ACTA UNIVERSITATIS AGRICULTURAE ET SILVICULTURAE MENDELIANAE BRUNENSIS

Volume LX 6 Number 3, 2012

STRUCTURE AND DIVERSITY OF PSOCID TAXOCENOSES (INSECTA: PSOCOPTERA) IN THE FOREST ECOSYSTEMS OF THE *FAGETA ABIETIS* S. LAT. ZONE IN THE WESTERN CARPATHIAN MTS.

O. Holuša

Received: December 5, 2011

Abstract

HOLUŠA, O.: *Structure and diversity of psocid taxocenoses (Insecta: Psocoptera) in the forest ecosystems of the Fageta abietis s. lat. zone in the Western Carpathian Mts.* Acta univ. agric. et silvic. Mendel. Brun., 2012, LX, No. 3, pp. 51–60

Structure of psocid taxocenoses (*Psocoptera*) were studied in forest ecosystems of the Western Carpathian Mts. during 1997–2001. Vegetation tiers were used as a study frame. Lower units of forest site classification system (forest type complexes) were used for a classification of ecological conditions as well. Only a part of material, i.e. individuals that was found in the forest ecosystems of *Fageta abietis* s. lat. communities (= the 4th beech vegetation tier) was evaluated for purpose of this work. This vegetation tier is widespread in large part of Vsetínské vrchy hills, in the highest parts of Podbeskydská pahorkatina hills, and in the foothills of the Moravskoslezské Beskydy Mts. 1774 adults comprising 32 species were found in total in the 4th vegetation tier. As eudominant species, the following ones were found: *Caecilius flavidus* and *C. burmeisteri,* as dominant species, the following ones were found: *Philotarsus picicornis, Elipsocus moebiusi* and *Peripsocus subfasciatus.* In natural geobiocenoses with the level of naturalness of 1 or 2, the following species were found: as eudominant species: *Caecilius flavidus* and *Elipsocus moebiusi*, as dominant species, the following one was found: *Mesopsocus unipunctatum.* Taxocenoses of psocids were evaluated by Detrended Correspondence analysis (DCA) and Divisive Cluster analysis (DvClA). This material was compared to another material gained from various vegetation tiers in the Western Carpathians Mts. The characteristic species composition of psocids in the 4th vegetation tier was as follows: *Caecilius flavidus – Elipsocus moebiusi – Peripsocus parvulus.*

Psocoptera, taxocenoses, diversity, forest ecosystems, vegetation tier – *Fageta abietis* s. lat., the Moravskoslezské Beskydy Mts., the Western Carpathian Mts.

Order *Psocoptera* has not been in focus of faunistic or ecological studies. Complex psocopterological research was initiated recently by author in a territory of the Czech Republic and Slovakia in 1997. The aim of the systematic study of psocids conducted in the Western Carpathian Mts. was to define the species diversity and characteristic species composition of psocids in particular vegetation tiers (= altitudinal vegetation zone, further only VT) and to prove an applicability of vegetation zones or lower units of geobiocenological or forest + site classification systems in zoocenological studies.

Holuša (2001, 2003a, b, 2007b, c) published studies at ecological problem of psocid taxocenoses composition dependence on VTs in the Moravskoslezské Beskydy Mts., in the Podbeskydská pahorkatina hills (Holuša, 2005) and in the alluvium of the Odra river (the Protected landscape area of Poodří) (Holuša, 2007a).

The aim of presented article is to analyse composition and diversity of psocid taxocenoses of the 4th VT (*Fageta abietis* s. lat.) i.e. and to discuss the differences with other known VTs i.e. the 5th (*Abieti–fageta* s. lat.) (Holuša, 2009), the 6th (*Picei–fageta* s. lat.) (Holuša, 2011), the 7th (*Fageti–piceeta* s. lat.) and the 8th (*Piceeta* s. lat.) VTs (Holuša, 2007c).

The aim of this study is the using of frames and units of forest site classification system (according to Plíva, 1971, 1991; Holuša & Holuša, 2008, 2010, 2011) for zoocenological studies with a view to processing zoocoenoses characteristics for forest site units.

METHODS

The net of equally distributed geobiocenological research plots was situated in regions of eastern Moravia, eastern Silesia and northern Slovakia in the territory of Polonic and Westcarpathian biogeographical subprovinces (i.e. in the region of the Western Carpathian Mts.). Plots were selected in all VTs occurring in this region, i.e. from the 3rd (communities of *Querci–fageta* s. lat.) to the 9th (communities of *Pineta mugi* s. lat.) (cf. Holuša, 2003a). Plots were placed in such parts of forest stands which represent a particular VT and in which it was possible to collect a representative material of psocids. Approximately the same number of permanent plots was placed in all VTs. Permanent plots were marked out in the best-preserved parts of nature reserves (with the level of naturalness 1 or 2 according to Ellenberg (1973, 1978) and additional plots were selected in modified parts of nature reserves or in managed forests with the level of naturalness 3 or 4 according to Ellenberg (1973, 1978).

The material was obtained from permanent sampling sites during the vegetation period (from the beginning of May to the middle of September). The samples were collected by sweeping with a sweep net of 50 cm mouth in diameter. Branches of trees and bushes were beaten with the same sweep net in the extent of about 1 m from the branch end and up to approximately 2.5 m height. Individual collection of adults also complemented this method. During sweeping and beating, 30 sweepings or beatings were carried out in each locality. At one locality Malaise trap was installed - type of Townes (Townes, 1972). The trap is used primarily for capturing Diptera (Chvála, 1980). The material was collected about 3 times a month. Malaise trap was installed by the end of IV. the beginning of X. Caught psocids were sucked into an exhauster and stored in a small test tube with 70% alcohol. All samples were collected and identified by the author. The evidence material is deposited in 70% alcohol in the author's collection. Papers of Günther (1974) and Lienhard (1998) were used for identification; nomenclature, zoogeographical distribution and ecological demands were used according to Lienhard (1977, 1998).

Samples were sorted into vectors "habitats of psocids", where the following factors were taken into account: biogeographical region, ecological conditions (according to the forest type complexes) and tree or shrub species, from which the material was obtained (samples were also distinguished according to the capture method; captured either in a herb layer or by the Malaise trap). For example: *PB4Bbk*, where *PB* denotes the biogeographical region of the Podbeskydský region (cf. Culek, 1996), *4B* represents forest type complexes 4B (i.e. *Fagetum eutrophicum*) and *bk* is an acronym for the tree species *Fagus sylvatica*.

Material was collected at all localities in the same way, therefore dominance is calculated as the sum of all the methods for individual habitats. Malaise trap was evaluated as a separate habitat due to differences in obtaining material. Individual species are classified into classes according to the dominance of Tischler (1949). Dominance was first calculated the total for all geobiocenosis with varying degrees of nature, and then only for geobiocenosis natural (i.e. the degree of naturalness 1–2 according to Ellenberg 1973, 1978)).

Diversity was evaluated by Shannon-Wiener (H_S) and Brillouin diversity index (H_B). Both indexes, Shannon-Wiener and Brillouin, were computed according to Kaesler & Mulvany (1976a, b). Diversity indexes of individual habitats were calculated from a total number of captured specimens (Tab. 1). Some material was excluded from statistical processing because of a small number of collected specimens in some plots (i.e. species in a lower number than 5 specimens or 2 species even less than 3 specimens) to prevent a data distortion.

Detrended Correspondence Analysis – DCA

Detrended Correspondence Analysis (DCA), according to Gauch (1982), Hill (1974) and Hill & Gauch (1980), proceeds from the method of Principal Component Analysis (PCA), used for non-linear data. Axes were adjusted in order to prevent criteria deformation by the axis ends in the DCA-analysis. The unit length of axes corresponds with the average species dispersion. In different parts of axis it remains unchanged. The DCA ordination method has a quite heuristic character. Interpretation of axes and ordination positions of particular species is based on their ecology with a view to habitat characteristics. Modified SW Decorana was used to process the DCA analysis, which was adapted for zoocenological data processing (Povolný & Znojil, 1990).

Divisive Cluster Analysis – DvClA

Divisive Cluster Analysis (DvClA) represents a method of hierarchic divisive classification (Gower, 1967; Orlóci, 1975). The ordination of groups is performed twice by "Reciprocal averaging" (RA). All vectors are projected into the main axis as a super-ellipsoid. In the second phase, partial complexes of vectors are divided according to species ordinate in particular vectors and according to abundance of particular species (indicators) as well. These indicators are automatically selected by the program in compliance with the species spectrum of particular vectors (habitats) for the end parts of ordination axis. Used modification 'Twinspan algorithm' comes from a gradual division of habitats and species. Every processed file is ordinated by RA method, whereupon characteristic

I: *Values of Indexes of diversity and equitability for particular „habitats of psocids“ in the vegetation tier of Fageta abietis s. lat.*

biotope	Nsp	N	N				biotope	Nsp	N	N				biotope	Nsp	N	N			
			H_S	E_S	H_B	E_B				H_S	E_S	H_B	E_B				H_S	E_S	H_B	E_B
BE4Bbk	4	13	0.835	0.775	1.091	0.787	PB4Bsm	9	63	1.216	0.616	1.388	0.632	VS4Bjd	14	36	1.802	0.840	2.215	0.839
BE4Bdbl	4	52	0.837	0.658	0.925	0.667	PB4Dbk	3	15	0.356	0.395	0.485	0.442	VS4Blpm	2	15	0.181	0.309	0.245	0.353
BE4Bhb	3	36	0.628	0.632	0.709	0.645	PB4Ddbl	1	4	-	-	-	-	VS4Bos	4	8	0.727	0.743	1.074	0.774
BE4Bjd	2	4	0.347	0.774	0.562	0.811	PB4Djd	4	4	0.795	1.000	1.386	1.000	VS4Bpod	2	13	0.506	0.882	0.617	0.890
BE4Blpm	4	18	0.735	0.646	0.926	0.668	PB4Dsm	3	16	0.464	0.512	0.602	0.548	VS4Bsm	22	864	2.038	0.673	2.089	0.676
BE4Bdbl	2	3	0.366	1.000	0.637	0.918	PB4Hsm	2	13	0.197	0.344	0.271	0.391	VS4Btrn	5	43	0.896	0.622	1.025	0.637
BE4Bsm	1	9	-	-	-	-	PB4Wsvk	1	22	-	-	-	-	VS4Ddbz	2	6	0.299	0.598	0.451	0.650
PB4Ajlh	2	4	0.448	1.000	0.693	1.000	VS4Bbb	2	6	0.299	0.598	0.451	0.650	VS4Djd	4	18	0.774	0.680	0.974	0.702
PB4Ajs	1	32	-	-	-	-	VS4Bbk	4	44	0.384	0.305	0.462	0.333	VS4Dsm	8	15	1.329	0.865	1.807	0.869
PB4Ajv	2	4	0.347	0.774	0.562	0.811	VS4Bbo	6	8	1.152	1.000	1.733	0.967	VS4Ejb	2	9	0.398	0.741	0.530	0.764
PB4Bbk	6	41	0.765	0.484	0.914	0.510	VS4Bdbl	3	12	0.541	0.621	0.721	0.657	VS4Emd	3	5	0.599	0.881	0.950	0.865
PB4Bhb	3	24	0.444	0.464	0.544	0.495	VS4Bdbz	3	7	0.764	1.000	1.079	0.982	VS4Esvk	2	9	0.244	0.454	0.349	0.503
PB4Bjd	3	5	0.680	1.000	1.055	0.960	VS4Bhb	3	104	0.192	0.182	0.217	0.197	VS4Fbk	2	6	0.299	0.598	0.451	0.650
PB4Blpm	4	22	0.517	0.442	0.663	0.478	VS4Bhh	3	7	0.534	0.699	0.796	0.725	VS4Sjd	3	6	0.682	0.910	1.011	0.921
PB4Bma	8	16	1.350	0.860	1.808	0.869	VS4Bjb	6	19	0.924	0.646	1.202	0.671	VS4Ssm	7	31	1.304	0.793	1.553	0.798
PB4Bpod	2	16	0.173	0.293	0.234	0.337														

Nsp – number of species
N – number of specimens
H_S – Shannon-Wiener index of diversity
E_S – Equitability
H_B – Brillouin index of diversity
E_B – Equitability

species (or biotopes) are associated with axes ends. Central parts of axes are ordinated consequently. On the base of gained results, it is searched for species combinations, which are characteristic of parts of ordination axes and can be used as appropriate "tools for cuts" (Hill, 1974). This method was modified for the purpose of this study, because the first version was defined for phytocenological studies only. Column heads represent abbreviations of biotopes. Numbers in columns below indicate the division of appropriate algorithm (every habitat is divided, marked 0 or 1). There are species names in the left column and on the right there is one algorithm division of species spectrums in groups. The main field represents the semiquantitative relative frequency of particular species in groups corresponding with their biotopes. Explanations: – species does not occur, 1 – rare species, 2 – very scarce, 3 – scarce, 4 – common, 5 – very common to subdominant, 6 – dominant. Groups of psocid species and groups of habitats were organized to increase their clearness so that there is an evident species transfer within biotopes in the diagonal direction from the left upper corner to the right lower corner.

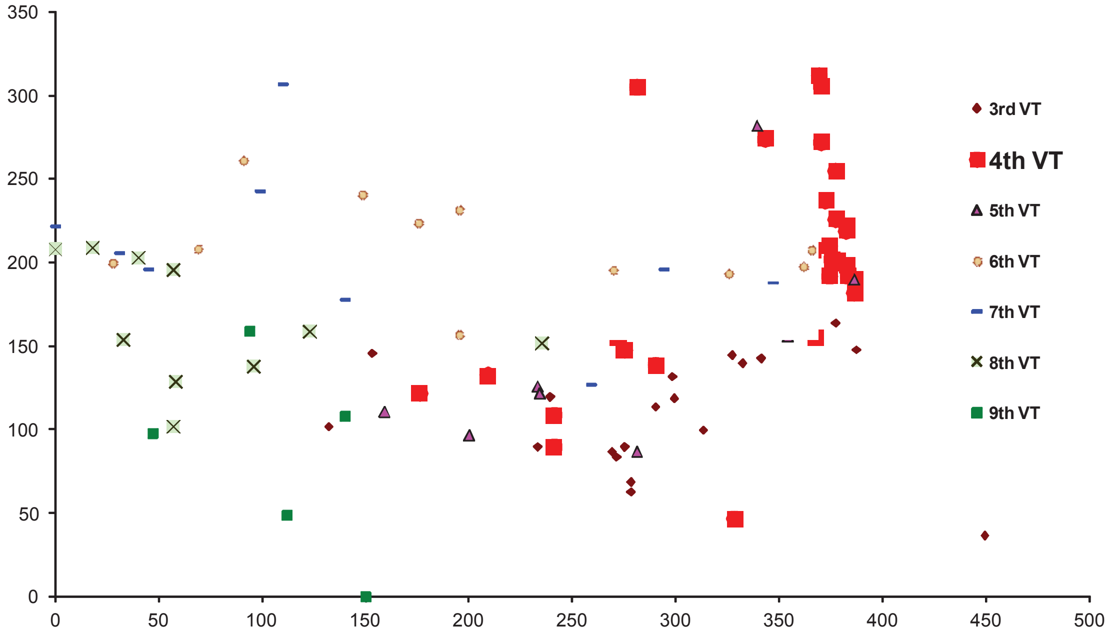
Acronyms of biogeographical regions: BE – biogeographical region of the Beskydský region, PB – biogeographical region of the Podbeskydský region, VS – biogeographical region of the Vsetínský region; codes of forest type complexes (according to Plíva 1971, 1991): 4S – *Fagetum mesotrophicum*, 4B – *Fagetum eutrophicum*, 4F – *Fagetum lapidosum mesotrophicum*, 4H – *Fagetum illimerosum trophicum*, 4W – *Fagetum calcarium*, 4D – *Fagetum acerosum deluvium*, 4A – *Tilieto-fagetum acerosum lapidosum*, for solitaire trees was used code of "4E" i.e. without classification of natural community; acronyms of trees and shrubs (investigated tree species): bb – *Acer campestre*, bk – *Fagus sylvatica*, bo – *Pinus sylvestris*, dbl – *Quercus robur*, dbz – *Quercus petraea*, hb – *Carpinus betulus*, hh – *Crataegus laevigata*, jb – *Malus sylvestris*, jd – *Abies alba*, jlh – *Ulmus glabra*, js – *Fraxinus excelsior*, jv – *Acer platanoides,* lpm – *Tilia cordata*, md – *Larix decidua*, os – *Populus tremula*, sm – *Picea abies*, sv – *Prunus domestica*, svk – *Cornus sanguinea*, trn – *Prunus spinosa*, ma – malaise trap, pod – undergrowth.

The characteristic of the 4th vegetation tier (*Fageta abietis* s. lat.)

According to Holuša & Holuša (2008) 4th VT (*Fageta abietis* s. lat.) represents geobiocenoses where *Fagus sylvatica* is a dominant species in natural conditions, it creates the main level of stands (the maximum the height over 50 m). *Abies alba* occurs in the co-dominant level, sporadically in the level exceeding the main level. It can reach the representation of ± 20% and the height of up to 50 m. *Quercus* sp. – *Quercus petraea* and *Quercus robur* – occur only as interspersed species with the representation to 10%, they do not reach the co-dominant tree level. *Carpinus betulus* is represented regularly, but in the forest stand structure only in the overtopped tree level. *Tilia cordata*, *Tilia platyphyllos*, and *Fraxinus excelsior* occur in the co-dominant tree level. Also *Acer platanoides*, *Acer pseudoplatanus*, *Ulmus glabra*, and *Padus avium* are co-dominant and overtopped tree levels. *Tilia cordata*, *Tilia platyphyllos*, and *Acer platanoides* have thein ecological optimum. The 4th VT occurs in the altitude from 300–640 m a.s.l. with the centre of occurrence in the interval of 380–440 m a.s.l., locally up to 680 m a.s.l. Soils arose on the flysh series of rocks of sandstones and shales, insular on the deluvial loams. There are represented the following soil types: Cambisols (typical, eutrophic, sporadically also dystric and pseudogley), are less frequent then podzols (cambic, typical). 4th VT occupies large areas in the Natural forest area (further only NFA) 41, coherent areas in the highest parts of NFA 39, and some proportions of the lowest parts of NFA 40. The most widespread communities in the study area are the following ones: Forest site type complex (further only FTC) 4B (*Fagetum eutrophicum*), FTC 4S (*Fagetum mesotrophicum*), and FTC 4D (*Fagetum acerosum deluvium*). 4th VT occurs on the 35.2% of the study area (including also non-forest land).

RESULTS AND DISCUSSION

1774 adults comprising 32 species were found in total in the 4th VT. The following eudominant species were found: *Caecilius flavidus, C. burmeisteri*, and as dominant species, the following ones were found: *Philotarsus picicornis, Elipsocus moebiusi* and *Peripsocus subfasciatus*. In natural geobiocenoses with the level of naturalness of 1 or 2, the following eudominant species were found: *Caecilius flavidus, Elipsocus moebiusi*. Dominant species was *Mesopsocus unipunctatum*. Resulting from the comparison of the tree colonization, the most numerous taxocenosis was found at *Picea abies,* which resulted in a significant change in dominance (see above). *Abies alba* was colonized by numerous taxocenoses, while the *Fagus sylvatica* inhabits the very poor range of psocids species in low abundances (see Tab. 1). In comparison with higher VTs (i.e. 5th and 6th), there was a change between species dominance. Eudominant species of 4th VT – *Caecilius flavidus*, occurs in the higher VTs only as dominant species. This representation is related to the change in tree species composition – reducing the representation of broadleave tree species in 5th and then more in 6th VT. Contrary species *Caecilius despaxi*, which in 4th VT occurs only sporadically, in 5th VT is scarce species, in the 6th VT becomes a eudominant species. Similarly, species *Mesopsocus unipunctatus* and *Stenopsocus lachlani* that occur rarely in the 4th, occur in 6th VT as a eudominant species. Resulting from the comparison of tree colonization, *Picea abies* was the most colonized tree species in all VT: 4th, 5th and 6th. In contrast to the tree species, *Abies alba* and *Fagus sylvatica,* which were colonised by lower number of species, u *Fagus sylvatica* also in lower abundances.



1: *DCA analysis of psocid biotopes with marked biotopes of Fageta abietis (4th VT) tier (axis x – gradient of vegetation tiers, axis q – gradient of hydricity)*

The DCA-analysis might be interpreted as follows: the *x*-axis denotes an influence of VTs i.e. vertical zonality and the *q*-axis refers to an influence of hydricity (cf. Holuša, 2007c). Habitats of 4th VT create a large dotted elongated as in the gravity gradient vegetation (x-axis) as well as hydricity gradient (q-axis) (see Fig. 1). Dotted field is quite similarly to the field of the 5th VT, but more elongated along the q-axis. Extensiveness of dotted field corresponds to the large number of different tree species and the nature of the studied sites in 4th VT. Dotted field in the *x* – *q* axis is shifted higher than field of the 3rd VT. From the viewpoint of hydricity, the field of 4th VT is larger than the field of 5th VT. Generally, habitats of 4th VT are "drier" than habitats of 3rd and 5th VTs.

Habitats of 4th VT are represented in more groups in the DvClA-analysis, according to species, where it was collected. Habitats of broad-leaf trees are sorted into following groups: A-I-b, individually in A-II-a-2 (see Fig. 2.). In the A-I-b group are habitats of 4th VT grouped into larger complexes. Habitats of coniferous are sorted into following groups: B-I-a, B-I-b and-II-a. Habitats of coniferous (especially *Picea abies*) are sorted into higher VTs. Habitats of 4th VT are represented in the widest possible scale, compared to other VTs, the 4th VT is the most diversified.

There were found higher values of diversity indexes in the 4B community for the VS4Bsm psocids biotope, i.e. H_S 1.52 and H_B 1.87, and high value was also found for the VS4Bjd psocid biotope, i.e. H_S 1.80 and H_B 2.21 (see Table 1). Generally speaking, the indexes of diversity H_S are in the interval of 0.18–2.04 and the H_B indexes are in the interval of 0.22–2.21.

The characteristic species combination of psocids for the 4th VT was established as follows: *Caecilius flavidus* – *Elipsocus moebiusi* – *Peripsocus parvulus*. Unlike 3rd VT species *Ectopsocus meridionalis* is missing in 4th VT. Also species *Enderleinella obsoleta, Cuneopalpus cyanops* and *Caecilius piceus* are characteristic for the 4th VT (like for the 5th VT). The "spruce" corticolous species are starting to dominate in the changed vegetation (i.e. spruce stands) such as *Caecilius burmeisteri, Philotarsus picicornis, Stenopsocus lachlani*, just that at this tree species "descend" to lower VTs.

Compared with species combinations of 5th VT, which was identified as follows: *Caecilius flavidus* – *C.burmeisteri* – *C.despaxi* – *Metylophorus nebulosus* – *Philotarsus picicornis*. *Elipsocus moebiusi* is missing in 5th VT, in contrast to 4th VT. The occurrence of *Caecilius despaxi* was found as the differential feature between 4th and 5th VTs. 6th VT has totally different species combination, which was as follows: *Caecilius despaxi* – *Stenopsocus lachlani* – *Mesopsocus unipunctatus* – *Reuterella helvimacula*. *Caecilius despaxi* which is clearly more dominant, in contrast to the 5th VT. And also *Reuterella helvimacula* is more dominant. There is a conspicuous change of characteristic psocid species, however also in the dominance of *Caecilius despaxi* diagnostic species which occurs in the 6th VT as a eudominant species.

In conclusion, it is the first step towards to the knowledge of taxocenoses of model group of psocids in the forest site classification frames – VTs, in this article the composition in the zone of *Fageta abietis* s. lat. The data is based on relatively small sample of the material, and should take in account the short-term of study (two growing seasons). It is therefore necessary to continue research and to monitor changes of psocid taxocenoses.

	PB4Bjd	OD1Lolx	**PB1Ldbl**	PB1Ljlv	PB3Los	**PB4Ajlh**	**PB4Ajv**	VS3Bjs	**VS4Bdbz**	**VS4Esv**	**PB4Bpod**	**VS4Bjb**	**BE4Bdbl**	**BE4Bbk**	**BE4Bhb**	**BE4Blpm**	BE5Fbk	BE5Ubk	BE6Fbk	OR6Bbk	PB3Hhb	PB3Hpod	**PB4Ajs**	**PB4Bbk**	**PB4Bhb**	**PB4Blpm**	**PB4Dbk**	**PB4Wsvk**	**VS4Bbb**	**VS4Bbk**	**VS4Bhb**	**VS4Blpm**	**VS4Ejb**	**VS4Fbk**	VS5Bbk	VS5Dbk	VS5Dsm	BE6Bbk	BE7Sbk	BE7Sjr	BE7Zbk	**VS4Ddbz**	VS5Fsm	**BE4Sdbl**	BE5Fpod	BE5Sjlv	OD1Uvrk	OP3Hpod	PB3Oma	**PB4Ddbl**	**VS4Bdbl**	**VS4Bpod**	**PB4Hsm**
Groups of biotopes	**A-I-b**																																																				
Elipsocus moebiusi	1	1	1	2	1	1	1	-	1	2	3	3	4	1	3	1	1	-	1	-	1	1	-	1	1	1	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mesopsocus laticeps	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stenopsocus immaculatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stenopsocus stigmaticus	-	1	1	2	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caecilius flavidus	-	2	1	2	1	1	1	1	1	1	1	1	3	2	4	3	4	3	4	2	3	3	4	4	4	3	3	4	2	4	5	3	2	2	4	2	2	2	2	1	3	2	1	1	1	1	1	1	1	1	2	1	1
Elipsocus pumilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amphigerontia contaminata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caecilius gynapterus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lachesilla quercus	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ectopsocus meridionalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Graphopsocus cruciatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Psococerastis gibbosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	1	-	-
Peripsocus phaeopterus	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Philotarsus parviceps	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peripsocus subfasciatus	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caecilius atricornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-
Peripsocus parvulus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Trichadenotecnum majus	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Blaste quadrimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kolbia quisquiliarum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Epipsocus lucifugus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liposcelis corrodens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Elipsocus abdominalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Enderleinella obsoleta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hemineura dispar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reuterella helvimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caecilius piceus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peripsocus didymus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peripsocus alboguttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metylophorus nebulosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loensia fasciata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loensia variegata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caecilius fuscopterus	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Elipsocus hyalinus	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stenopsocus lachlani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trogium pulsatorium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caecilius burmeisteri	1	-	-	1	-	-	-	1	-	-	-	-	1	-	1	-	-	1	1	-	-	-	-	1	-	1	1	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	1	1	-	-	1	-	-	-	-
Loensia pearmani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Philotarsus picicornis	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Cuneopalpus cyanops	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Amphigerontia bifasciata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichadenotecnum sexpunctatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lachesilla pedicularia	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-
Mesopsocus unipunctatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
Caecilius despaxi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1
	0	1	1	1	1	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1

	OP3Hdbl	OP3Hhb	OP3Hjb	OP3Hjlv	OP3Hlis	PB3Lolx	OD1Ldbl	OD1Ltrn	**VS4Btrn**	BE5Bbk	BK3Bhb	OD1Lbb	OD1Lhb	OD1Lhh	OD1Ljs	OD1Ljv	OD1Llpm	OD1Lstr	OD1Lvrk	OP3Hlpm	PB2Ldbl	PB2Lolx	PB2Lstr	PB2Lvrk	PB3Ghb	PB3Gjs	PB3Glpm	PB3Lbc	PB3Ldbl	PB3Ljlh	PB3Lvrp
Groups of biotopes	**A-II-a-1**																														
Elipsocus moebiusi	4	1	1	-	1	2	1	1	-	1	-	1	1	-	1	-	1	-	-	1	1	1	-	-	1	1	1	1	3	-	1
Mesopsocus laticeps	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	1	-	-
Stenopsocus immaculatus	-	-	-	-	-	1	1	1	-	-	-	1	1	1	1	1	1	2	1	-	2	1	2	-	3	-	3	1	1	-	1
Stenopsocus stigmaticus	-	1	-	-	-	1	3	4	-	-	-	1	2	2	3	1	2	1	2	-	3	1	3	4	1	1	3	1	2	1	1
Caecilius flavidus	4	4	2	-	2	1	6	4	4	2	1	2	4	2	4	3	4	2	3	3	4	2	2	2	3	-	3	1	5	1	1
Elipsocus pumilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amphigerontia contaminata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caecilius gynapterus	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lachesilla quercus	2	1	-	1	-	-	2	-	-	-	-	1	1	-	-	1	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
Ectopsocus meridionalis	1	1	-	1	-	-	1	-	-	-	-	-	1	1	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-
Graphopsocus cruciatus	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-
Psococerastis gibbosa	1	-	-	-	-	1	1	-	-	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-
Peripsocus phaeopterus	3	1	1	1	1	1	3	3	2	-	1	1	1	-	1	1	1	1	1	1	1	1	1	1	2	-	-	1	2	1	1
Philotarsus parviceps	4	1	2	3	2	4	2	2	2	-	1	1	1	1	1	-	1	1	1	1	-	-	-	1	1	1	1	1	2	1	2
Peripsocus subfasciatus	5	3	4	2	4	2	3	4	-	1	1	2	3	3	1	1	2	2	1	1	1	1	2	1	1	-	2	2	1	1	1
Caecilius atricornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Peripsocus parvulus	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Trichadenotecnum majus	3	1	1	-	1	1	-	-	-	1	-	-	-	-	1	-	-	-	1	1	-	1	1	1	-	-	1	1	1	-	-
Blaste quadrimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kolbia quisquiliarum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Epipsocus lucifugus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Liposcelis corrodens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Elipsocus abdominalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Enderleinella obsoleta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hemineura dispar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reuterella helvimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caecilius piceus	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peripsocus didymus	1	1	1	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Peripsocus alboguttatus	-	-	-	-	-	-	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metylophorus nebulosus	3	1	1	1	1	1	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Loensia fasciata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loensia variegata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caecilius fuscopterus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Elipsocus hyalinus	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-
Stenopsocus lachlani	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Trogium pulsatorium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caecilius burmeisteri	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loensia pearmani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Philotarsus picicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Cuneopalpus cyanops	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amphigerontia bifasciata	1	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichadenotecnum sexpunctatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lachesilla pedicularia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mesopsocus unipunctatus	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Caecilius despaxi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2: *Results of DvClA-analysis 'Twinspan algorithm'; biotopes of the 4th are marked with vertical columns with grey color (with regard to the table extent, central and right parts of the whole graph is illustrated only)*

Groups of biotopes	A-II-a-1															A-II-a-2																										B-I-a															B-I-b															
	VS4Ssm	OD1Lbc	OD1Ljh	OD1Lols	OP1Loll	OP3Hkl	PB1Ljiv	PB2Lbc	PB2Ljiv	PB2Llis	PB2Loll	PB3Gbc	PB3Lkro	PB3Lsm	PB3Lstr	BK2Ctrn	OP1Lvrk	PB3Lkl	**VS4Bos**	BE6Obk	BK2Cdbp	BK3Bdbz	OD1Lkl	OP3Hbk	OP3Hkro	PB3Hbk	PB3Hdbl	VS3Lols	VS3Lolx	BE5Ejb	**PB4Djd**	PB1Tkro	PB1Toll	PB1Tvrp	PB2Ltrn	PB3Hlpm	PB3Loll	BE5Hsm	PB2Lsm	VS5Bsm	**VS4Bsm**	BE6Psm	BE6Rsm	**VS4Bbo**	**BE4Bjd**	OP3Hsm	VS3Lsm	**VS4Bjd**	BE6Ojiv	**PB4Bma**	BE6Pjd	BE6Ppod	BK3Bsm	**BK4Bsm**	OR6Bjd	OD1Lsm	BE5Hsm	PB2Lsm	VS5Bsm	**VS4Bsm**	BE6Psm	BE6Rsm	BE5Lsm	BE5Ssm	BE6Osm	BE5Bjd	BE5Bsm	BE5Nsm	BE6Pbk	**PB4Bsm**	PB3Hma	PB3Hsm
Elipsocus moebiusi	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	2	-	-	3	1	2	1	1	1	1	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mesopsocus laticeps	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	1	-	2	4	1	1	1	1	-	-	-		-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Stenopsocus immaculatus	1	-	-	1	-	-	1	1	1	1	-	-	-		1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stenopsocus stigmaticus	-	-	-	1	-	-	2	1	2	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caecilius flavidus	1	1	1	-	-	1	1	1	1	1	1	-	1		-	1	1	1	1	1	1	1	1	1	1	1	1	2	1	-	-	1	1	1	-	3	-	-	1	1		-	-	-	-	-	-	1	1	2	-	-	-	-	-	-	-	1	1	2	-	-	-	-	-	-	-	-	1	1	3	1
Elipsocus pumilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Amphigerontia contaminata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caecilius gynapterus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lachesilla quercus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Ectopsocus meridionalis	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Graphopsocus cruciatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Psococerastis gibbosa	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-
Peripsocus phaeopterus	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	1	1	2	1	1	1	-	1	-	1	1	1	1	-	-	2	1	1	1	2	-	-	1	-		-	-	-	-	-	-	1	1	-	1	-	-	-	-	1	-	1	-	4	-	-	-	2	-	-	-	-	-	-	1	1
Philotarsus parviceps	1	-	-	-	-	1	-	-	-	-	-	1	2		-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	3	1	-	-	1	2	3	1	-		1	4	-	-	-	-	-	-	-	-	-	2	-	-	6	3	1	-	2	1	4	1	-	1	-	-	-	-	-	-	-
Peripsocus subfasciatus	3	1	1	1	1	1	2	1	1	-	-	1	-		-	-	-	-	-	-	-	1	1	1	1	-	1	1	1	-	1	1	1	1	-	-	1	5	3	5		3	6	-	-	4	2	1	1	1	-	-	-	1	-	1	5	3	5	5	3	6	1	1	2	3	-	1	-	-	2	1
Caecilius atricornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
Peripsocus parvulus	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	1	-		-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	3	-	-	-	-	1	-	-	1	-	-	-	-
Trichadenotecnum majus	-	-	-	-	1	1	-	-	1	1	1	-	-		1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	1	-	1	-	-	-	-	1	1	-		-	3	-	-	1	-	1	1	1	-	-	-	-	-	1	1	1	-	2	-	3	1	2	1	1	1	-	2	1	1	-
Blaste quadrimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kolbia quisquiliarum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Epipsocus lucifugus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Liposcelis corrodens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Elipsocus abdominalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Enderleinella obsoleta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1		4	6	-	-	1	-	1	1	-	-	-	-	-	-	-	1	1	1	5	4	6	3	2	4	1	1	-	1	2	1	3
Hemineura dispar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Reuterella helvimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Caecilius piceus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-	-	-	3	3	1		5	5	-	-	3	-	-	1	1	1	1	-	-	1	1	3	3	1	5	5	5	1	2	1	-	1	-	1	2	6	2
Peripsocus didymus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-		3	3	-	-	-	1	1	-	-	1	-	-	-	-	-	-	1	-	4	3	3	4	4	2	-	-	-	-	1	-	1
Peripsocus alboguttatus	-	1	-	-	-	-	1	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	6	1	-	-	-	2	4	-	-	1	-	-	-	-	-	2	-
Metylophorus nebulosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	1	-	-	-	1	-	-	-	3	1	1		2	2	1	-	1	-	1	-	-	2	1	2	2	1	-	3	1	1	4	2	2	-	4	-	2	-	1	1	1	1	1
Loensia fasciata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	1				-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	1	2	-	-	-	1	-	-	-	-	-	-	-	-
Loensia variegata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Caecilius fuscopterus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
Elipsocus hyalinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	1	4	-	1	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Stenopsocus lachlani	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	2	1		4	5	-	-	-	-	-	1	1	1	-	-	-	1	1	1	2	1	2	4	5	3	5	1	1	-	-	1	1	6	4
Trogium pulsatorium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caecilius burmeisteri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	1	-	-	-	-	2	2	4		6	6	-	1	2	-	2	1	1	1	1	1	3	2	3	2	2	4	6	6	6	2	6	1	3	5	4	3	4	4	3
Loensia pearmani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Philotarsus picicornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	3	4		4	6	1	-	-	-	1	-	-	1	-	-	-	1	1	5	3	4	6	4	6	3	5	2	-	2	1	1	-	-	-
Cuneopalpus cyanops	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2		1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	2	5	1	-	-	1	-	-	-	-	-	-	-	-
Amphigerontia bifasciata	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3	5	2	-	-	-	-	-	-		2	3	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	2	3	1	2	-	1	-	-	-	-	-	-
Trichadenotecnum sexpunctatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lachesilla pedicularia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-		-	-	-	-	1	-	-	1	-	-	-	-	-	-	2	1	1	-	1	-	-	-	1	-	-	-	-	-	-	-	-
Mesopsocus unipunctatus	2	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	1	-	1	-	1		1	-	-	-	2	1	1	-	-	-	-	-	-	-	3	1	-	1	4	1	-	-	2	-	-	-	-	-	-	-	1
Caecilius despaxi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-		3	6	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	1	3	6	4	4	3	1	-	1	-	1	-	-
	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1	1	1	1	1	1		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1		1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0		1	1		1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1
	0	1	1	1	1	1	1	1	1	1	1	1	1		1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	0	0	0		0	0		0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	1	1	1	0	1	1	1	1		

2: *continuation*

	VS4Dsm	VS4Emd	BE5Sbk	BE6Sbk	PB4Dsm	BE4Ssm	OR8Zjan	VS3Ltm	VS5Asm	VS5Bjd	BE6Spod	BE7Spod	OR5Sjd	BE8Zpod	OR8Zkos	OR6Bsm	BE5Fjd	BE5Fsm	BE6Gsm	BE7Fbk	VS4Djd	VS4Sjd	BE5Sjd	BE6Fsm	BE6Sjd	BE6Ssm	BE6Zsm	BE7Fsm	BE7Sjv	BE7Ssm	BE7Zsm	BE8Zbk	BE8Zkos	BE8Zma	BE8Zsm	OR7Ssm	OR8Sjr	OR8Ssm	OR8Zsm	OR9Kkos	OR9Ksm	
Groups of biotopes						B-II-a-1							B-II-a-2																B-II-b-1													
Elipsocus moebiusi	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 0 0 1
Mesopsocus laticeps	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 0 0 1
Stenopsocus immaculatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 0 0 0
Stenopsocus stigmaticus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 0 0 0
Caecilius flavidus	-	-	4	3	1	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	1	1	-	-	-	1	-	-	1	1	1	1	1	-	-	-	-	-	-	0 0 1 0
Elipsocus pumilis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 0 1 0
Amphigerontia contaminata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 0 1 1
Caecilius gynapterus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 1 0 0 0
Lachesilla quercus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 1 0 0 0
Ectopsocus meridionalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 1 0 0 1
Graphopsocus cruciatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 1 0 1 0
Psococerastis gibbosa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 1 0 1 0
Peripsocus phaeopterus	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 1 0 1 1
Philotarsus parviceps	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0 1 0 1 1
Peripsocus subfasciatus	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	0 1 1 0 0
Caecilius atricornis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 1 1 0 1
Peripsocus parvulus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0 1 1 0 1
Trichadenotecnum majus	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0 1 1 1
Blaste quadrimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 0 0 0
Kolbia quisquiliarum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 0 0 0
Epipsocus lucifugus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 0 0 1 0
Liposcelis corrodens	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 0 0 1 0
Elipsocus abdominalis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 0 0 1 1
Enderleinella obsoleta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 0 0 1 1
Hemineura dispar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 0 0 1 1
Reuterella helvimaculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 0 0 1 1
Caecilius piceus	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1 1 0 1
Peripsocus didymus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1 1 0 1
Peripsocus alboguttatus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 1 0
Metylophorus nebulosus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 1 1 0 0
Loensia fasciata	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 1 1 0 1
Loensia variegata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 1 1 0 1
Caecilius fuscopterus	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 1 1 1
Elipsocus hyalinus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 1 1 1 1
Stenopsocus lachlani	1	-	-	1	-	-	-	-	-	-	-	1	1	-	3	-	-	-	1	-	1	1	1	1	1	5	1	3	-	4	5	1	1	4	5	2	2	6	5	2	5	1 0 1 0 0
Trogium pulsatorium	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 0 1 0 0
Caecilius burmeisteri	1	1	2	3	3	2	1	2	2	2	1	1	1	1	1	3	3	4	-	-	-	-	3	2	2	5	1	3	-	4	3	-	1	1	4	-	-	4	5	-	6	1 0 1 0 1
Loensia pearmani	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 0 1 1 0
Philotarsus picicornis	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	2	2	3	3	-	-	-	-	1	-	3	-	3	-	2	2	-	-	-	4	2	-	1	1	-	1	1 0 1 1 0
Cuneopalpus cyanops	1	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 0 1 1 1
Amphigerontia bifasciata	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	5	1	-	-	1	1	-	1	4	1	-	1	1 0 0 0
Trichadenotecnum sexpunctatum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 0 0 1 0 0
Lachesilla pedicularia	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	3	-	1	1	1	1	-	3	-	-	-	1	-	2	1 0 0 1 0 1
Mesopsocus unipunctatus	2	-	1	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-	-	2	3	1	2	3	4	5	1	5	1	4	5	-	-	1	5	1	-	1	2	-	3	1 0 0 1 0 1
Caecilius despaxi	-	-	1	1	-	-	1	-	-	-	-	-	-	1	1	1	3	4	-	-	-	-	3	2	2	6	2	5	3	6	6	1	3	6	6	2	2	6	2	1	4	1 0 0 1 1
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0	0	1	1	1	1	1	1	1	1	0	0	0	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
			1	1	1	0	0	0	0	0	0	0	1			0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

2: *continuation*

CONCLUSION

The results of this work with previous results for the 5th *Abieto–fageta* s. lat. (Holuša, 2009), 6th *Piceeti–fageta* s. lat. (Holuša, 2011), 7th *Fageti–piceeta* s. lat and 8th *Piceeta* s. lat. VTs (Holuša, 2007c) create a survey of compositions of psocid taxocenoses in the majority of VTs in the Western Carpathian Mts.

The 4th VT is a community of *Fageta abietis* s.lat. with large richness of tree edificators, therefore there is also larger diversity types of forest stands. With regard to richness and abundance of psocid species, 4th VT is the richest. Compared to psocid taxocenoses, there is a noticeable difference to the higher VTs, which also corresponds phytocenological consequently geobiocenological characteristics of VTs.

This work verifies the hypothesis that units of geobiocenological or forest-typological system i.e. at first VTs, have proved to be a suitable frame for zoocenological studies. These units, as characteristics of a potential state of ecosystems, together with the description of the present tree species composition and the level of naturalness form a perfect base for studies focused on the animal taxocenoses structure. Therefore VTs are an ideal frame for animal (entomological) studies. And on the other side, the order of psocids can be used for geobiocenological classification of ecosystems and also for evaluation of potential ecosystem changes.

Acknowledgement

This paper was worked up in the frame of the research project „Strategy of the management of territories with a special protection status“ MSM 6215648902-04 of Faculty Forestry and Wood Technology of Mendel University in Brno.

REFERENCES

CULEK, M., (ed.), 1996: Biogeografické členění České republiky. Enigma, Praha: 347.

CHVÁLA, M., (ed.) 1980: Fauna ČSSR – Krevsající mouchy a střečci – Diptera. Academia, Praha: 540.

ELLENBERG, H., (ed.), 1973: Ökosystemforschung. Springer Verlag Berlin – Heidelberg – New York: 282. (sec. rec. in MÍCHAL, 1994).

ELLENBERG, H., 1978: Vegetation Mitteleuropas mit dem Alpen in ökologischer Sicht. Eugen Ulmer, Stuttgart: 943. (sec. rec. In MÍCHAL, 1994).

GAUCH, H. G., jr., 1982: Nose reduction by eigenvector ordinations. Ecology, 63: 1643–1649.

GOWER, J. C., 1967: A comparsion of some methods of cluster analysis. Biometrics, 23: 623–637.

GÜNTHER, K. K., 1974: Die Tierwelt Deutschlands. 61. Teil. Staubläse, Psocoptera. VEB Gustav Fischer, Jena: 314.

HILL, M. O., 1974: Correspondence analysis – a neglected multivariate method. Applied Statistics, 23: 340–354.

HILL, M. O., GAUCH H. G., jr., 1980: Detrended correspondence analysis: an improved ordination technique. Vegetatio, 42: 47–58.

HOLUŠA, O., 2001: Příspěvek k poznání fauny pisivek (Insecta: Psocoptera) Přírodní rezervace Smrk (Beskydský bioregion, Česká republika). Práce a Studie Muzea Beskyd, 11: 83–97.

HOLUŠA, O., 2003a: Vegetační stupňovitost a její bioindikace pomocí řádu pisivek (Insecta: Psocoptera). [Disertační práce]. Mendelova zemědělská a lesnická univerzita, Lesnická a dřevařská fakulta, Brno: 258.

HOLUŠA, O., 2003b: Fauna pisivek (Insecta: Psocoptera) Národní přírodní rezervace Mazák (Beskydský bioregion, Česká republika). Práce a Studie Muzea Beskyd (Přírodní vědy), 13: 83–98.

HOLUŠA, O., 2005: Fauna pisivek (Insecta: Psocoptera) Přírodní památky Kamenec v Podbeskydské pahorkatině (Podbeskydský bioregion, Česká republika). Práce a Studie Muzea Beskyd (Přírodní vědy), 15: 75–89.

HOLUŠA, O., 2007a: Fauna pisivek (Insecta: Psocoptera) vybraných lokalit Poodří (Pooderský bioregion, Česká republika). Práce a Studie Muzea Beskyd (Přírodní vědy), 19: 105–126.

HOLUŠA, O., 2007b: Příspěvek k poznání fauny pisivek (Insecta: Psocoptera) Přírodní rezervace V Podolánkách v Moravskoslezských Beskydech (Beskydský bioregion, Česká republika). Práce a Stud. Muz. Beskyd (Přír. vědy), 19: 127–141.

HOLUŠA, O., 2007c: The influence of tree species composition to the composition of psocid taxocenoses (*Insecta: Psocoptera*) in the 7th (= *Fageti-Piceeta* s. lat.) and 8th altitudinal vegetation zones (= *Piceeta* s. lat.) in the Moravskoslezské Beskydy Mts. Journal of Forest Science, 53, (Special Issue): 3–10.

HOLUŠA, O., 2009: Composition and diversity of psocid (*Insecta: Psocoptera*) taxocoenoses in forest ecosystems of the *Abieti-fageta* s. lat. zone in the Western Carpathian Mts. Journal of Forest Science, 55: 184–192.

HOLUŠA, O., 2011: Psocid taxocenoses structure and diversity (Insecta: Psocoptera) in the forest ecosystems of the *Piceeti-fageta* s. lat. zone in the Western Carpathian Mts. Acta universitatis agriculturae et silviculturae Mendelianae Brunensis, 59 (5): 95–103.

HOLUŠA, O., HOLUŠA, J., st., 2008: Characteristics of 3rd (*Querci-fageta* s. lat.) and 4th (*Fageta (abietis)* s. lat.) vegetation tiers of north-eastern Moravia and Silesia (Czech Republic). Journal of Forest Science, 54: 439–451.

HOLUŠA, O., HOLUŠA, J., st., 2010: Characteristics of 5th (*Abieti-fageta* s. lat.) and 6th (*Picei-fageta* s. lat.) vegetation tiers of north-eastern Moravia and Silesia (Czech Republic). Acta Musei Beskydensis, 2: 49–62.

HOLUŠA, O., HOLUŠA, J., st. 2011: Characteristics of 7th (*Fageti-piceeta* s. lat.), 8th (*Piceeta* s. lat.) and 9th (*Pineta mugo* s. lat.) vegetation tiers of northeastern Moravia and Silesia (Czech Republic). Acta Musei Beskydensis, 3: 1–15.

KAESLER, R. L., MULVANY, P. S., 1976a: Fortran IV program to compute diversity indices from information theory. Computer Geosciences, 2: 509–514.

KAESLER, R. L., MULVANY, P. S., 1976b: Fortran IV program to compute replicated diversity indices for random samples of specified size. Computer Geosciences, 2: 515–519.

LIENHARD, C., 1977: Die Psocopteren des Schweizerischen Nationalparks und seiner Umgebung (Insecta: Psocoptera). Ergebnisse der wissenschaftlichen Untersuchungen im Schweizerischen Nationalpark, band 14 (Nr. 75): 417–551.

LIENHARD, C., 1998: Psocoptéres Euro-méditerranéens. Faune de France. Vol 83. Fédération Francaise des Sociétes de Sciences naturelles, Paris: 517.

MÍCHAL, I., 1994: Ekologická stabilita. 2. vyd. Veronica a Ministerstvo životního prostředí ČR, Brno: 275.

ORLÓCI, R., 1975: Multivariate analysis in vegetation research. Dr. W. Junk Publishing, The Hague – Boston: 451.

POVOLNÝ, D., ZNOJIL, V., 1990: Vergleich zwischen Sarcophagini-Taxozönosen (Insecta, Diptera) Thürigens und der Tschechoslowakei. Rudolstädter Naturhistorische Schriften, 3: 43–61.

PLÍVA, K., 1971: Typologický systém ÚHÚL. Ústav pro hospodářskou úpravu lesů Brandýs nad Labem, Brandýs nad Labem: 90.

PLÍVA, K., 1991: Funkčně integrované lesní hospodářství. 1 – Přírodní podmínky v lesním plánování. Ústav pro hospodářskou úpravu lesů Brandýs nad Labem, Brandýs nad Labem: 263.

TISCHLER, W., 1949: Grundzüge der terrestrischen Tierökologie. F. Vieweg & Sohn, Braunschweig: 219.

TOWNES, H., 1972: A light-weight Malaise trap. Entomological News, 83: 239–247.

Address

doc. Ing. Otakar Holuša, Ph.D., Ústav ochrany lesa a myslivosti, Mendelova univerzita v Brně, Zemědělská 1, 613 00 Brno, Česká republika, e-mail: holusao@email.cz