

## New and Remarkable Findings of Spiders (Araneida) in Slovakia and their Ecosozological Value

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**Abstract:** This paper describes the distribution and ecology of several rare spiders (Araneida) in Slovakia. Ten of them: *Centromerus laevitarsis*, *Hylaphantes graminicola*, *Leptophantes midas*, *Micrargus georgescuae*, *Taranucus setosus*, *Kratochviliella bicapitata*, *Troxochrus nasutus*, *Hahnia picta*, *Cheiracanthium campestre* and *Diaeä pictilis* are the first records for Slovakia. Many of the spiders rank among rare, relict, faunistically and zoogeographically remarkable species of a high level of endangerment. A scheme for spider endangerment evaluation and an outline of the ways in which the improvement of their conservation could be achieved are included.

### INTRODUCTION AND METHODS

Spiders rank among less popular groups of animals. They are mostly considered to be unpleasant and "omnipresent" organisms, and almost nobody has seriously dealt with their endangerment as a consequence of various kinds of anthropic activity. This fact is reflected in so-called red lists throughout the European countries. Spiders are totally overlooked in one half of the accessible European red lists: they are missing in the red list of the former USSR (Borodin et al., 1985), Russia (Elisejev et al., 1983), Belorussia (Dolyk, Kazlovskaja et al., 1993), Lithuania (Balevičius et al., 1992), but also of Poland (Glowacinski et al., 1992), Hungary (Rakonczay et al., 1990), France (WWF, 1994), Danmark (Asbjørk, Sogaard et al., 1991) and Norway (Skauge et al., 1992). Moreover, spiders are not mentioned in the IUCN Invertebrate Red Data Book (Wells, Pyle & Collins, 1983). In the red list of Austria (Gepp, 1983) and of the whole Europe (ECE, 1991) only isolated notes on several spider species are available. More or less serious attention to spiders is paid only in the red list of the former Czechoslovakia (Škapec et al., 1992), Slovakia (Gajdoš & Svatoň, 1993; Gajdoš, 1995), Germany (Harms, 1984),

Italy (Groppali, Priano et al., 1993), Finland (Rassi et al., 1992), Sweden (Ehnström, Gärdenfors & Lindelöw, 1993) and of Great Britain (Merrett, 1991). Annotated checklist of spiders has been published in Bohemia (Buchar, 1992b). Although it is not a standard red list, the abundance of separate species is commented here; the least frequent species are specified as "rare".

The last eight red lists referred to prove that many spiders rank among vulnerable or even endangered species. There are often sporadic and rare species of a narrow ecological amplitude. But the knowledge concerning the distribution and ecology of spiders in the territory of Slovakia is not thorough; systematic arachnologic research is just developing in our country.

In this paper, we would like to make a contribution to the knowledge concerning the distribution, ecology and conservational questions of several rare spider species in Slovakia; ten of them have been documented here for the first time. Our research was carried out during the last 5 years. We applied current methods of collecting, especially individual collecting under the bark of trees and under stones, sieving of litter and detritus, shaking down the spiders from tree branches and using sweep-nets. The material was determined according keys by Miller (1971) and by Heimer & Nentwig (1991). Finally we would like to thank Dr. Gajdoš who reviewed the majority of the spiders.

### Ecosozological problems of spiders

In the mentioned red lists there are no evaluative systems for spider endangerment assessment. Therefore we have tried to modify the ecosozological evaluation system worked up by Franc (1992) and by Jedlička et al. (1994). The ecosozological index of every species is given by a sum up to nine numbers in the following evaluative points.

#### ECOSOZOLOGICAL INDEX EVALUATIVE SCHEME

##### I. Distribution

1. The whole range:
  - cosmopolitan or near cosmopolitan ..... 0
  - species of a large range (Palaearctic and wider) ..... 1
  - species of a lesser range (Eurosiberian, etc.) ..... 2
  - species of a local range (Central Europe, etc.) ..... 3
  - endemic or relict species ..... 5
2. The situation of Slovakia in relation to the range:
  - inside of the range ..... 0
  - at a border of the range ..... 2
  - outside of the continual range of occurrence ..... 4
3. The occurrence in the territory of Slovakia:
  - wide spread species found almost throughout the country ..... 0
  - species which occurs in a lesser part of Slovakia ..... 1

– species which occurs only in some regions .....	3
– it occurs insularly only in a few isolated places .....	5

## II. Abundance

1. The abundance:	
– very frequent species .....	0
– frequent species .....	1
– less frequent species .....	2
– infrequent (relatively rare) species .....	3
– rare species .....	4
– the rarest species .....	5

2. The trend in the last decades:	
– abundance is increasing .....	0
– abundance is more or less stable .....	1
– abundance decrease is perceivable .....	2
– clearly retreating species .....	4
– rapidly disappearing species, which have already become extinct in some areas .....	6

## III. Ecology

1. The biotopic amplitude:	
– euryoecious or near euryoecious species .....	0
– species of less biotopic claims .....	2
– species of narrow biotopic claims .....	4
– specialized species of a very narrow biotopic amplitude .....	6

2. The mobility of the species, abilities and possibilities to spread to new biotopes:	
– high .....	0
– average .....	2
– limited or very low .....	4

## IV. Anthropic factors of protection

1. The trend of biotopic interference:	
– is improving .....	0
– is more or less stable .....	1
– biotopes are interfered without major changes .....	2
– biotopes are highly interfered .....	4
– biotopes are liquidated .....	6

2. A protection assurance from man's side:	
– the species is well known among arachnologists (and partially among conservationists), it ranks (or it has a chance to rank) among protected species; the data concerning its endangerment and ways of protection are available (in red lists, etc.) .....	0
– the species is little known and we cannot state the preceding facts in this case .....	1

We can use the following hierarchic system of endangerment categories in the practice:

0- 7 .....	adaptable, little vulnerable (ALV)
8-14 .....	contemporarily non-endangered (CNE)
15-21 .....	potentially endangered (PE)
22-28 .....	actually endangered (AE)
29-35 .....	highly endangered (HE)
36 and more .....	critically endangered (CE)

## Results (Systematic review of species)

The following abbreviations (except those mentioned above and the current ones) are used in this paper: E – endangered; ESI – ecosozological index; ESS – ecosozological status; Ex – extinct; f. – female; G – ‘gefährdet’ in Germany, it means R according to IUCN; I – indeterminate; juv. – juvenile; m. – male; NR – nature reservation; PE – ‘potentiell gefährdet’ in Germany, it means CD (care demanding) according to IUCN; R – rare; sad. – subadult; SG – ‘stark gefährdet’ in Germany, it means V according to IUCN; V – vulnerable.

The grid mapping code of every locality is given only the first time the locality is mentioned..

### Atypidae

*Atypus muralis* (Bertkau, 1890) – Turá (7877), the sandy-and-clayish terrace near the Hron river, 3 June 1989, 1 sad. m. (Gajdoš rev.). It occurs very locally and rarely on the warmest grasslands and xerothermic slopes. Only several records are available: Súľovské skaly (6877) (Miller & Svatoň, 1974); NR Kečovské škrapy (7588) (Gajdoš, in litt.) and NR Zoborská lesostep (7674) (Gajdoš & Krumpál, 1987). ESS: Poland – R, the former ČSFR – E, Bohemia – R, Slovakia – V (Gajdoš & Svatoň, 1993) or E (Gajdoš, 1995). ESI: 225526440; 30 – HE!

### Scytodidae

*Scytodes thoracica* (Latreille, 1804) – Štúrovo: Hegyfarok (8178) under a stone on the xerothermic steppe grassland, 2 May 1992, 1 m; Hajnáčka: NR Pohanský hrad (7785d), under a stone on the border of a xerothermic oak forest, 17 Aug. 1995, 1 sad. f. It occurs sporadically as a synanthropic species, but also rarely in the warmest biotopes under stones. Only a few findings made out of cities are available: Miloslavov (7969), in pine forest (Gajdoš, Svatoň, Žitňanská & Krumpálová, 1992); NR Devínska Kobyla (7867) (Žitňanská, 1980); Slovenské Nové Mesto (7596) (Chyzer & Kulczynski, 1891). It is missing in accessible red lists. ESI: 223412220; 18 – PE.

### Dysderidae

*Dasumia (= Harpactea) carpathica* (Kulczynski, 1882) – Veľká Fatra Mts.: Pekárova (7079), mountain rocky steppe, 29 Sept. 1994, 1 f. (Gajdoš rev.) and 28 May 1994, 1 m. It occurs very rarely under stones in mountain localities. Only a few records are available: Hradisko near Žilina (6778) and Hričov (6777) (Bartoš, 1938; Miller & Kratochvíl, 1940a); NR Starhrad (Bartoš, 1938; Svatoň, 1984), Žilina (6778) (Miller, 1971). Records from NR Šúr (7769) (Jedličková, 1988) and from alluvial ecosystems of the Malý Dunaj river near Vrakuňa (7869) (Gajdoš et al., 1992) are surprising and they

widen the knowledge on the ecology of this species. (But it is not improbable that it was washed down by water streams from mountain altitudes.) ESS: Slovakia – V. ESI: 403513221; 21 – PE.

#### Segestriidae

*Segestria bavarica* C. L. Koch, 1843 – Košecké Podhradie: NR Podhradská lesostep (7075), limestone xerothermic slope, 29 April 1993, 1 sad. f. (Gajdoš rev.). It occurs very rarely in warm rocky biotopes. The following records are known: Plešivská Planina: Vidová and Veľký vrch (7488), rocky steppe (Svatoň & Majkus, 1988), Súľovské skaly (Bartoš, 1938), Vtáčnik Mts.: NR Veľká skala (7377b) (Gajdoš, 1991a), NR Devínska Kobyla (Gajdoš, in litt.) and NR Turecký vrch (7273) (Gajdoš, 1986b). ESS: Germany – G, Sweden, Bohemia and Slovakia – R. ESI: 304513220; 20 – PE.

#### Uloboridae

*Uloborus walckenaerius* Latreille, 1806 – Kováčovce: Hradište (7882), xerothermic sandy grassland, 3 July 1989, (Svatoň rev.), 15 April 1990, 1 f. and 29 May 1993, 1 f.; Medovarce (7779d), xerothermic rocky slope, 13 May 1996, 1 f.; Plášťovce (7879b), xerothermic rocky slope, 16 June 1996, more than 50 specimens! It can be found on the warmest xerothermic localities of well-preserved areas. Additional records are available: Čabradský Vrbovok (7780) and Plášťovce (Vachold, unpublished), Štúrovo (8278) and Chotín (8175) (Miller, 1971), Lučenec (7683) (Malesevics, 1891), Čenkov (8277) (Buchar, 1995; Kůrka, 1994), Stará Bašta (7885) (Antuš, unpublished), Krivín (7677) (Gajdoš, 1992), Borová (7467) (Gajdoš, in litt.). It often lives on sandy grasslands. ESS: Germany – G, the former ČSFR – E, Great Britain and Slovakia – R. ESI: 225524230; 25 – AE.

#### Linyphiidae

*Centromerus albidus* Simon, 1929 – Hajnáčka: NR Pohanský hrad, pseudokarst 'Nyári' cave, 21 April 1995, 2 f. and 29 May, about 10 f. (Gajdoš and Svatoň rev.); Cerová vrchovina Mts.: Steblová skala (7785d), under deeply located stone in a xerothermic oak forest, 6 May 1995, 1 f. It occurs very locally and mostly rarely in the warmest places, but apparently prefers colder underground microbiotopes. Its pale, light yellow colouration confirms that it is a typical subterranean species. Known only from two records: Kováčovské kopce (8178d) (Miller, 1971) and NR Zobor, 13 April 1978, 1 f. (Gajdoš, 1985). ESS: Slovakia – R, Great Britain – V. ESI: 205416421; 25: AE.

*Centromerus capucinus* (Simon, 1884) – Zvolen: Poštárka (7480), in the litter on a xerothermic rocky slope, 27 Febr. 1994, 3 f. (Gajdoš rev.). It occurs sporadically and rarely in warm biotopes. Known only from Urpín (Svatoň, 1985a). ESS: Bohemia – R, Slovakia – V. ESI: 224424231; 24 – AE.

*Centromerus laevitarsis* (Simon, 1884) – NR Klinské rašelinisko (6582), in wet moss (*Sphagnum*) 30 June 1994, 1 f. (Gajdoš rev.). The second specimen was found in a wetland near Moravský Ján (7468), Gajdoš lgt. et coll. These are the first records for the Slovak territory. Known from Western and Central Europe, but it always occurs very locally and rarely (Heimer & Nentwig, 1991). ESS: Germany – G, Great Britain – V, Bohemia – R, Slovakia – E. ESI: 225526441; 31 – HE.

*Cineta gradata* (Simon, 1881) – Kremnické vrchy Mts.: Lávrín (7380a), in the litter of ancient beech-and-fir forest, 8 July 1995, 1 m. (Gajdoš and Svatoň rev.). A very sporadic and rare species, known only from one finding: Slovenský raj Mts.: Klauzy (7188a) (Žitňanská, 1987a). ESS: Slovakia – E. ESI: 305524231; 25 – AE.

*Hylyphantes* (= *Erigonidium*) *graminicola* (Sundewal, 1829) – Námestovo (6582), on the vegetation on the bank of 'Oravská priehrada' dam (6582) 1 July 1994, 1 m (Gajdoš rev.). A rare species found scattered on lower vegetation (often near water) in Europe (Heimer & Nentwig, 1991). This is the first record for Slovakia. It is missing in accessible red lists. ESI: 204423231; 21: PE, or up to AE.

*Kratochviliella* (= *Pelecopsis*) *bicapitata* (Miller, 1938) – Hajnáčka: NR Pohanský hrad, in the same biotope as *Metopobactrus rayi*, 21 April 1995, 2 m. and 1 f. (Gajdoš rev.) and 29 May 1995, 5 f. These are the first records for Slovakia. Known from Central Europe (Heimer & Nentwig, 1991). It had been considered to be a very rare species (Miller, 1971), because its bionomy is hidden; on the other side it ranks among the relict and vulnerable species in all cases and its locality deserves strict protection. ESS: Bohemia – R. ESI: 545516411; 32 – HE.

*Leptyphantes midas* Simon, 1884 – Banská Bystrica, in a hollow beech on the Urpín hill, 10 Oct. 1992, 1 f. (Gajdoš rev.); Poľana Mts. – Žiarec (7382), in a hollow oak occupied by wood-mouse (*Apodemus*), 25 Sept. 1994, 1 f. (Gajdoš rev.). Known from Great Britain and France (Heimer & Nentwig, 1991) and from Moravia (Růžička & Boháč, 1991). These are the first records for Slovakia. It is considered to be a relict species living in tree cavities of the best preserved biotopes (Růžička & Boháč, 1991). ESS: Great Britain – V, Slovakia – E. ESI: 204526231; 25 – AE.

*Metopobactrus ascitus* (Kulczynski, 1894) – NR Čenkovská lesostep (8277), 1 May 1994, 1 f. (Gajdoš rev.). It occurs sporadically and rarely in warm biotopes. Only a few records are available: Malá Fatra Mts.: NR Starhrad (Miller, 1944), Žilina (6778) (Miller, 1971), Banská Bystrica: Urpín (7280d) (Svatoň, 1985a) and Plášťovce, 31 May 1980, 1 f. (Svatoň, 1987). ESS: Slovakia – R. ESI: 325524231; 27 – AE.

*Metopobactrus rayi* (Simon, 1881) – Hajnáčka: NR Pohanský hrad, in pseudokarst caves of boulder scree slope, 29 May 1995, 1 m. (Svatoň det.). It is known only from

several findings in mountain altitudes: Malý Kriváň (6879b) (Miller, 1971 sub *Trichopterna fatrensis*); Nízke Tatry Mts.: Vlašky (6983) and Veľká Fatra Mts.: Suchý Jasienok (7079) (Miller & Žitňanská, 1976) and Nízke Tatry: Ohnište (7084) (Svatoň, 1989). Its relict occurrence in the locality only about 500 m u. s. l. is surprising and remarkable from a zoogeographical point of view. ESS: Slovakia – R. ESI: 314425321; 25 – AE.

*Micrargus georgescuae* Millidge, 1975 – Nízke Tatry Mts.: the highest part of the ‘Jánska dolina’ valley (approximately 1 700 m u. s. l.), in the litter of a mountain pine growth, 30 July 1995, 3 f. (Gajdoš et Svatoň rev.). It was described from Austria (Northern Tirol Mts.), known also from Southern Bohemia (Millidge, 1975). The first record for Slovakia. ESI: 304314221; 20: PE.

*Porrhomma myops* Simon, 1884 – Západné Tatry Mts.: Kresanica (6785) under a deeply located stone, 23 July 1990, 1 f. (Gajdoš det.). The following records are available: Plešivec (7488) (Gajdoš, in litt.), Silica (7489) (Kúrka, 1994), Turňa (7391) (Kratochvíl, 1932), ‘Demänovská’ cave (6983) (Miller & Kratochvíl, 1940b). ESS: Slovakia – V. ESI: 323424221; 23 – AE.

*Scotargus pilosus* Simon, 1913 – Banská Bystrica: Laskomer (7280), under a deeply located stone in older beech forest, 20 April 1995, 1 f. (Gajdoš rev.). A rare species found very sporadically in mountainous regions. Only four published records are available: Turčianske Teplice (7179), Kremnica (7279), Žilina (Miller & Kratochvíl, 1939) and Slovenský raj Mts.: Hrdlo Hornádu (7088a) (Žitňanská, 1987a). ESS: Slovakia – V. ESI: 325524331; 28 – AE, or up to HE.

*Taranucnus setosus* (O. P. – Cambridge, 1863) – NR Klinské rašelinisko, in wet moss (*Sphagnum*) 30 June 1994, 1 f. (Gajdoš det.). It occurs very locally and rarely in wetlands, mainly peat bogs. Known from Northern, Western and Central Europe (Heimer & Nentwig, 1991). In the former Czechoslovakia it was firstly found in Southern Bohemia (Miller, 1971), and was recently documented in three further localities in Bohemia (Kúrka, in lit.). It is the first record for Slovakia. ESS: Germany – SG, Bohemia – R. Data concerning its ESS in Slovakia are not available. ESI: 225526351; 31 – HE.

*Trichoncus hackmani* Millidge, 1955 – Belina (7785c), xerothermic sandy grassland, 5 April 1995, 1 f.; Šurice: NR Soví hrad (7785), similar biotope, 22 April 1995, 1 m. A very rare species, known only from a few records: NR Ostrov Kopáč (Gajdoš, 1987a), NR Čenkovská lesostep and Muráň (7286) (Buchar, 1995). ESS: Slovakia and Great Britain – V. ESI: 325425231: 27 – AE.

*Troxochrus nasutus* Schenkel, 1925 – Slovenské Rudohorie Mts.: Tlstý javor (9068), 17 July 1993, 1 f. (Gajdoš rev.); Banská Bystrica: Urpín, on the vegetation of a forest border during a warm evening, 26 May 1995, 1 f.; Hrochoť: Príslopy (7381), in the wet

litter of a bog, 4 June 1995, 1 f. These are the first records for the territory of Slovakia. Recorded from Central Europe (Heimer & Nentwig, 1991). It occurs very sporadically and rarely in the litter of well preserved biotopes, ostensibly prefers mountain forests. ESS: Bohemia – R, Slovakia – E (it would be V only). ESI: 303524231; 23 – AE.

#### Araneidae

*Cyclosa oculata* (Walckenaer, 1802) – Kováčovce: Hradište, xerothermic sandy slope, 29 May 1993, 1 m; Pravica (7682), xerothermic pasture, 16 May 1995, 1 sad. m.; Gemerské Dechtáre (7786), eolian sandy steppe, 10 June 1995, 1 m. Only few records are available: Súľovské skaly – Piesky (Miller & Svatoň, 1974), Turčianske Teplice: Strážna hora (7179) (Miller, 1936), Vranov (7196) and Bardejov (6793) (Chyzer & Kulczyński, 1891), Stará Bašta (Antuš, unpublished). ESS: Slovakia – R (Gajdoš & Svatoň, 1993) or V (Gajdoš, 1995), Bohemia – R. ESI: 224524231; 25 – AE.

#### Lycosidae

*Alopecosa pinetorum* (Thorell, 1856) – Nízke Tatry Mts.: close to the Jánska dolina valley (approximately 1 700 m), subalpine meadow, 30 July 1995, 1 m. (Gajdoš and Svatoň rev.). It occurs very locally and rarely in high mountains. Hitherto it was known only from Vysoké Tatry Mts. (Miller, 1971). ESS: Slovakia – V. ESI: 304415421; 24: AE.

*Arctosa perita* (Latreille, 1799) – Čenkovská lesostep, sandy grassland, 16 April 1994, 1 m. (Buchar rev.). It occurs extremely locally and rarely in sandy biotopes. Only old records from Eastern Slovakia are available. ESS: Germany – G, Slovakia – Ex (Gajdoš & Svatoň, 1993) or E (Gajdoš, 1995), Bohemia – R. ESI: 345546461; 38 – CE.

*Lycosa vultuosa* C. L. Koch, 1839 – Tachty: Teplý vrch (7885), eolian sandy steppe, 5 June 1990, 1 f.; Gemerské Dechtáre, similar biotope, 29 April 1995 and 10 June 1995, many specimens, 1 f. in our collection. It occurs very locally in sandy biotopes. Known from few records: Kamenica nad Hronom (8178), NR Zoborská lesostep, Tríbeč Mts.: Hrdovická (7575) and Plešivec (7488). ESS: Slovakia – E (Gajdoš & Svatoň, 1993) or V (Gajdoš, 1995). ESI: 245435440; 31 – HE.

#### Hahniidae

*Hahnia helveola* Simon, 1875 – Poľana Mts.: Žiarec, in the litter of older mixed forest, 23 Sept. 1995, 1 m. A rare mountain species, known from several recent records: Malá Fatra Mts.: Poludňové skaly (6780) (Svatoň & Miller, 1979), Strážovské vrchy Mts.: Kňaží stôl (7175d) (Gajdoš, 1986c), Vtáčnik Mts.: NR Veľká skala (Gajdoš, 1991a) and Vtáčnik Mts.: NR Hrádok (7377b) (Gajdoš, 1991b). ESS: Bohemia – R, Slovakia – V (Gajdoš & Svatoň, 1993) or R (Gajdoš, 1995). ESI: 204424231; 22 – AE.

*Hahnia picta* Kulczynski, 1897 – NR Boky near Budča (7480), in the litter of an old oak root cavity, 1 Febr. 1992, 1 f. (Gajdoš rev.) and 12 April 1993, 1 f.; Dobrá Niva (7580), in a hollow solitary oak, 27 Sept. 1992, 2 f. These are the first records for the Slovak territory. Recorded from Central Europe (Heimer & Nentwig, 1991). ESS: Slovakia – V. ESI: 325525341; 30 – HE.

#### Dictynidae

*Mastigusa* (= *Tetrilus*, *Tuberta*) *arietina* (Thorell, 1871) – NR Roby near Detva (7482), 3 March 1991, 1 m. in an understone colony of *Lasius niger* (Gajdoš rev.); Rykynčice (7779), 9 April 1994, 2 m. and 1 f. in a colony of *Messor muticus*; Plášťovce, in a colony of *M. muticus* on the xerothermic slope, 1 April 1994, 2 f. Other records are known from Urpín (Pavlík, 1982; Svatoň, 1985a). Its present occurrence in Urpín is highly improbable, because the xerothermic character of this locality has been totally altered by the pine afforestation. ESS: Great Britain – V, Bohemia – R, Slovakia – R (Gajdoš, 1995) or V (Gajdoš & Svatoň, 1993). ESI: 224426231; 26 – AE.

The occurrence of *Mastigusa macrophthalma* (Kulczynski, 1897) in Slovakia has not been documented conclusively, although two records are accessible: Devínska Kobyla (Žitňanská, unpublished) and Sninský kameň (7099) (Chyzer & Kulczynski, 1896). Buchar (in lit.) mentions that large-eyed specimens of *Mastigusa* found in Bohemia and Great Britain were identified as *M. arietina*. Therefore it is highly probable that the above mentioned records also concern this species.

#### Amaurobiidae

*Amaurobius erberi* (Keyserling, 1863) – NR Devínska Kobyla, under a stone on the steppe grassland, 14 April 1991, 1 f. (Buchar and B. Knoflach-Thaler rev.). This Mediterranean species occurs utmost rarely in the warmest xerothermic biotopes. Only one record is known: Slovenské Nové Mesto (Miller, 1971). ESS: Slovakia – E. ESI: 345535430; 32 – HE. Liocranidae

*Liocranum rutilus* (Thorell, 1875) – Teplý vrch (7586), under the bark of an old oak, 4 May 1991, 1 f. (Gajdoš rev); Veľký Blh (7586) under the bark of an old solitary oak, 17 May 1993, 1 f. These are the second records for Slovakia – known only from one record from NR Boky (Thomka, 1978). ESS: Germany – PE, Bohemia – R, Slovakia – V. ESI: 325525341; 30 – HE.

*Phrurolithus szilyi* Herman, 1879 – NR Hrušovská lesostep (7489), 28 May 1989, 1 f. (Gajdoš rev.); Horné Vestenice (7276), karst steppe, 23 April 1994, a pair and 6 July 1993, 2 f.; Plášťovce, xerothermic andesite slope, 23 May 1995, 2 m. and 1 f. The following records are available: Cerovo (7780) (Vachold, unpublished), Plešivská planina – Veľký vrch (7488) (Svatoň & Majkus, 1988), Kamenica nad Hronom (8178)

and Hrušov (7489) (Buchar, 1995), NR Zoborská lesostep and NR Devínska kobyla (Gajdoš, Svatoň & Krumpál, 1984), NR Holík (7679) (Gajdoš, 1987b), Veľký vrch near Partizánske (7376) (Gajdoš, 1986a), Beckovské Skalice: Dubový vršok (7273), Chľaba (8078) and Pezinok: Chrastina (7769) (Gajdoš, in litt.). ESS: Slovakia – R. ESI: 313424231; 23 – AE.

#### Clubionidae

*Ceto laticeps* (Canestrini, 1868) – NR Boky near Budča, under oak bark, 12 April 1993, 1 f.; Cerová vrchovina Mts.: Steblová skala (7785), on oak branches in a xerothermic oak forest, 6 May 1995, 1 f.; Hajnáčka: NR Pohanský hrad, on a solitary beech, 29 May 1995, 1 f.; Gemerské Dechtáre, on a solitary oak, 10 June 1995, 1 f. Only 3 records are available: Urpín – Vartovka (7280d) (Svatoň, 1985a); Hradisko near Žilina (6778) and Lietava (6878) (Bartoš, 1938). ESS: Bohemia – R, Slovakia – V. ESI: 325535341; 31 – HE.

*Cheiracanthium campestre* Lohmander, 1944 – Šurice, sandy xerothermic grassland, April 22, 1995, 1 m. (Gajdoš rev.). Known from Sweden, Poland and Germany (Heimer & Nentwig, 1991). Its distribution is almost unknown and it seems to be discontinuous; it always occurs rarely. This is the first record for Slovakia. ESI: 245524441; 31 – HE.

*Cheiracanthium montanum* (L. Koch, 1878) – Štúrovo: Hegyfarok, 30 April 1994, 2 m. (Gajdoš rev.). A very rare species of xerothermic biotopes. Only one record is available: Slovenské Nové Mesto (Miller, 1971). ESS: Slovakia – E. ESI: 345524331; 30 – HE.

#### Gnaphosidae

*Berlandina exornata* (C. L. Koch, 1838) – Čabradský Vrbovok, a rocky steppe, 31 May 1989, 1 m. (Gajdoš rev.); Medovarce, similar biotope, 27 May 1995, a pair. Additional records are available: Plášťovce and Ipeľské Úľany (7880) (Svatoň, 1984), Plešivská planina: Veľký vrch (Svatoň, Majkus, 1988); Cerovo (Vachold, unpublished), Štúrovo (Miller, 1971), Kamenica nad Hronom (Buchar, 1995). Data concerning its ESS are not accessible. ESI: 324424331; 26 – AE.

*Cryptodrassus pulchellus* Miller, 1943 – Kováčovce: Hradište, eolian sandy steppe, 27 March 1993, 1 m. A very rare species of xerothermic biotopes, known only from three localities: NR Devínska Kobyla, 9 May 1978, 1 sad. f., 8 June 1979, 1 juv. f., 9 June 1980, 1 f. and 27 June 1980, 1 f.; NR Zoborská lesostep, 29 April 1978, 2 juv. f. (Gajdoš, Svatoň & Krumpál, 1984); Slovenský raj Mts.: Dedinky, July 1974-1977, 2 f. (Žitňanská, 1987a), the last record from mountain altitudes is surprising and very remarkable. ESS: Slovakia – V. ESI: 324435441; 30 – HE.

*Echemus angustifrons* (Westring, 1862) – Plášťovce, xerothermic andesite slope, 23 May 1995, 1 m. (Gajdoš rev.). It prefers warm biotopes, where it occurs very sporadically. Known from Southern Europe (Serbia, Bulgaria) and also from Central Europe (Germany, Austria, Moravia), where it ranks among the rarest spiders (Miller, 1947). Only one record is accessible: Kováčov (8 178d) (Gajdoš, Svatoň, 1993). ESS: Germany – Ex, Bohemia – R, Slovakia – E. ESI: 325525331; 29 – HE.

*Haplodrassus dalmatensis* (L. Koch, 1866) – Belina, xerothermic sandy grassland, 5 April 1995, 1 f. (Gajdoš rev.). It occurs sporadically and rarely in warm biotopes. Additional records include: Košice (7293) (Chyzer & Kulczynski, 1896), Turčianske Teplice (Miller, 1936), Urpín (Svatoň, 1985a), Muránska planina: Hradová (7385) (Svatoň, 1985b), Topoľové Hony (7869) and Hamuliakovo (7969) (Krumpál, 1994), NR Kopáč (7968) (Gajdoš, 1987a), NR Zoborská lesostep (Gajdoš & Krumpál, 1987); Malanta (7674), Jurová (8071) and Bohelov (8072) (Gajdoš, in lit.). ESS: Germany – G, Bohemia – R, Slovakia – V. ESI: 324424241; 26 – HE.

*Haplodrassus kulczynskii* Lohmander, 1942 – Horné Vestenice, xerothermic karst slope, 1 May 1993, 1 m.; Nitrianske Rudno (7176), 24 April 1993, 1 m.; Rykynčice, 9 April 1994, 1 f. (Gajdoš det.); Selešťany (7981), xerothermic sandy grassland, 8 April 1995, 2 m. The following records are available: NR Devínska Kobyla (Žitňanská, 1980), Slovenské Nové Mesto and Vinné (7197) (Chyzer & Kulczynski, 1899), Muráň (7286) (Buchar, 1995), Veľký vrch (Gajdoš, 1986a), NR Holík (Gajdoš, 1986b). ESS: Bohemia – R, Slovakia – V. ESI: 324424241; 26 – AE.

*Micaria dives* (Lucas, 1846) – Gemerské Dechtáre, eolian sandy grassland, 6 May 1995, 2 m. and 10 June 1995, 1 f. It occurs locally and rarely in well preserved warm biotopes. Only a few recent records are available: NR Boky (Thomka, 1978), NR Chotínske piesky (8175c) (Svatoň, 1981), Urpín (Svatoň, 1985a), NR Zoborská lesostep (Gajdoš & Krumpál, 1987) and Slovenský kras: Veľký vrch (Svatoň & Majkus, 1988). ESS: Germany – Ex, Slovakia and Bohemia – R. ESI: 324424331; 26 – AE.

*Micaria subopaca* Westring, 1861 – Banská Bystrica, under the bark of a lime tree, 12 Febr. 1993, 1 f. (Gajdoš rev.); Vlkanová (7380) an old oak forest, 20 March 1993, 1 m. (Gajdoš rev.); Slovenský kras Mts.: NR Hrušovská lesostep (7489), karst slope, 27 May 1989, 1 f. Additional records are available: Malanta and Veľký vrch (Gajdoš, in lit.), NR Kopáč (Gajdoš, 1987a); Bardejov and Trebišov (7 396) (Chyzer & Kulczynski, 1891), Hrušov (Buchar, 1995). ESS: Slovakia – V. ESI: 213423231; 21 – PE.

*Phaeocedus braccatus* (L. Koch, 1866) – Plášťovce, xerothermic rocky steppe, 16 June 1996, 1 m. It occurs locally and rarely in warm biotopes. The following recent records are available: Urpín (Svatoň, 1985a), NR Devínska Kobyla (Gajdoš, 1981),

Vinné, 13 May 1970, 1 f. (Žitňanská, 1977), Súľovské skaly, July 1971, 1 m., Miller lgt. (Kůrka, 1994), NR Boky (Thomka, 1978), and Plešivská planina (Svatoň & Majkus, 1988). ESS: Germany – G, the former ČSFR – E, Slovakia – R. ESI: 324434330; 26 – AE.

*Poecilochroa variana* (C. L. Koch, 1839) – Šurice, basalt rocky steppe, 22 April 1995, 1 sad. m.; Gemerské Dechtáre, aeolian sandy steppe, 29 April 1995, 1 sad. m. It occurs very locally and rarely in the warmest biotopes. Known only from several findings: NR Devínska kobyla (Gajdoš, Svatoň & Krumpál, 1984), Slovenský kras – Brzohôrka (7388d) and Gombasek (7488b) (Svatoň & Majkus, 1988). ESS: Germany – Ex, Slovakia: V. ESI: 335525330; 29: HE.

*Scotophaeus blackwalli* (Thorell, 1871) – NR Pohanský hrad, under the bark of an old dying oak, 26 Sept. 1995, 1 f; Plášťovce, similar circumstances, 16 June 1996, 1 f. A very rare species, recently known from two records: Vtáčnik Mts.: NR Veľká skala, 3 June 1988, 2 f. (Gajdoš, 1991a) and Krivín (7677), 3 April 1990, 1 f. (Gajdoš, 1992). ESS: Slovakia – V (Gajdoš & Svatoň, 1993) or R (Gajdoš, 1995). ESI: 325524231; 26 – AE.

#### Philodromidae

*Thanatus sabulosus* Menge, 1875 – Veľká Fatra Mts.: Rybô (7180), dry pasture on limestone, 24 June 1994, a pair (Gajdoš det.). Only three records from Slovakia are known: NR Veľká skala, pine forest (Gajdoš, 1991), Veľká Trná: Rozhľadňa (7596) (Gajdoš, unpublished) and NR Kopáč (7968), xerothermic slope with pines (Gajdoš, 1987a). Its occurrence in the mountain region of Veľká Fatra is remarkable. ESS: Slovakia – V, Bohemia – R. ESI: 324424341; 27 – HE.

#### Thomisidae

*Diaeä pictilis* (Banks, 1896) – Dobrá Niva, 22 May 1992, 1 m. shaken down from the branches of an ancient solitary oak (Buchar rev.). This is the first record for Slovakia – known only from Southern Moravia (Lednice) and Southern Bohemia (Třeboň), it always occurs very rarely (Buchar, 1992a). It is a relict of ancient pasture woodlands – its range is large, but apparently discontinuous. ESS: the former ČSFR – E, Bohemia – R, Slovakia – I (it would be V at least). ESI: 545546451; 39: CE.

*Xysticus kempeleni* Thorell, 1872 – Štúrovo: Hegyfarok, 2 May 1992, 1 m. and 30 April 1994, 1 m. (Gajdoš rev.). It occurs very rarely especially in warm biotopes. Known only from sporadic records: Slovenský kras: Veľký vrch (Svatoň & Majkus, 1988) and a dubious record from Malá Fatra Mts.: Turská dolina (Bartoš, 1938). ESS: Germany – PG, Slovakia – R. ESI: 325424331; 25 – AE.

## Salticidae

*Marpissa (= Hyctia) nivoyi* (Lucas, 1846) – Štúrovo: Hegyfarok, on oak branches in a xerothermic forest, 30 April 1994, 1 f. (Gajdoš rev.); Hajnáčka: NR Pohanský hrad, similar biotope, 11 June 1995, 1 juv. f. A rare species of warm biotopes, recently known from several records: Vihorlat Mts "710" (Žitňanská, 1972), Urpín (Svatoň, 1985a), Turecký vrch near Nové Mesto nad Váhom (Svatoň lgt., unpublished), NR Šúr (Jedličková, 1988), NR Devínska Kobyla (Žitňanská, 1987b), Malý Dunaj (7869) and NR Dead branch of the Danube river near Čižov (8272) (Gajdoš et al., 1992). ESS: Slovakia – R, Germany – SG. ESI: 324414231; 23 – AE.

*Sitticus distinguendus* (Simon, 1869) – Príbelce (7781), xerothermic sandy grassland, 30 May 1993, 1 f. (Gajdoš rev.). It occurs sporadically and rarely in sandy biotopes. Only a few old records are available: Slovenské Nové Mesto, Streda nad Bodrogom (7696), Somotor (7596), Sninský kameň (Chyzer & Kulczynski, 1891) and Dolný Bar (8067) (Chyzer & Kulczynski, 1899). Only one recent record has been published: Nová Sedlica: the valley of the Zakasárenský potok brook (6900), 15 June 1980, 2 m. and 1 f. (Gajdoš, Svatoň & Majkus, 1988). ESS: Slovakia – I (although it seems that it ought to be higher, at least R). ESI: 325425341; 29 – HE.

*Sitticus dzieduszyckii* (L. Koch, 1870) – Teplý vrch near Tachy, xerothermic sandy grassland, 5 June 1990, 1 f. (Gajdoš rev.); Belina, similar biotope, 5 April 1995, 1 m. (Gajdoš rev.). A rare species living also in sandy biotopes. Only a few old records are available: Štrbské Pleso (6886) (Herman, 1879), Nová Baňa (7577) (Dudich, Kolosváry & Szalay, 1940), Slovenské Nové Mesto, Streda nad Bodrogom and Somotor (Chyzer & Kulczynski, 1891), Veľké Trakany (7698) and Dolný Bar (Chyzer & Kulczynski, 1899). ESS: Slovakia – V. ESI: 325425341; 29 – HE.

## CONCLUSIONS

In this paper data concerning the distribution, ecology and conservation problems of several rare spiders in Slovakia are presented. Ten of them are the first documented records for the Slovak territory: *Centromerus laevitarsis*, *Hylyphantes graminicola*, *Lepthyphantes midas*, *Micrargus georgescuae*, *Kratochviliella bicapitata*, *Taranucnus setosus*, *Troxochrus nasutus*, *Hahnia picta*, *Cheiracanthium campestre* and *Diaeapictilis*.

Findings of *Centromerus capucinus*, *Cineta gradata*, *Arctosa perita*, *Liocranum rutilans*, *Amaurobius erberi*, *Cheiracanthium montanum* and *Echemus angustifrons* are the second records for the Slovak territory.

Almost one half of the spiders in the Slovak fauna have a wide ecosozological applicability, mainly as bioindicators of well preserved and valuable biotopes; but they also indicate primeval fragments and microrefugia in the exploited and urbanized landscape. We can see that the majority of recent findings listed in this paper were made in protected territories or in ones that are appropriate and acceptable for territorial protection. But many spiders are seriously threatened by human exploitation of the landscape which is mostly one-sided. A review of the most threatened species mentioned in this paper with their ESI is given below:

- 30: *Atypus muralis*, *Hahnia picta*, *Liocranum rutilans*, *Cheiracanthium montanum* and *Cryptodrassus pulchellus*;
- 31: *Centromerus laevitarsis*, *Taranucnus setosus*, *Lycosa vultuosa*, *Ceto laticeps* and *Cheiracanthium campestre*;
- 32: *Kratochviliella bicapitata*, *Amaurobius erberi*;
- 38: *Arctosa perita*;
- 39: *Diaeapictilis*.

Biotopes of these species (and all valuable biotopes with high biodiversity in general) demand the strictest territorial protection and special management which would guarantee that deterioration of the biota will be limited to the highest degree.

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