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Research of epigeic spider communities of high Mountain Valley in western Tatra (Jalovec Valley)

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RIASSUNTO

Nel 1992 (dal 25-5 al 21-10), in 15 stazioni della Valle di Jalovec, sono stati raccolti, mediante trappole a caduta, 3739 ragni appartenenti a 16 famiglie. La famiglia dei *Linyphiiae* (D dal 12,20% al 90,58%) è risultata eudominante. La misura dell'abbondanza delle diverse comunità varia da 2.21 (st. 4) a 35.45 ex / giorno / 10 m (st. 11). Le stazioni su arenarie e scisti presentano una più elevata diversità. La diversità è minore nelle stazioni sui graniti. Le specie *Euntelecara errata* (molto rara, conosciuta solo per la Gran Bretagna e adesso per la Slovacchia), *Lepthyphanthes varians*, *Panamomops palmgreni*, *Saloca kulczynskii*, *Scotinotylus antennatus*, *Walckenaeria incisa* e *Zora distincta* sono i ritrovamenti più interessanti per la fauna della Slovacchia.

Parole chiave: Araneae, Faunistica, Biotopi montani, Tatra occidentali, Slovakia.

ABSTRACT

In 1992 (from 25.5 till 21.10) at 15 study sites (st.) at the Jalovec valley, 3.739 spiders belonging to 87 species were captured using the pitfall trap method. The ascertained species belong to 16 families. The family *Linyphiidae* (D from 12,20% to 90, 58%) was eudominant. The measure of abundance of the separate communities was from 2.21 (st. 4) to 35.45 ex/day/10m (st. 11). More diverse were the study sites at limestone and shists (transect 4-Sivy vrch.). The diversity at granite sites was less. The following species: *Entelecara errata* (very rare species, known only from Great Britain, and newly found in Slovakia), *Lepthyphanthes varians*, *Panamomops palmgreni*, *Saloca kulczynskii*, *Scotinotylus antennatus*, *Walckenaeria incisa*, and *Zora distincta* are the most important findings for the Slovakian fauna.

Key words: Araneae, Faunistics ekology, Montane biotopes, Western Tatras, Slovakia.

Introduction

The Western Tatras are a part of Tatra National Park. The Tatras are famous for their various montane biotopes with a high diversity of plant and animal species, including spiders. Concerning the study of arachnofauna, the High Tatras are the most studied territory in Slovakia. The first findings of the arachnofauna in the High Tatras dates back to the second half of the 19th century and are connected with names NOWACKI, KOCH, KULCZYNSKI, CHYZER, HERMAN. The majority of the data by these authors are observations of the spiders at the Polish side of the High Tatras. Since then the observations of the Slovak part have been done by CHYZER and KULCZYNSKI (1891, 1894, 1897, 1899). The next stage in arachno-research took place in the 1930's by CZECH and Hungarian researchers (MILLER, SILHAVY, KRATOCHVIL, KOLOSVARY, BALOGH). The results of the research up to the seventies was summarized by MILLER (1974). In the last decade much knowledge of the spiders in the Tatras was done by SVATON (1983). He gathered his results by doing research on spiders from the central part of the Tatras from 1977 to 1981, and by collecting all literary data known till then. As previously stated, the majority of the data came from the central part of the Tatras and the Western part the data is only sporadically collected; the research up to the present time has been only the faunistic-ecological character.

The aim of this paper is to evaluate the results from research done on spiders in 1992 in Jalovec valley, which is part of a longterm project 730 Researchers of high mountains valley systems. From the arachnological point of vew this project aimed the spiders communities, the seasonal changes of the communities, the changes which correspond to the evolution of morphodynamic processes, and the plant seril stages.

Materials and methods

During 1992 the communities of epigeic spiders in the Jalovec valley system in the Western Tatras have been studied at 15 sites and 4 morphodynamic systems-transect. This real and spatial units at the base of algorithms were stated and have taken into consideration the static and dynamic habits of the ecosystem's landforms. These are manifested in long term, as well as in short term, pulses; respectively the disastrous results change. At the end of the deglatiated part of the valley (trog)

there are transects of the periglatial boulder stream and through the debris flow. In the lower parts of the trog there are transects of the avalanche troughand transects of the debris shifts flow. Spiders were caught using the method of formalin pitfall traps. On each study site 4 pitfall traps, 10 cm in diameter and 5-10 m distance, were placed. Traps at 10 study sites were exposed from May 25, 1992 till October 21, 1992. Traps at five sites were added from July 6-7, 1992 because unfavorable climatic circumstances (snow and heavy rains), prevented their placement in May. Spiders from pitfall traps were collected at monthly intervals.

The similarity of the epigeic spider communities was evaluated on the basis of WISCHARTS index (PODANI, 1980). The 10 study sites from May 25 and July 6, 1992 were evaluated separately and then all clumped together. The spiders were considered according the PLATNICK system (1989).

Characteristics of the territory

The Jalovec valley is one of the most preserved valleys in the Western Tatras (geographic position is 49°12' latitude and 49°40' longitude (Fig. 1). The lowest point at the bottom of the valley is where the streams of the Poliansky creek and the Jalovcianka brook come together at an altitude of 1005 m. The surrounding peaks and ridges reach the altitude of 1600-1975 m above sea level. The summits exceed the ridges in height by approximately 400-560 m; in the low part of the valley, the trog part, it is only 200-300 m, and at Pallenica gap it is only 50 m. The valley's relief can be characterized as cliff and ridges, cut fluvially at the end of the glacial period. From the geological point of view, the main part of the dranage basin of the Poliansky creek is built up from granodiorite and only the Sivy vrch is built up from schists consisting in the upper part of mesozoic merl limestone and dolomite. The climate is midly cool to midly chilly. The average yearly rainfall reaches 950-2000 mm (at the high altitudes in form of snow present for 6 months out of the year). The long term yearly average temperature in 3° C to 0.0° C (KONCEK *et al.*, 1974).

Transect 1 - The block stream - 1710 - 1903 m a.s.l.

Exposition: south, Position: upper part of Jalovec valley-trog

st.1 - alpine meadow on acid solifluction garland soils with the dominant occurence of *Juncus trifidus* living in nivation niches,
st.2 - alpine meadow on acid solifluction garland soils with the dominant occurence of *Juncus trifidus*,
st.3 - alpine meadow with dominant occurence of *Calamagrostis* sp.,
st.4 - block stream without vegetation cover.

Transect 2 - The debris flow trough - 1700 - 1920 m a.s.l.

Exposition: north, Position: upper part of Jalovec valley

st.5 - mouth of debris flow trough near firn flat with pioneer communities,
st.6 - debris cone - alpine grassland.

Transect 3 - The debris mantle removing - 1390 - 1700 m a.s.l.

Exposition: north-west, Position: lower part of deglaciated valley

st.7 - plantation of mountain pine,
st.8 - shift table debris cover without vegetation,
st.9 - wet acid spruce forest.

Transect 4 - (Sivy vrch-top) - The avalanche trough - 1310 - 1805 m a.s.l.

Exposition: south-east, Position: lower part of deglaciated valley

st.10 - limestone debris flow in close contact with plantations of lime-loving herbaceous plant communities, where *Carex sempervirens* and *Sesleria coerulea* are dominant,
st.11 - narrow debris field in belt of mountain pine in close contact with mountain meadows, with groups of dwarfed pines,

st.12 - small meadow with the dominant occurence of *Calamagrostis* sp.,
st.13 - hydrophilous communities with groups of bushes and small trees,
st.14 - abandoned pasture on acidic soils,
st.15 - bank of mountain brook with alluvial tall herbaceous communities.

Results and discussion

During 1992. at the aforementioned sites, 3.739 spiders belonging to 87 species (Tab. 1 and 2) were captured in formalin pitfall traps. The ascertained species belonged to 16 families (Tab. 3); eudominantly the family *Linyphidae* (D from 12.20% to 90.58%) was present. The abundance and occurence of dominant and rare species in separate communities is shown in Table 4. The measure of abundance of the separate communities was from 2.21 (st.4) to 35.45 specimen per day and there was an effective distance of 10 m between the pitfall traps (st.11). The highest abundance was present in communities from study sites 12,14 and 9, that had a well differentiated plant cover. The study sites on limestone and shists (transect 4 - Sivy vrch) had more species of spiders. The granite sites were less diverse. At most of the study sites it was observed that the eudominantly occuring spider *Centromerus pabulator* was captured in great numbers in the traps in autumn. This great occurence in the High Tatras was also found by MILLER (1974). For the Slovakian fauna the most important findings are the following species: *Centromerita cocinna*, *Diplocephallus helleri*, *Entelacara errata* (very rare species, known only in Great Britain, and newly found in Slovakia) *Gongylidiellum vivum*, *Lepthyphantes expuntatus*, *Lepthyphantes pulcher*, *Lepthyphantes varians* (endemic of High Tatras), *Panamomops palmgreni* (alpine species), *Saloca kulczynskii*, *Scotinotylus antennatus* (rare alpine species), *Walckenaeria incisa*, *Hahnia difficilis*, *Zora distincta* (endemic of the Low and High Tatras).

Since the spider communities in the High Tatras were not studied we are able to compare only the faunistic results. The 272 species found in Central part of the High Tatras were documented and so were another 87 species in the Western Tatras. This enriched the knowledge on the Tatra's fauna on 11 new species. Because the alpine species *Panamomops palmgreni* (THALER, 1973) *Scotinotylus antennatus* were found, this suggests that the Tatra Montains and Alps developed to-

gether. The finding of the species *Panamomops palmgreni* from the Slovak territory (Belanske Tatry) was published by KASAL (1983). Based on the field results from 1992 we can state that the composition of the communities reflects the differences between biotic and abiotic factors on the environment within the individual study sites.

Comparison of the epigeic spider communities

By using the similarity of abundance (cca 10%) on the basis of Wischart's test of the UPGMA method, the 15 spider communities collected July 6, 1992 could be divided into 3 clusters (Fig. 2a). The community from site 5 remained isolated (outside of that division) because of the specific character of the site on the edge of the firn field in the trough. The underlayer (basis) is formed by tiny moving fragments settled by some pioneer species like *Erigone dentipalpis* (34, 29%) and *Meioneta rurestris.*

In the first cluster (I) were included sites 1 and 2 (transect 1). Those sites are at the highest altitudes and their plant covering is formed by *Juncetum trifidi.* In comparison with other sites these are distinguished by the eudominant occurence of species *Pardosa saltuaria* and *Haplodrassus signifer.* Comparing sites 1 and 2, site 1 has a higher prortion of pioneer species like *Erigone atra, Erigone dentipalpis* and *Meioneta rurestris.*

The second cluster involves most of communities with a high degree of occurence of species like *Centromerus pabulator.* The second cluster can be subdivided into three subclusters. The community from site 10, inside the second cluster (II), remained isolated; this is caused by the specific character of the site that has the eudominant occurence of the species *Bolyphantes luteolus* (26.83%).

The first subcluster (IIa) contains communities from site 3, 6, 7 and 9, where the occurence of the species *Centromerus pabulator* (from 40.02% to 63.86%) is very high.

The second subcluster (IIb) contains the sites of the central part of Sivy vrch-top (transect 4) formed (composed) by schists, in upper parts by limestone and dolomite, and have a southern exposition. The geological formation and the southern exposition cause the higher diversity of plant and animal communities; this can be observed in spider communities, as well.

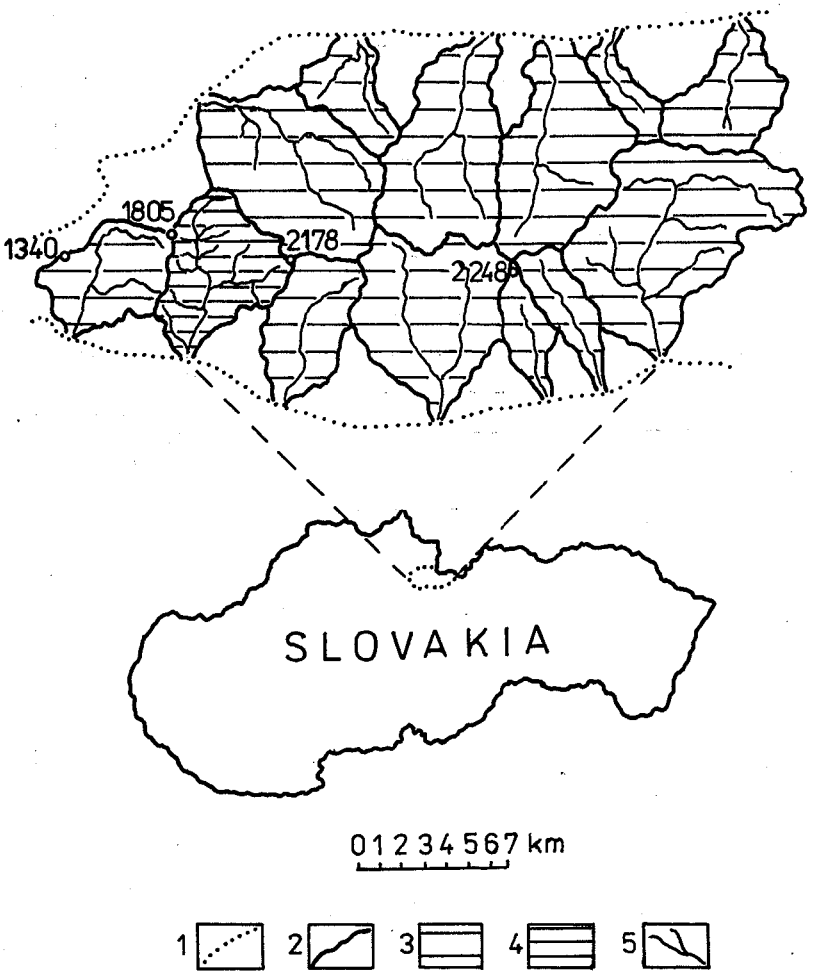

Fig. 1 - Valley system of the Tatras Western (author J. Hreško). 1 - boundaries of the W. Tatras, 2,3 - boundaries and territory of valley system, 4 - study territory, 5 - water flows.

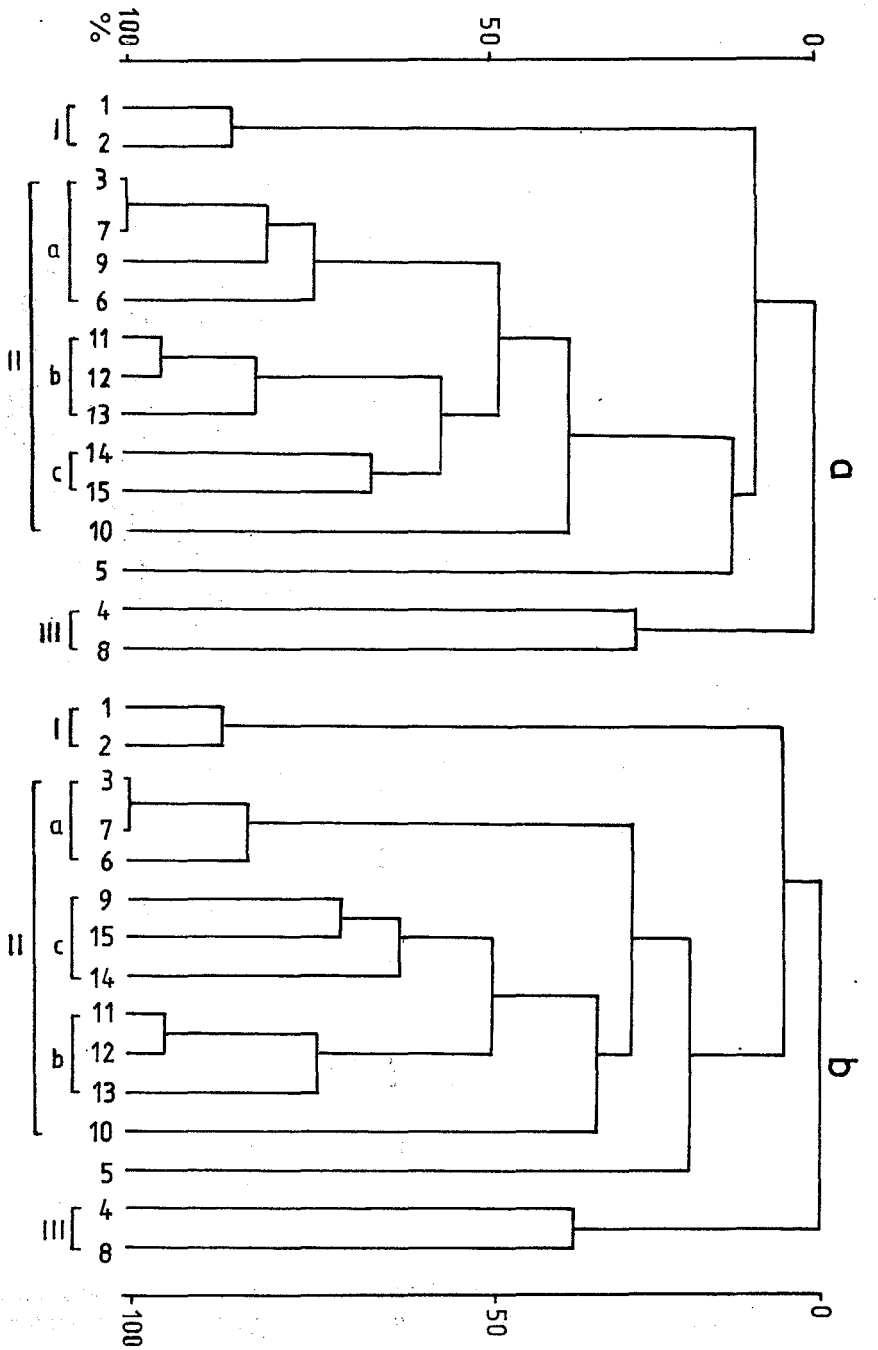

Fig. 2 a, b - Hierarchical classification of epigeic spider communities in study sites, from 6-7.7.1992 to 20-21.10.1992, according to the similarity of abundance (Wisharts index) a - UPGMA, b - Complete linkage, the symbols in methods.

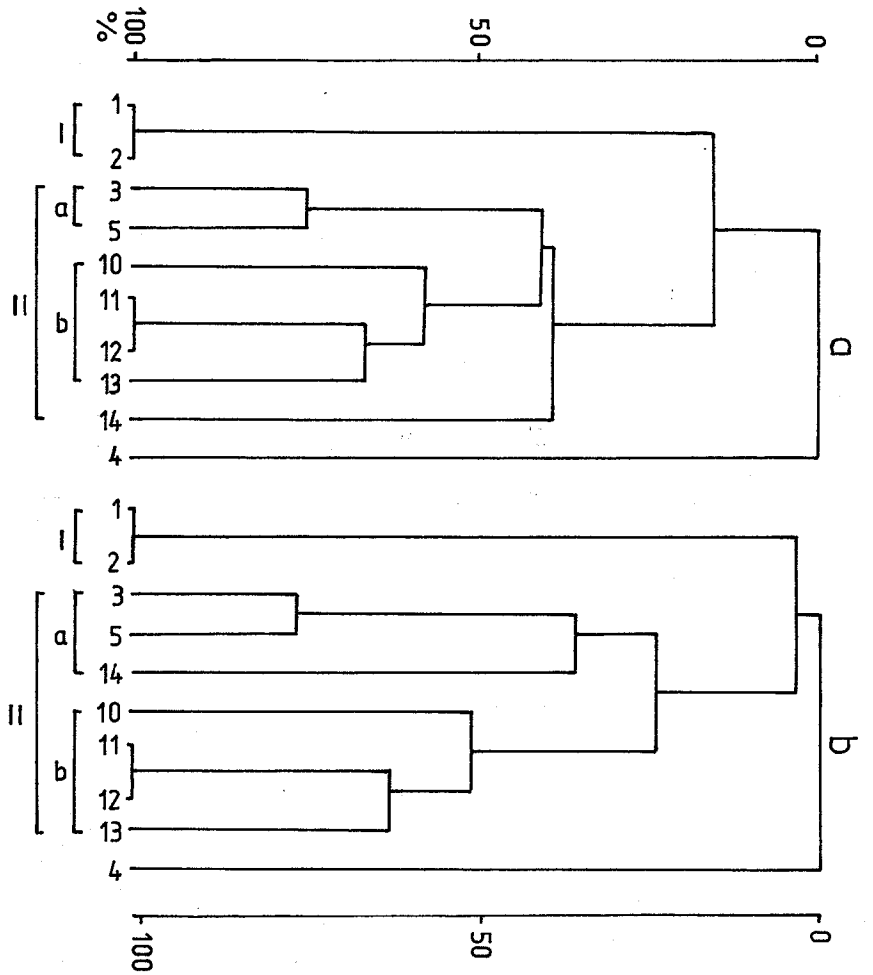

Fig. 3 a, b - Hierarchical classification of epigeic spider communities in study sites, from 25.5.1992 to 20-21.10.1992, according to the similarity of abundance (Wisharts index) a - UPGMA, b - Complete linkage, the symbols in methods.

Tab. 1 - Dominant activity of epigeic spiders caught in pitfall traps in transect 1 and 2 pitfall traps on sites 1 - 4, 6 were exposed from 2.5 to 21.10.1992 and on site 5 from 7.7.1992 to 21.10.1992. st. - study sites

Species	Transect 1 - Brestová			Transect 2		
	st. 1	st. 2	st. 3	st. 4	st. 5	st. 6
Ero furcata (Villers, 1789)			0.26			
Robertus truncorum (L. Koch, 1872)						1.66
Bolyphantes luteolus (Blackwall, 1833)			3.31	2.44	8.57	22.99
Centromerita bicolor (Blackwall, 1833)		0.89				
Centromerita concinna (Thorell, 1875)	0.69					
Centromerus arcanus (O.P. - Cambridge, 1873)			2.00			
Centromerus pabulator (O.P. - Cambridge, 1875)	4.14	16.91	56.10		14.29	32.19
Centromerus sylvaticus (Blackwall, 1841)		0.45				
Ceratinela brevis (Wider, 1834)		1.34				
Cnephalocotes obscurus (Blackwall, 1834)		0.89	0.35	2.44		
Diplocephalus cristatus (Blackwall, 1834)					5.71	
Diplocephalus latifrons (O.P. - Cambridge, 1863)						2.04
Erigone atra Blackwall, 1833	16.33	1.63				
Erigone dentipalpis (Wider, 1834)	5.29	0.59			34.29	
Lepthyphantes alacris (Blackwall, 1853)			0.35			
Lepthyphantes monticola (Kulczynski, 1881)			0.96		5.71	3.07
Lepthyphantes pulcher (Kulczynski, 1881)						1.92
Lepthyphantes tenebricola (Wider, 1834)		0.45			5.71	0.51
Lepthyphantes varians (Kulczynski, 181)					5.71	
Leptorhoptrum robustum (Westring, 1851)					2.86	0.77
Linyphiidae not det.	0.69					1.53
Meioneta rurestris (C.L. Koch, 1836)	16.55	11.87	12.45	2.44	8.57	1.79
Micrargus herbigradus (Blackwall, 1854)	0.69					
Oedothorax gibbifer (Kulczynski, 1882)					2.86	
Oedothorax retusus (Westring, 1851)		0.59		4.88	2.86	
Panamomops palmgreni Thaler, 1973		0.45	0.70			

Tab. 1 - contd.

	Transect 1 - Brestová				Transect 2	
	st. 1	st. 2	st. 3	st. 4	st. 5	st. 6
Pelecopsis radicicola (L. Koch, 1875)			0.96			
Scotinotylus antennatus (O.P. - Cambridge, 1875)		4.15				
Walckenaeria cuspidata Blackwall, 1833						1.92
Walckenaeria sp.						0.51
Alopecosa pulverulenta (Clerck, 1757)		0.45				0.77
Pardosa monticola (Clerck, 1757)	0.69	1.19				
Pardosa nigra C.L. Koch, 1834	1.61	0.89		80.49		0.77
Pardosa palustris (Linnaeus, 1758)	1.38	0.89	0.61			
Pardosa pullata (Clerck, 1757)	1.61	1.78	0.52			1.53
Pardosa saltuaria (L.C. Koch, 1870)	26.44	35.16	4.53	2.44		2.04
Pirata sp.			0.26			
Trochosa tericola Thorell, 1856		0.45				
Cybaeus aungustiarum L. Koch, 1868			0.87			
Cryphoeca carpahica Herman, 1879	0.69				2.86	20.69
Coelotes atropos (Walckenaer, 1825)	6.21	0.45	3.48			3.32
Coelotes terrestris (Wider & Rauss, 1834)		1.19	1.31	2.44		
Coelotes sp.	1.38	0.45	0.26			
Gnaphosa sp.		0.59				
Haplodrassus signifer (C.L. Koch, 1839)	14.71	14.99	8.10			
Zelotes subterraneus (C.L. Koch, 1833)			2.35			
Ozyptila trux (Blackwall, 1846)	0.92					
Xysticus alpicola Kulczynski, 1882		0.45				
Xysticus audax (Schrank, 1803)				2.44		
Xysticus kempeleni Thorell, 1872		0.45				
Xysticus luctuosus (Blackwall, 1836)		0.45				
Euophrys monticola Kulczynski, 1884			0.26			
Total	100.02	100.02	99.99	100.01	100.0	100.02
Abundance (number of specimens in 4 pf. traps)	145	224.67	382.66	41	35	261

Tab. 2 - Dominant activity of epigeic spiders caught in pitfall traps in transect 3 and 4 pitfall traps on sites 10-14 were exposed from 25.5 to 21.10.1992 and on sites 7 - 9, 15 from 7.7.1992 to 21.10.92. st. - study sites

Species	Transect 3			Transect 4 - Sivy vrch					
	st. 7	st. 8	st. 9	st. 10	st. 11	st. 12	st. 13	st. 14	st. 15
Robertus truncorum (L. Koch, 1872)	0.58	0.61	3.24			0.76			
Bathyphantes nigrinus (Westring, 1851)							0.29		
Bolyphantes alticeps (Sundevall, 1832)					6.37	1.37	0.29	2.45	
Bolyphantes luteolus (Blackwall, 1833)	3.18	2.42		21.02	9.55	5.46	0.29	0.57	
Centromerita bicolor (Blackwall, 1833)					0.64	0.15		0.19	
Centromerus arcanus (O.P. - Cambridge, 1837)				1.91		0.15	0.87		
Centromerus incilium (L. Koch, 1881)								0.19	
Centromerus pabulator (O.P. - Cambidge, 1875)	47.40	13.33	40.02	10.83	19.11	24.13	11.34	20.19	23.70
Centromerus sylvaticus (Blackwall, 1841)			1.48	0.64	5.09	6.22	2.03	6.79	18.50
Centromerus sp.				1.91					
Ceratinela brevis (Wider, 1834)				1.27	0.64		0.87		
Cnephalocotes obscurus (Blackwall, 1834)				2.55			0.29	14.34	
Dicymbium tibiale (Blacwall, 1836)								0.19	
Diplocephalus cristatus (Blackwall, 1833)		13.94		1.27	1.27	0.15			
Diplocephalus latifrons (Blackwall, 1833)	0.29		18.58	1.27	3.19	1.06	6.10	0.57	6.36
Diplocephalus helleri (L. Koch, 1869)					0.64	0.15			0.58
Entelacara errata (O.P. - Cambridge, 1913)		1.82							
Erigone atra Blackwall, 1833		0.61		1.27				0.38	1.16
Erigone dentipalpis (Wider, 1834)								0.38	
Gonatium rubellum (Blackwall, 1841)	1.45	1.82		5.73	17.20	18.97	7.27	2.45	5.78
Gongylidiellum vivum (O.P. - Cambridge, 1875)								0.19	
Lepthyphantes alacris (Blackwall, 1835)	0.29	2.42	4.16		0.64	0.46	0.87	0.19	0.58
Lepthyphantes arciger (Kulczynski, 1882)	0.58								
Lepthyphantes expunctatus (O.P. - Cambridge, 1875)			0.92						

Tab. 2 - contd.

Species	Transect 3			Transect 4 - Sivy vrch					
	st. 7	st. 8	st. 9	st. 10	st. 11	st. 12	st. 13	st. 14	st. 15
Lepthyphantes monticola (Kulczynski, 1881)				0.64		0.15	1.74		
Lepthyphantes mughi (Fickert, 1875)	1.73		2.51	0.64	0.64	0.15	3.49	0.38	1.16
Lepthyphantes pallidus (O.P. - Cambridge, 1871)				0.64		0.46			
Lepthyphantes pulcher (Kulczynski, 1881)	3.18	8.48	0.55	0.64					
Lepthyphantes tenebricola (Wider, 1834)	5.78	1.21	13.31	7.64	10.83	26.86	12.21	1.32	9.83
Leptorhoptrum robustum (Westring, 1851)						0.30	0.29	1.70	4.62
Linyphiidae not det.				0.64					
Maso sundevalli (Westring, 1851)			0.37			0.30			
Meioneta rurestris (C.L. Koch, 1836)		3.03		2.55		0.15	3.20	5.47	
Micrargus herbigradus (Blackwall, 1854)		0.61	0.74		0.64	0.30	0.29	0.57	0.58
Microneta viaria (Blackwall, 1841)	1.73						0.29		
Minyriolus pusillus (Wider, 1834)				0.64	0.64				
Microlinyphia pusilla (Sundevall, 1829)								0.19	
Oedothorax agrestis (Blackwall, 1853)					0.64				
Oedothorax gibbifer (Kulczynski, 1882)									2.31
Oedothorax retusus (Westring, 1851)		1.21			1.27		0.29		
Oedothorax sp.								0.19	
Panamomops palmgreni Thaler, 1973		0.61							
Pelecopsis radicicola (L. Koch, 1875)	2.31					0.76	2.03		
Peociloneta globosa (Wider, 1834)						0.30			
Saloca kulczynskii Miller & Kratochvil, 1939						1.82			
Walckenaeria antica (Wider, 1834)				0.64					
Walckenaeria cuspidata Blackwall, 1833	0.29	1.21							
Walckenaeria incisa (O.P. - Cambridge, 1875)	0.29								

Tab. 2 - contd.

Species	Transect 3			Transect 4 - Sivy vrch					
	st. 7	st. 8	st. 9	st. 10	st. 11	st. 12	st. 13	st. 14	st. 15
Walckenaeria mitrata (Menge, 1868)								1.32	
Pachygnatha sp.							0.29		
Aculepeira ceropegia (Walckenaer, 1802)					0.64			0.19	
Alopecosa aculeata (Clerck, 1757)				0.64					
Alopecosa pulverulenta (Clerck, 1757)	0.87			3.19	3.19		8.43	24.91	2.31
Alopecosa sp.				1.27		0.15			1.16
Pardosa amentata (Clerck, 1757)					7.01				1.16
Pardosa nigra C.L. Koch, 1834	10.98	21.82							
Pardosa pullata (Clerck, 1757)					0.64			0.76	0.58
Pardosa saltuaria (L. Koch, 1879)	5.20			1.91					
Pardosa sp.	0.29				2.55		0.29		
Pirata hygrophilus Thorell, 1872							0.29		4.05
Pirata sp.	0.29				1.91				0.58
Trochosa tetricola Thorell, 1872				0.64			0.58	2.26	
Xerolycosa nemoralis (Westring, 1861)				0.64					
Tegenaria silvestris L. Koch, 1872									0.58
Cybaeus angustiarum L. Koch, 1868	1.16	3.64	8.78	5.73	0.64	5.92	12.79	1.51	5.20
Cryphoeca carpathica Herman, 1879	1.45	0.61	3.05		1.91		0.29		
Hahnia difficilis Harm, 1966	0.29	0.61					0.29	0.19	
Hahnia montana (Blackwall, 1841)				0.64					
Hahnia nava (Blackwall, 1841)				0.64					
Callobius claustrarius (Hahn, 1831)				1.91			7.85	0.57	
Coelotes atropos (Walckenaer, 1825)	5.49	7.88	0.28	2.55		0.30	0.58	0.57	8.09

Tab. 2 - contd.

Species	Transect 3			Transect 4 - Sivy vrch					
	st. 7	st. 8	st. 9	st. 10	st. 11	st. 12	st. 13	st. 14	st. 15
Coelotes inermis (L. Koch, 1855)	0.29	0.61					4.65	0.38	
Coelotes terrestris (Wider & Rauss, 1834)	2.31	4.24	1.66	0.64		0.61	1.45	5.09	
Coleotes sp.	0.29	1.21	0.37			0.76	2.03	0.38	1.16
Clubiona alpicola Kulczynski, 1882		1.21		0.64		0.30			
Clubiona reclusa O.P. - Cambridge, 1863						0.46	0.58	0.19	
Clubiona sp.	0.29	1.82			0.64	0.30		0.38	
Zodarion germanicum (C.L. Koch, 1837)						0.15	0.29		
Drasodes pubescens (Thorell, 1856)		0.61		5.73				0.38	
Haplodrassus signifer (C.L. Koch, 1839)				0.64				1.32	
Micaria pulicaria (Sundevall, 1831)	0.29			0.64			0.58	0.19	
Zelotes subterraneus (C.L. Koch, 1833)	1.16	2.42		1.91		0.30	2.33		
Zora distincta Kulczynski, 1915							0.87		
Ozyptila trux (Blackwall, 1846)				2.55					
Xysticus cristatus (Clerck, 1757)	0.29								
Euophrys monticola Kulczynski, 1884					0.64		0.87	0.57	
Sitticus rupicola (C.L. Koch, 1837)				3.19	1.27	0.15	0.29		
Total	100.02	100.01	100.02	100.04	100.04	99.98	99.96	100.05	100.02
Abundance (number of specimens in 4 pf. traps)	346	165	360.66	157	157	659	344	530	173

Tab. 3 - Dominant activity of spider families on study sites in 1992.

Families	Transect 1				Transect 2		Transect 3			Transect 4 - Silvy vrch					
	st.1	st.2	st.3	st.4	st.5	st.6	st.7	st.8	st.9	st.10	st.11	st.12	st.13	st.14	st.15
Mimetidae	-	-	0.26	-	-	-	-	-	-	-	-	-	-	-	-
Theridiidae	-	-	-	-	-	1.66	0.58	0.61	3.24	-	-	-	-	-	-
Linyphiidae	44.38	40.21	77.18	12.20	97.14	69.18	68.50	52.72	82.64	64.34	79.00	90.58	54.34	60.21	75.16
Tetragnathidae	-	-	-	-	-	-	-	-	-	-	-	-	0.29	-	-
Argiopidae	-	-	-	-	-	-	-	-	-	-	0.64	-	-	0.19	-
Lycosidae	31.73	40.81	5.92	82.93	-	5.17	17.34	21.82	-	8.29	15.30	0.15	9.59	27.93	9.84
Cybaeidae	-	-	0.87	-	-	-	1.16	3.64	8.78	5.73	0.64	5.92	12.79	1.51	5.20
Agelenidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.58
Hahniidae	0.69	-	-	-	2.86	20.69	1.74	1.22	3.05	1.28	1.91	-	0.58	0.19	-
Amaurobiidae	7.59	2.09	5.05	2.44	-	3.32	8.38	13.94	2.31	5.74	-	1.67	16.56	6.99	9.25
Clubionidae	-	-	-	-	-	-	0.29	3.03	-	-	0.64	1.06	0.58	0.57	-
Zodariidae	-	-	-	-	-	-	-	-	-	-	-	0.15	0.29	-	-
Gnaphosidae	14.71	15.58	10.45	-	-	-	1.45	3.03	-	8.92	-	0.30	2.91	1.89	-
Zoridae	-	-	-	-	-	-	-	-	-	-	-	-	0.87	-	-
Thomisidae	0.92	1.35	-	2.44	-	-	0.29	-	-	2.55	-	-	-	-	-
Salticidae	-	-	0.26	-	-	-	0.29	-	-	3.19	1.91	0.15	1.16	0.57	-

Tab. 4 - Activity of abundance and composition of epigeic spider communities on study sites in 1992.

st.	A/10 m /1 day	n sp	eudominant sp (D> 10%)	dominan sp (5% <D> 10%)	rare species
1	7.80	16	P. s, M. r, H. s,	C. a, E. d,	
2	12.09	25	P. s, C. p, H. s, M. r,		C. b, P. p, S. a, X. a, X. 1, X. k,
3	20.67	19	C. p, M. r,	H. s,	E. m, P. p,
4	2.21	8	P. n,		
5	2.63	12	C. p, E. d,	B. l, D. c, L. m, L. t, L. v, M. r,	L. v,
6	14.04	16	C. p, B. l, Cr. c,		L. p,
7	25.99	26	C. p, P. n,	L. t, P. s,	H. d, L. p, W. i,
8	12.40	25	P. n, D. c, C. p,	L. p, C. a,	E. e, H. d, L. p,
9	27.09	15	C. p, D. l, L. t,	C. a,	
10	8.45	36	B. l, C. p,	L. t, C. a, D. p, G. r,	H. m, L. p,
11	8.45	25	C. p, G. r, L. t,	B. a, B. l, C. s, P. a,	D. h, E. m,
12	35.45	31	L. t, C. p, G. r,	C. s, C. a, B. l,	D. h, S. k,
13	18.50	36	C. a, L. t, C. p,	A. p, C. c, G. r,	E. m,
14	28.51	37	A. p, C. p, C. o,	C. s, C. t, M. r,	H. d, E. m, G. v,
15	12.99	21	C. p, C. s,	D. l, Co. a, G. r, L. t,	D. h,

st. - study site, A - abundance per 1day and 10m efective adge of pitfall traps, n - number, sp - species

A.p - *Alopecosa pulverulenta*
B.a - *Bolyphantes alticeps*
B.l - *B. luteolus*
C.a - *Cybaeus angustiarum*
C.b - *Centromerita bicolor*
C.c - *Callobius claustrarius*
C.o - *Cnephalocotes obscurus*
C.p - *Centromerus pabulator*
C.s - *C. sylvaticus*
C.t - *Coelotes terrestris*
Co.a - *C. atropos*
Cr.c - *Cryphoeca carpathica*
D.c - *Diplocephalus cristatus*
D.l - *D. latifrons*
D.p - *Drassodes pubescens*
E.d - *Erigone dentipalpis*
E.e - *Entelacara errata*
E.m - *Euophrys monticola*
G.r - *Goniatum rubellum*
G.v - *Gongylidiellum vivum*
H.d - *Hahnia difficilis*
H.m - *H. montana*
H.s - *Haplodrasus signifer*
L.m - *Lepthyphantes monticola*
L.p - *L. pulcher*
L.t - *L. tenebricola*
L.v - *L. varians*
M.r - *Meioneta rurestris*
P.a - *Pardosa amentata*
P.p - *Panammomops palmgreni*
P.s - *P. saltuaria*
S.a - *Scotinotylus antennatus*
S.k - *Saloca kulczynskii*
W.i - *Walckenaeria incisa*

The third subcluster (IIc) includes sites 14 and 15. Those sites have a well developed herbaceous cover and are on the slope of the Sivy vrch (they are located at the lowest altitude).

The third cluster (III) is represented by communities from site 4 and 8. Their formation is connected to the similarity of the site's character (lack of vegetation); such sites are prefered by the species *Pardosa nigra*. The similarity of such sites is only 25%, and is caused by the structure and quality of the underlayer (site 4 is the block stream and site 8 has schist debris covered with stones of various size mixed with soil).

The results from the classifications of the sites on the basis of Wischart's index. The method of Complete Linkage (Fig. 2b) has similar features to the UPGMA method. The only difference observed was in the case of site 9, which belongs to the subcluster IIc, and is similar to the community from site 15. Site 15 is situated in the vicinity of a spruce forest complex, and site 9 is situated inside that spruce forest.

When the communities collected May 25 (only 10 communities) and July 6-7, 1992 were compared, the similarity dendrogrames of abundance (WISCHART) had a similar character. Communities were distinguished into 2 clusters and site 4 remained isolated (Fig. 3a, b).

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