peregrinus	1	1			1	3										6
P. scorpioides		2	1	1		5	3	1		9	25			2	4	53
Total	313	290	259	383	174	248	475	272	558	129	100	215	57	158	420	4051

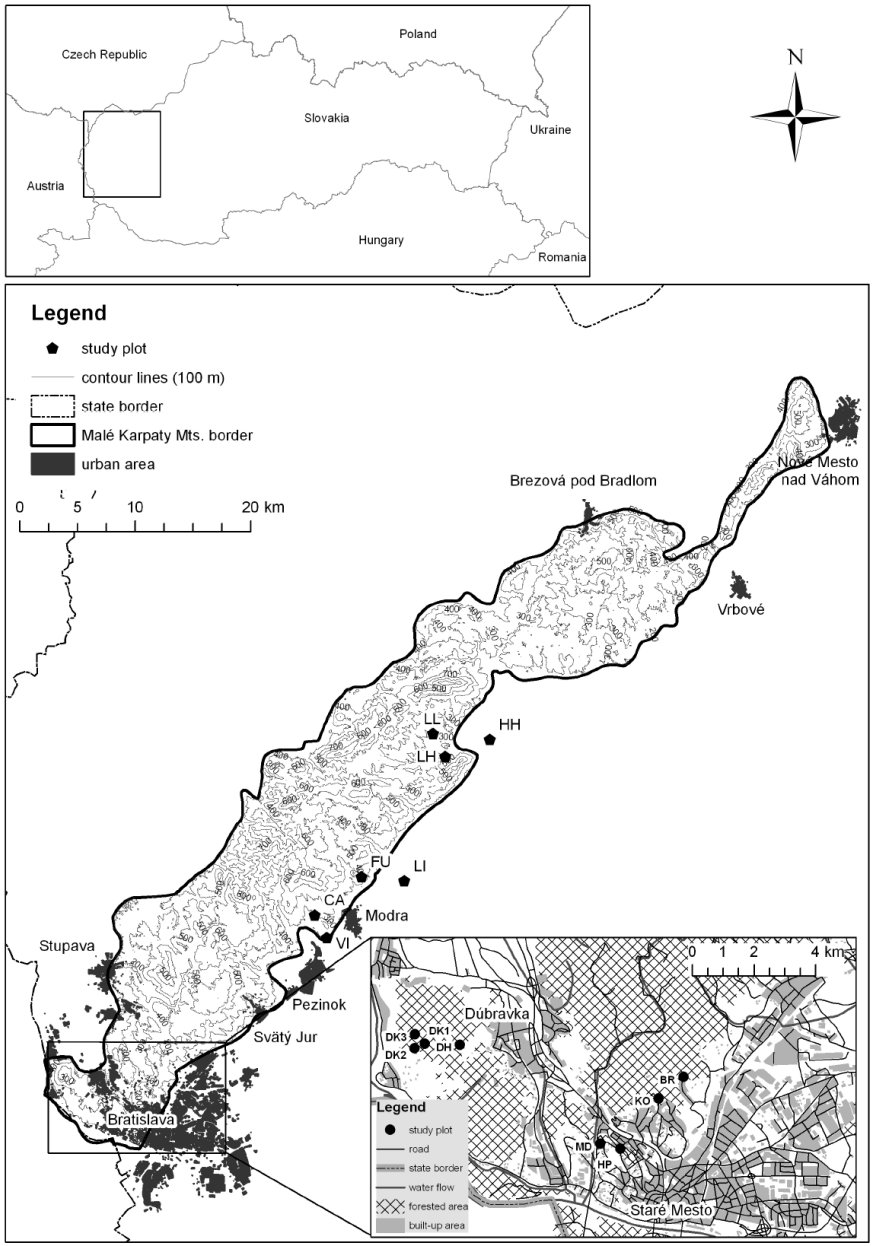

Figure 1. Study area of the Malé Karpaty Mts. and Trnavská pahorkatina hills with the position of all the study plots (design: Juraj Holec).