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Ruderal Vegetation of the Horná Orava Region 1. *Bidentetea tripartitae*, *Polygono arenastri-Poetea annuae*, *Molinio-Arrhenatheretea*, *Stellarietea mediae* and *Artemisietea vulgaris*

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Abstract: First part of results of research on ruderal vegetation of the Horná Orava region, located on the northern border of Slovak Republic, is being summarised, namely classes *Bidentetea tripartitae*, *Polygono arenastri-Poetea annuae*, *Molinio-Arrhenatheretea*, *Stellarietea mediae* and *Artemisietea vulgaris*. Research started at 80s of 20th century and ended recently. In total twenty associations and seven communities have been recorded. Based on phytoceonological tables, their characteristics, floristic composition, ecological conditions, distribution and comparison to data, published from southern regions of Slovakia, are presented. In general, communities lacked many xerothermophilous species found in the South of Slovakia and instead mesophilous species were more represented.

Keywords: synanthropic vegetation, Northern Slovakia, numerical classification, syntaxonomy.

Introduction

Synanthropic vegetation is vegetation growing on places affected by various human activities and its development directly depends on the type of such

activities. Though often overlooked by many syntaxonomists and plant ecologists, it is very dynamic, heterogeneous and viable type of vegetation. According to the regime of human activity, ruderal communities are usually divided into two groups: ruderal (vegetation of irregularly disturbed places) and segetal (weed communities of ± regularly cultivated lands).

Research on synanthropic vegetation of Slovakia began after the World War II (KRIPPELOVÁ 1975). JAROLÍMEK et al. (1997) describe in details development of the research on synanthropic vegetation in the Slovakia (formerly part of Czechoslovakia). Information was gathered systematically. During first decades the scientists were focused on synanthropic vegetation of smaller regions. We will mention just few more elaborative works (e.g. ZALIBEROVÁ 1971; KRIPPELOVÁ 1972, 1981; ELIÁŠ 1974; PASSARGE & JURKO 1975; HILBERT 1981; JAROLÍMEK & ZALIBEROVÁ 1995; JAROLÍMEK & KLIMENT 2000; JAROLÍMEK et al. 2007), for more details see KRIPPELOVÁ (1975) and JAROLÍMEK et al. (1997). When sufficient amount of data was collected, further synthetic studies could be made. JAROLÍMEK et al. (1997) have written synopsis on synanthropic vegetation of Slovakia, which was supplemented with data on order *Convolvuletalia sepii* by JAROLÍMEK & ZALIBEROVÁ (2001).

Despite the vast number of publications dedicated to synanthropic vegetation of various regions, there was almost no information about the Horná Orava region until the 80s of 20th century, when JAROLÍMEK & ZALIBEROVÁ have conducted a survey on synanthropic vegetation and primarily vegetation of bared bottom of Orava dam during the drain off, reparation and cleaning of the basin. Synthesis of the results has not been finished; even though partial results on vegetation of barred bottom have been published (JAROLÍMEK & ZALIBEROVÁ 1991) and the data were partially included in the above-mentioned synopsis. Therefore we started new survey to update and fill these data. It was concentrated only on the ruderal vegetation. The aim of this paper is to present the first part of the results of evaluation of the older and recent data on synanthropic vegetation of the Horná Orava region, namely classes *Bidentetea tripartitae*, *Polygono arenastri-Poetea annuae*, *Artemisietea vulgaris* and the ruderal part of *Molinio-Arrhenatheretea* and *Stellarietea mediae*. It shall be supplemented by the second part on *Galio-Urticetea* and *Epilobietea angustifolii*.

Study Area

Relatively mountainous and rural region Horná Orava is located on the north-western border of the Slovak Republic and Poland. Studied area includes orographic units Oravské Beskydy Mts, Podbeskydská brázda trench, Podbeskydská vrchovina highlands, Oravská kotlina basin, Oravská Magura Mts, Oravská vrchovina highlands and Skorušinské vrchy Mts (in case of the class *Epilobietea angustifolii*), based on Databank of Slovak Fauna (www.dfs.sk). The bedrock consists primarily of sandstones, claystones, conglomerates and shales, creating flysch bed, divided to Inner (Inner Carpathian Paleogene) and Outer (Magura Flysch belt) Carpathians by Pieniny Klippen belt (MIKLÓS 2002). In the

ruderal habitats prevail anthropogenic soils of various categories (KRIPPELOVÁ 1971) and on the clearings cambisols.

The area belongs to temperate moderately cool climatic region (MIKLÓS 2002) with average temperatures in January from -4˚C to -7˚C. In July average temperature ranges from 12˚C to 16˚C. Mean precipitation levels are fairly high from 700 to 1600 mm. Reconstructed natural vegetation consists of submontane and montane floodplain woods, herb-rich beech and fir forests, fir-spruce forests, oak-hornbeam forests with lime-tree, spruce waterlogged forests, montane acidophilous beech forests, montane maple forests, Carpathian oak-hornbeam forests and submontane beech woods with forb-rich undergrowth (MICHALKO et al. 1986). Recently planted spruce forests prevail. Most of the studied area belongs to the protected landscape area Horná Orava, valued for its peat bogs, old spruce forests and rich avifauna.

Data Sampling

The total amount of 351 relevés of ruderal vegetation was used, 226 unpublished recent data recorded by MEDVECKÁ & JAROLÍMEK (2005-2008), the rest are older, most of them made in 80s and 90s of the previous century and their authors are JAROLÍMEK (89), ZALIBEROVÁ (34 relevés), GREBENŠČIKOV et al. (1956) (1) and KLIMENT (1). Data were sampled according to the methods of Zürich-Montpelliere school (BRAUN-BLANQUET 1964; WESTHOFF & VAN DEN MAAREL 1978). Extended Braun-Blanquet 10-degree cover-abundance scale was used (BARKMAN et al. 1964). In addition locality data were recorded for each relevé, including altitude, latitude, longitude, steepness and orientation of slope, total cover, cover of each layer, height of each layer, bedrock, type of soil and habitat.

Evaluation

All the relevés were imported into Turbowin, database program for storing of phytosociological data (HENNEKENS & SCHAMINÉE 2001), and consecutively edited in the program Juice (TICHÝ 2002). Bryophytes and species of low informational value were excluded from further analysis. Species data from all three layers were merged with an exception of the class *Epilobietea angustifolii*, where distinction of layers is important. Numerical classification was done in the programs SYN-TAX2000 (PODANI 2001) and PC-ORD (MCCUNNE & MEFFORD 1999). Data were not transformed. According to the results of numerical analysis, smaller groups were created and subsequently analysed again. Various group linkage methods and distance measures were tried. β-flexible method (β= -0.25) in combination with Ruzicka coefficient proved to be the most effective and these parameters have been used in most of the analysis.

Phytocoenological tables were created in the program JUICE. Cover-abundance values 2a and 2b are used in the abbreviated form (a, b) in the tables. Relevés were merged into clusters (associations or communities) according to the results of numerical classification. Scarcely, relevés were moved inside the table, especially in cases of syntaxa with small number of

relevés. In few cases more clusters were merged. Frequency values together with median cover (upper index) of the certain taxon are listed in the column behind the syntaxa. Species are ordered into groups according to their syntaxonomical relations. Species found only in one or two relevés are listed below each table. Number in bracket indicates number of relevé and number or sign behind the bracket represents its cover value. Locality data are listed below the tables. Relevé numbers used in tables are the same as numbers used in the lists of localities. Nomenclature of taxa was used according to MARHOLD & HINDÁK (1998). Names of syntaxa follow JAROLÍMEK et al. (2008). Conservation status of endangered species was determined according to ČEŘOVSKÝ et al. (1999).

Results

Class *Bidentetea tripartitae* R. TX. et al. in R. TX. ex VON ROCHOV 1951
Order *Bidentetalia tripartitae* BR.-BL. et R. TX. ex KLIKA et HADAČ 1944
Alliance *Bidention tripartitae* NORDHAGEN 1940 em. R. TX. in POLI et J. TX. 1960
Association *Bidenti-Polygonetum hydropiperis* LOHMEYER in R. TX. 1950
Association *Catabroso-Polygonetum hydropiperis* POLI et J. TX. 1960
Association *Bidentetum radiatae* JAROLÍMEK et al. 1997
Alliance *Chenopodion glauci* HEJNÝ 1947
Echinochloa crus-galli community [*Chenopodion glauci*]
Association *Chenopodietum rubri* TIMÁR 1947

Class *Polygono arenastri-Poetea annuae* RIVAS-MARTÍNEZ 1975 corr. RIVAS-MARTÍNEZ et al. 1991
Order *Polygono arenastri-Poetalia annuae* R. TX. in GÉHU et al. 1972 corr. RIVAS-MARTÍNEZ et al. 1991
Alliance *Matricario matricarioidis-Polygonion arenastri* RIVAS-MARTÍNEZ 1975 corr. RIVAS-MARTÍNEZ et al. 1991
Association *Matricario-Polygonetum arenastri* T. MÜLLER in OBERD. 1971
Association *Poetum annuae* FELFÖLDY 1942

Class *Molinio-Arrhenatheretea* R. TX. 1937 em. R. TX. 1970
Order *Arrhenatheretalia* R. TX. 1931
Alliance *Cynosurion cristati* R. TX. 1947
Association *Lolietum perennis* GAMS 1927
Order *Plantagini-Prunelletalia* ELLMAUER et MUCINA 1993
Alliance *Plantagini-Prunellion* ELIÁŠ 1980
Association *Prunello-Ranunculetum repentis* WINTERHOFF 1963
Association *Juncetum tenuis* BRUN-HOOL 1962
Order *Potentillo-Polygonetalia* R. TX. 1947
Alliance *Potentillion anserinae* R. TX. 1947
Association *Potentilletum anserinae* RAPAICS 1927
Association *Rumici crispi-Agrostietum stoloniferae* MOOR 1958

Class *Stellarietea mediae* R. TX., LOHMAYER et PREISING in R. TX. ex VON ROCHOW 1951
Subclass *Sisymbrienea* POTT 1992
Order *Sisymbrietalia* J. TX. in LOHMEYER et al. 1962
Atriplex patula community [*Sisymbrietalia*]
Geranium pusillum community [*Sisymbrietalia*]
Tripleurospermum perforatum community [*Sisymbrietalia*]
Alliance *Sisymbrion officinalis* R. TX., LOHMEYER et PREISING in R. TX. 1950
Association *Erigeronto-Lactucetum serriolae* LOHMEYER in OBERD. 1957 em. MUCINA 1978
Alliance *Atriplicion nitentis* PASSARGE 1978
Association *Chenopodietum stricti* (OBERD. 1957) PASSARGE 1964
Alliance *Malvion neglectae* (GUTTE 1966) HEJNÝ 1978
Association *Hyoscyamo nigri-Malvetum neglectae* AICHINGER 1933

Class *Artemisietea vulgaris* LOHMEYER et al. in R. TX. ex VON ROCHOW 1951
Order *Onopordetalia acanthii* BR.-BL. et R. TX. ex KLIKA et HADAČ 1944
Alliance *Dauco-Melilotion* GÖRS 1966
Cirsium arvense community [*Dauco-Melilotion*]
Erigeron annuus community [*Dauco-Melilotion*]
Pastinaca sativa community [*Dauco-Melilotion*]
Association *Echio-Melilotetum* R. TX. 1947
Association *Tanaceto-Artemisietum vulgaris* SISSINGH 1950
Association *Poo compressae-Tussilaginetum* R. TX. 1931
Association *Artemisio vulgaris-Echinopetum sphaerocephali* ELIÁŠ 1978
Alliance *Arction lappae* R. TX. 1937
Association *Arctietum lappae* FELFÖLDY 1942
Order *Agropyretalia repentis* OBERD et al. 1967
Alliance *Convolvulo-Agropyrion repentis* GÖRS 1966
Association *Plantagini-Poetum compressae* JEHLÍK in HEJNÝ et al. 1979

Class *Bidentetea tripartitae* (Tab. 1)

Class *Bidentetea tripartitae* consists of synanthropic and seminatural nitrophilous communities of waterlogged habitats. It is characterised by the presence of species of genus *Bidens* (*B. frondosa*, *B. radiata*, *B. tripartita*), *Chenopodium* (*C. ficifolium*, *C. glaucum*, *C. rubrum*) and *Persicaria* (*P. dubia*, *P. hydropiper*, *P. lapathifolia*). It prefers periodically bared banks and bottoms of dams, ponds, small periodical streams and terrain depressions. It may be found even on extremely ammonia-rich habitats, such as dunghills and dung-holes.

Bidenti-Polygonetum hydropiperis (Tab. 1, column A)

The association in the Horná Orava region consists of stands, where one of the three species: *Bidens tripartita*, *Persicaria hydropiper* or *Persicaria lapathifolia* dominates, reflecting the ecological properties of the habitat. It is relatively abundant in the studied region, growing predominantly on the bared lakeshores of the Orava dam in low water levels, where it substitutes

communities of the class *Isoëto-Nanojuncetea,* as the area gets drier during summer. It can be found also on the banks of drain channels, not reinforced with concrete, especially in the region of Podbeskydská brázda trench. In comparison to the similar stands recorded in the southern parts of the Slovakia (JAROLÍMEK et al. 1997), it lacks few thermophilous species, such as *Cyperus fuscus*, *Lotus tenuis*, *Lythrum hyssopifolia* and *Setaria viridis*. When compared to the relevés from Liptovská kotlina region (HILBERT 1981), it misses species *Anthriscus sylvestris*, *Leonurus cardiaca* and *Poa palustris*. Communities from the Košická kotlina region (KRIPPELOVÁ 1981) contain also various thermophilous species, such as *Anthriscus cerefolium, Arctium lappa*, *A*. *minus*, *Inula britannica*, *Malva pusilla* and *Phellandrium aquaticum*, which were not recorded in the Horná Orava. It is noteworthy that alien species *Bidens frondosa*, introduced from the North America and commonly occurring in the southern Slovakia, is very rare in the studied area.

Catabroso-Polygonetum hydropiperis (Tab. 1, column B)

Rare stand of the association *Catabroso-Polygonetum hydropiperis* was recorded on the bank of Orava dam. In comparison to the relevés from Popradská and Ľubovnianska kotlina regions (ŠPÁNIKOVÁ & ZALIBEROVÁ 1982) *Alopecurus aequalis* is substituted by *A. geniculatus* and various hygrophilous species, such as *Epilobium roseum*, *Persicaria lapathifolia* and *Rorippa palustris* are missing. Community found in the Muránska planina plain (JAROLÍMEK et al. 2007) contains all the species recorded in the stand from Horná Orava region except for the species *Alopecurus geniculatus*, *Bidens tripartita*, *Eleocharis acicularis* and *Juncus bufonius*. The relevé from Orava is floristically similar to relevés from the north-eastern Slovakia (JAROLÍMEK & ZALIBEROVÁ 1995).

Bidentetum radiati (Tab. 1, column C)

The association was described for the first time from the bared bottom of the Orava dam (JAROLÍMEK et al. 1997). *Bidens radiata* is a dominant species; subdominantly are present *B. tripartita* and *B. cernua*. We presume that *Bidens radiata* has been brought in past by river from the Southern Poland, where it is quite common. The community was not recorded in any other part of the country and it was not recorded in the current survey as well. It is noteworthy though that even no individuals of the dominant species have been found during the recent study.

Echinochloa crus-galli community [*Chenopodion glauci*] (Tab. 1, column D)

The species-poor procoenosis consists of highly nitrophilous species of the alliance *Chenopodion glauci*, where species *Echinochloa crus-galli* dominates and *Chenopodium glaucum* is a subdominant. It was recorded on the older dunghill near the village Sedliacka Dubová. Species composition differs from the association *Echinochloo-Polygonetum*, recorded in the other parts of Slovakia (JAROLÍMEK et al. 1997).

Chenopodietum rubri (Tab. 1, column E)

The association *Chenopodietum rubri* comprises of stands of extremely nitrophilous and hygrophilous species, often of prostrate habitus. Dominant species, *Chenopodium glaucum*, is usually accompanied by other nitrophilous species of the family *Chenopodiaceae* (e.g. *Atriplex patula* and *Chenopodium album*). They can be found on extremely ammonia-rich habitats, e.g. dung holes and dunghills. The association is considered to be abundant but poorly documented in the Slovakia (JAROLÍMEK et al. 1997). Relevé from the Orava region lacks several thermophilous species, such as *Atriplex sagittata*, *A. tatarica*, *A. prostrata*, *Chenopodium rubrum*, *Echinochloa crus-galli*, *Persicaria lapathifolia* and *Rumex stenophyllus*, in comparison to records from the other parts of Slovakia.

Class *Polygono arenastri-Poetea annuae* (Tab. 2)

Communities of therophytes on trampled grounds represent the base of the class *Polygono arenastri-Poetea annuae*. This type of habitat is constantly mechanically disturbed by trampling, which not only damages vegetative and generative organs of plants but also changes mechanical properties of the soil. Only few stress-tolerant species are able to survive such conditions, therefore the communities are usually species-poor. They are dominated by therophytes *Matricaria discoidea*, *Poa annua* and *Polygonum arenastrum*, accompanied by stress-tolerant species of the class *Molinio-Arrhenatheretea*, such as *Plantago major*, *Lolium perenne* and *Taraxacum* sect. *Ruderalia*. This type of vegetation is very common on unpaved pathways, roads, parking places and playgrounds.

Matricario-Polygonetum arenastri (Tab. 2, column A)

Species-poor communities of reduced height are found on places frequently disturbed by trampling. The community consists of therophytes of the class *Polygono arenastri-Poetea annuae*, such as *Polygonum arenastrum* (dom.), *Matricaria discoidea* and *Poa annua* and *Molinio-Arrhenatheretea*, such as *Lolium perenne*, *Plantago major*, *Potentilla anserina*, *Taraxacum* sect. *Ruderalia* and *Trifolium repens*. Community prefers warm and dry habitats along roads and pavements, in yards, parking places, playgrounds, etc.

Association is quite abundant and documented by numerous relevés, mainly from the southern parts of Slovakia. It prefers warmer habitats even in the Horná Orava region. In comparison to the overall characteristics given in the Synopsis of Vegetation of Slovakia (JAROLÍMEK et al. 1997) and in the Košická kotlina region (KRIPPELOVÁ 1981), relevés from the Orava region lack more thermophilous species, such as *Atriplex tatarica* and *Lepidium ruderale*. Regions, located further to north, such as Muránska planina region (JAROLÍMEK et al. 2007,) and north-eastern Slovakia (JAROLÍMEK & ZALIBEROVÁ 1995) are very similar in species composition to the Orava region.

Poetum annuae (Tab. 2, columns B and C)

Grasslands of the association *Poetum annuae* are of reduced height as a result of intensive disturbance by trampling, too. They are poor in species and

have high proportion of therophytes, such as *Poa annua* (dom.), *Matricaria discoidea* and *Polygonum arenastrum* as well as other stress-tolerant species, such as *Lolium perenne*, *Plantago major*, *Potentilla anserina*, *Taraxacum* sect. *Ruderalia* and *Trifolium repens*. They prefer more humid habitats than stands of the previous association.

The association is subdivided into two subassociations: *Poetum annuae typicum* JAROLÍMEK et al. 1997 and *Poetum annuae matricarietosum discoideae* JAROLÍMEK et al. 1997. Stands belonging to the second subassociation are characterised by higher abundance of the species *Matricaria discoidea* and presence of differential taxa *Tripleurospermum perforatum* and *Urtica urens*. According to the results of numerical classification and occurrence of the differential taxa, stands of both subassociations are present in the Horná Orava region.

Stands belonging to the association *Poetum annuae* are abundant from lowlands to supramontane (JAROLÍMEK et al. 1997). They are quite frequent in the Horná Orava region as well. Few thermophilous species, namely *Anthemis cotula*, *Lepidium ruderale*, *Malva neglecta* and *M. pusilla*, are absent in the relevés from the Horná Orava region, but are present in the communities of warmer areas, published in the Synopsis of synanthropic vegetation of Slovakia (JAROLÍMEK et al. 1997) and Košická kotlina region (KRIPPELOVÁ 1981). Similarly to the previous association, stands from regions located further to the north, e.g. Muránska planina region (JAROLÍMEK et al. 2007) and north-eastern Slovakia (JAROLÍMEK & ZALIBEROVÁ 1995) have similar species composition to the community found in the Orava region.

Class *Molinio-Arrhenatheretea* (Tab. 3)

Syntaxonomical classification of trampled habitats was changing through decades and according to various authors. Formerly they were all classified in the class *Plantaginetea majoris*. Latterly, various authors incline to reclassification of the class and hemicryptophyte-dominated communities classify into the class *Molinio-Arrhenatheretea* (ELLMAUER & MUCINA 1993; JANIŠOVÁ et al. 2007; JAROLÍMEK et al. 2008).

Ruderal communities of the class *Molinio-Arrhenatheretea* grow on habitats affected by trampling as well, even though in general less intensive. They can be found on the edges of trampled habitats, dominated by the communities of the class *Polygono-Poetea*, in not frequently used unpaved forest roads, in terrain depressions, where the soil is compressed by the weight of periodical water, etc.

Lolietum perennis (Tab. 3, column A)

Stands of the association *Lolietum perennis* occupy trampled habitats. Two facies were distinguished, facies with *Lolium perenne* and facies with *Plantago major*. The abundance of both species depends on the intensity of trampling. *Plantago major* dominates on more intensively trampled habitats while *Lolium perenne* the opposite. The communities are species-poor, only few species can tolerate severe trampling, such as *Agrostis stolonifera*, *Capsella bursa-pastoris*, *Matricaria discoidea*, *Poa annua*, *Polygonum arenastrum*, *Taraxacum* sect.

Ruderalia and *Trifolium repens.* The community can be found on unpaved roads, parking lots, pathways and playgrounds. It is rather common in the studied region and well documented from various orographic units of the Horná Orava region. The communities are floristically very similar to those found in the other parts of the country.

Prunello-Ranunculetum repentis (Tab. 3, column B)

Hemicryptophyte grasslands are found on less intensively trampled habitats, most presumably old and moist unpaved forest roads, where *Prunella vulgaris* dominates and *Ranunculus repens* and *Plantago major* are subdominants. *Agrostis stolonifera*, *Alchemilla vulgaris* agg., *Bellis perennis*, *Lysimachia nemorum*, *Taraxacum* sect. *Ruderalia* and *Tussilago farfara* are constantly present. Moss layer with bryophytes *Atrichum undulatum*, *Caliergonella cuspidata*, *Dicranum scoparium*, *Lophocolea bidentata*, *Marchantia polymorpha*, *Pottia davaliana* or *Rhizomnium schreberi* is often developed.

The association is rather frequent in the Horná Orava region and it is floristically very similar to communities found elsewhere (JAROLÍMEK & ZALIBEROVÁ 1995; JANIŠOVÁ et al. 2007, JAROLÍMEK et al. 2007). It is noteworthy though that it very often contains species *Cardamine flexuosa*, which does not occur in relevés from the other parts of the country. *Carex viridula* (EN) has been found in one stand (Loc. 1).

Juncetum tenuis (Tab. 3, column C)

Juncus tenuis, dominant species of the association *Juncetum tenuis*, is a North-American neophyte that is rapidly spreading throughout the other parts of Slovakia. Only one locality of the association has been documented in the Horná Orava region on less intensively trampled unpaved forest road, close to the village Oravské Veselé, though other scattered localities of the species have been observed, too. *Agrostis stolonifera*, *Plantago major*, *Prunella vulgaris* and *Leontodon autumnalis* were present as well, though with smaller abundance.

The stands of the association prefer moist parts of unpaved forest roads or other trampled habitats on moist substrate (JAROLÍMEK & KLIMENT 2000). Even though there was only one locality recorded in the Horná Orava region, it does not floristically differ from the communities found in the other mountainous regions of Slovakia (JAROLÍMEK & KLIMENT 2000; JAROLÍMEK et al. 2007).

Potentilletum anserinae (Tab. 3, column D)

Stands of the association are usually species poor, only few other stress tolerant species, such as *Capsella bursa-pastoris*, *Lolium perenne*, *Matricaria discoidea*, *Poa annua*, *Polygonum arenastrum*, *Ranunculus repens* and *Trifolium repens* are present. They occur primarily on goose pastures, but they may be found even on other moist habitats, terrain depressions, banks, in the wet places, where timber is stored, and in the surrounding of human settlements (JAROLÍMEK & ZALIBEROVÁ 1995). Soils are clay, loam or loam-sands.

The community is rather common in the ruderal areas of the country. In the Horná Orava region it is documented by several older and recent relevés, which

do not markedly differ from the relevés made in the other regions of Slovakia (JAROLÍMEK & ZALIBEROVÁ 1995; JAROLÍMEK & KLIMENT 2000; JAROLÍMEK et al. 2007).

Rumici crispi-Agrostietum stoloniferae (Tab. 3, column E)

Except the dominant *Agrostis stolonifera*, and codominant *Rorippa sylvestris*; also *Alopecurus aequalis*, *A*. *geniculatus* and *Plantago major* are relatively abundant. The community is species-poor, one-layered and sparse. It is part of the mosaic of communities of bared banks of the Orava dam, where various communities of the classes *Bidentetea tripartitae*, *Isoëto-Nanojuncetea* and *Molinio-Arrhenatheretea* emerge depending on specific microclimate, soil and water regime. As the ecological conditions change, the communities evolve as well.

We do not suppose that the community is frequent in the region, because it prefers very specific ecological conditions and it has been found only during the recent research. Most probably it occurs only on the banks of Orava water dam. ŠPÁNIKOVÁ & ZALIBEROVÁ (1982) have found the community in Popradská and Ľubovnianska kotlina regions. Community from the Orava region is poorer in species and it lacks various species, namely *Epilobium roseum*, *Juncus articulatus*, *Lycopus europaeus*, *Persicaria hydropiper*, *Veronica beccabunga*, etc.

Class *Stellarietea mediae* (Tab. 4)

The ruderal vegetation of the class is classified into the subclass *Sisymbrienea*. The communities represent initial stages of succession on places naked from their plant cover or “new” substrates created by the transport of topsoil or other material, usually places connected to the building and construction processes. They comprise mainly of therophytes, such as *Atriplex patula*, *Capsella bursa-pastoris*, *Chenopodium album*, *C*. *strictum*, *Stellaria media* and *Tripleurospermum perforatum*, which are later on outcompeted by hemicryptophytes as the community evolves to the other stages of succession.

Atriplex patula community [*Sisymbrietalia*] (Tab. 4, column A)

Community with dominant *Atriplex patula* prefers newly bared soils, often rich in nitrogen. Other species belonging to the class *Stellarietea mediae*, such as *Chenopodium strictum*, *C*. *album*, *Sonchus oleraceus* and *Tripleurospermum perforatum* are present as well, though with smaller abundance. Presence of various species of the classes *Galio-Urticetea* and *Artemisietea vulgaris* implies further succession of the community.

According to JAROLÍMEK et al. (1997) this community is sparsely distributed in the country. It has been recorded in few orographic units; though, it is rarely mentioned in the literature. It is not very frequent in the Orava, but it is documented by several relevés and thus is not considered to be rare in the region. Floristically it resembles relevés made in the Ondavská vrchovina Mts (JAROLÍMEK & ZALIBEROVÁ 1995).

Geranium pusillum community [*Sisymbrietalia*] (Tab. 4, column B)

Community with *Geranium pusillum* can be found on warm, dry and sunny habitats, even affected by moderate trampling. Apart from the dominant species *Geranium pusillum*, various other species, tolerant to trampling, such as *Lolium perenne*, *Trifolium repens*, *Poa annua*, *Plantago major*, *Taraxacum* sect. *Ruderalia* and *Capsella bursa-pastoris* are present. In the Orava region it was usually found in the close proximity of railway stations (railway-side gravel) and along the roads and pavements, as these places offer suitable warm and dry conditions.

JAROLÍMEK et al. (1997) consider the community to be rarely found in the planar and colline zone of Slovakia. It is documented by three relevés from the Orava region, but it was found in more localities. Therefore, it is not considered to be rare, though not frequent, in the studied area. JAROLÍMEK et al. (2007) mentioned this community in the survey on the Muránska planina region and species composition of both communities is similar.

Tripleurospermum perforatum community [*Sisymbrietalia*] (Tab. 4, column C)

The community usually occupies newly abandoned or disturbed soils. It is probably the most frequent type of vegetation from subclass *Sisymbrienea* in the Horná Orava region. Apart from the dominant species *Tripleurospermum perforatum*, other characteristic species of the order *Sisymbrietalia* and class *Stellarietea mediae*, such as *Atriplex patula*, *Capsella bursa-pastoris*, *Chenopodium strictum*, *C. album*, *Galinsoga parviflora*, *Myosotis arvensis*, *Sonchus arvensis*, *S. oleraceus* and *Veronica persica*, are present. They are usually accompanied by species from classes *Galio-Urticetea* and *Artemisietea vulgaris*, such as *Artemisia vulgaris*, *Elytrigia repens* and *Rumex obtusifolius* that replace the community in succession.

The community prefers sunny, fresh or even mesic habitats. It can be found on new heaps of soil at construction sites, on uncultivated fields and other newly abandoned or disturbed lands. *Tripleurospermum perforatum* community is quite frequent throughout Slovakia, even though it is not yet well documented (JAROLÍMEK et al. 1997). JAROLÍMEK & ZALIBEROVÁ (1995) mentioned this type of community from Spišsko-Šarišské medzihorie region. It was recorded in many localities in the orographic units Oravská kotlina and Oravská vrchovina.

Erigeronto-Lactucetum serriolae (Tab. 4, column D)

The only one recorded stand near the Nižná nad Oravou village was species-poor, with *Lactuca serriola* and *Conyza canadensis* prevailing in the upper layer, *Sonchus arvensis* and *Cirsium arvense* in the poorly developed middle layer and shade-tolerant species *Agrostis stolonifera*, *Glechoma hederacea*, *Mentha arvensis* and *Taraxacum* sect. *Ruderalia* in the ground layer.

Recorded community, which is probably not common in the region, resembles stands found in the other parts of Slovakia (JAROLÍMEK et al. 1997; HILBERT 1981), though it is poorer in species (15 taxa in comparison to average of 21 and 23.3 taxa in the above-mentioned publications) and it lacks more

thermophilous species, such as *Atriplex tatarica*, *Carduus acanthoides*, *Chenopodium ficifolium*, *Descurainia sophia*, *Hordeum murinum*, *Lepidium ruderale* and *Malva neglecta*.

Chenopodietum stricti (Tab. 4, column E)

The appearance of the community is mainly determined by species *Chenopodium strictum* as dominant, *Atriplex patula* and *Tripleurospermum perforatum* as accompanying species and occasionally *C. album* as subdominant. Other constant species from the class *Stellarietea mediae*, such as *Capsella bursa-pastoris*, *Fallopia convolvulus*, *Stellaria media*, *Sonchus oleraceus* and *Veronica persica* are usually present, too. Presence of species of the classes *Artemisietea vulgaris* (*Artemisia vulgaris*, *Elytrigia repens*, *Medicago lupulina* and *Tussilago farfara*), *Galio-Urticetea* (*Aegopodium podagraria*, *Galium aparine*, *Rumex obtusifolius* and *Urtica dioica*) and *Molinio-Arrhenatheretea* (*Plantago major* and *Trifolium pratense*) indicates later successional trends.

Similarly to other communities of the class *Stellarietea mediae*, it is frequently found on newly disturbed land, earthworks, and piles of soil and other material in sunny, mesic to xeric places.

The association is very frequent and well documented throughout the country (JAROLÍMEK et al. 1997). In the Orava region, it was found in several localities in the orographic units Oravská kotlina and Oravská vrchovina. It resembles communities found in other parts of northern Slovakia (JAROLÍMEK & ZALIBEROVÁ 1995; JAROLÍMEK et al. 2007; JAROLÍMEK & KLIMENT 2000). In comparison to warmer lowland areas (JAROLÍMEK et al. 1997) it lacks few thermophilous species, such as *Atriplex tatarica*, *Carduus acanthoides*, *Chenopodium ficifolium*, *Hordeum murinum*, *Lepidium ruderale* and *Reseda lutea*. Moreover, hygrophilous species from the class *Galio-Urticetea* are more frequent.

Hyoscyamo nigri-Malvetum neglectae (Tab. 4, column F)

Rare stands of the association *Hyoscyamo-Malvetum* can be scarcely found around the whole country from planar to submontane zone. As its occurrence is connected with rural lifestyle, it is considered to be decreasing in number (JAROLÍMEK et al. 1997). There was found only one stand in the Orava region in the Horná Lehota village (Oravská vrchovina) on a small spot between pavement and fence, even though the region still has its old rural character. The soil was rich in nutrients and moderately moist. Prostrate and decumbent stems of the dominant species *Malva neglecta*, formed closed ground layer. Few other species: *Capsella bursa-pastoris*, *Chenopodium strictum*, *C. polyspermum*, *Galinsoga urticifolia*, *Geranium pusillum*, *Sisymbrium officinale*, *Sonchus oleraceus*, *Tripleurospermum perforatum* and *Veronica persica* were present, too. *Ceratodon purpureus* represents well developed moss layer with cover 45%. In comparison to Slovak lowlands (JAROLÍMEK et al. 1997, JAROLÍMEK & ZALIBEROVÁ 1995, JAROLÍMEK & KLIMENT 2000) thermophilous species *Anthemis cotula*, *Chenopodium murale*, *Hyoscyamus niger*, *Lepidium ruderale* and *Urtica urens* were absent.

Class *Artemisietea vulgaris* (Tab. 5)

Subxerothermophilous ruderal communities of tall biennial and perennial hemicryptophytes belong to the class *Artemisietea vulgaris*. The most characteristic species of the class are *Artemisia vulgaris*, *Carduus acanthoides*, *Cichorium intybus*, *Daucus carota*, *Elytrigia repens*, *Melilotus officinalis* and *Pastinaca sativa*. Constant presence of species of the class *Galio-Urticetea* in communities of the class *Artemisietea vulgaris* in the Horná Orava region indicates cold and humid character of the region.

Cirsium arvense community [*Dauco-Melilotion*] (Tab. 5, column A)

Medium-species-rich community is formed mainly by perennial herbs. It has usually just one distinct layer, because the dominant species, *Cirsium arvense*, creates dense upper layer, which blocks the establishment of ground layer. *Artemisia vulgaris*, *Elytrigia repens*, *Tanacetum vulgare* from the class *Artemisietea vulgaris* and *Dactylis glomerata*, *Lathyrus pratensis* and *Potentilla anserina* from the class *Molinio-Arrhenatheretea* are present with high constancy but small abundance. Species characteristic for the class *Galio-Urticetea*, such as *Aegopodium podagraria*, *Glechoma hederacea* and *Urtica dioica* are well represented, though with small abundance. Community demands similar environmental conditions as the association *Tanaceto-Artemisietum vulgaris*, usually typical ruderal sites, wet and nitrogen-rich disturbed habitats, but preferably older abandoned lands and places where nutrient-rich topsoil is accumulated after construction works. Community prefers sunny areas. It is optimally developed in summer (July - August), at the beginning with prevailing purple colour of *Cirsium* flowers and later on white from long pappi of its seeds.

Cirsium arvense community has been probably overlooked by syntaxonomists. It is rather widespread in the Orava region and well distinguishable from the other ruderal communities. It was recorded in many villages of the Oravská kotlina, Oravská vrchovina and Podbeskydská brázda orographic units. The community has affinity to the association *Tanaceto-Artemisietum vulgaris* within the alliance *Dauco-Melilotion*.

Stenactis annua community [*Dauco-Melilotion*] (Tab. 5, column B)

Stenactis annua is neophyte originating from the North America. It forms moderately species-rich two-layered communities. *Stenactis annua*, accompanied by *Artemisia vulgaris*, *Melilotus albus*, *Pastinaca sativa*, *Tanacetum vulgare* and another neophyte *Solidago canadensis*, dominated in the upper layer. In the lower layer were found *Achillea millefolium*, *Daucus carota*, *Odontites vulgaris*, *Plantago major*, *Poa pratensis* and *Trifolium pratense*. The community prefers sunny and warm habitats with well aerated soil.

Stenactis annua is rather rare in the Horná Orava region as we have recorded only one stand at the Oravský Podzámok railway station (Oravská vrchovina). The most probable explanation may be the relative isolation of the region, which is naturally only very slowly colonised by alien species. The fact

that the community was found in the railway station only supports this hypothesis. In addition to that, it is not planted as an ornamental in the area.

Pastinaca sativa community [*Dauco-Melilotion*] (Tab. 5, column C)

Two-layered community of grasses and forbs, dominated by *Pastica sativa*, started spreading rapidly just few years ago. Regarding species composition it has position somewhere on the boundary between classes *Artemisietea vulgaris* and *Molinio-Arrhentheretea*. Species of both classes are present, namely forbs *Pastinaca sativa*, *Artemisia vulgaris*, *Daucus carota*, *Medicago lupulina* and *Tanacetum vulgare* from the class *Artemisietea vulgaris* and *Achillea millefolium*, *Dactylis glomerata*, *Festuca pratensis*, *Poa pratensis* and *Potentilla anserina* from the class *Molinio-Arrhenatheretea*. In comparison to other communities of the class *Artemisietea vulgaris*, it almost completely lacks species of the class *Galio-Urticetea*, probably as a result of xerothermic character of habitats. Moss layer, represented by *Brachythecium starkei*, *Bryum argenteum* or *Plagiomnium rostratum* may occasionally develop.

It is found on sunny, warm and well drained slopes (5 to 35°) of the roads verges. Substrate is well aerated, loam to sand-loam, with proportion of slag used for spreading on roads in winter. It is optimally developed in summer (July and August), when the dominant species blooms with yellowish-green flowers.

JAROLÍMEK & ZALIBEROVÁ (2007) mention this type of community from the Muránska planina region and preliminarily classify it within the alliance *Dauco-Melilotion*. It is rather common in suitable stands in the Horná Orava region especially in lower altitudes of Oravská kotlina, Oravská vrchovina and Podbeskydská vrchovina orographic units. Floristically it resembles community from the Muránska planina region.

Echio-Melilotetum (Tab. 5, column D)

The association includes ruderal stands with dominant species *Melilotus albus* or *M. officinalis*. It usually has two or three well defined layers, upper layer formed by dominant species, middle layer composed of other species of the class *Artemisietea vulgaris* (*Artemisia vulgaris*, *Echium vulgare* and *Tanacetum vulgare*) and grasses (*Dactylis glomerata*, *Elytrigia repens* and *Festuca pratensis*). Ground layer consists of species of the class *Artemisietea vulgaris* and *Molinio-Arrhenatheretea*, e.g. *Achillea millefolium*, *Daucus carota*, *Lathyrus pratensis*, *Medicago lupulina*, *Odontites vulgaris*, *Ranunculus repens*, *Taraxacum* sect. *Ruderalia*, *Trifolium hybridum*, *T. pratense*, *Tussilago farfara* and *Vicia cracca*. Moss layer may occasionally occur, formed by species *Brachythecium rutabulum*, *Caliergonella cuspidata* and *Ceratodon purpureus*. On exceptionally warm and dry southerly oriented slopes, stands with dominant *Echium vulgare* may be found. They are rather rare, as the region has fairly cold and humid climate.

Stands of the association *Echio-Melilotetum* may be found on sunny and warm disturbed and abandoned stands, quarries and piles of various materials. The association is rather common and well documented from various parts of Slovakia (JAROLÍMEK et al. 1997). It is subdivided into two subassociations:

xerothermophilous *Echio-Melilotetum brometosum tectori* JAROLÍMEK et al. 1997 and mesophilous *Echio-Melilotetum tussilaginetosum farfarae* JAROLÍMEK et al. 1997. Community found in the Orava region is floristically and ecologically more related to the latter, as it lacks thermophilous species of the first subassociation. It is rather common in the region, especially in the Podbeskydská brázda, Oravská vrchovina and Oravská kotlina. Floristically it is very similar to relevés made in other parts of Slovakia: Drienčanský kras (JAROLÍMEK & KLIMENT 2000), Muránska planina (JAROLÍMEK et al. 2007) and north-eastern Slovakia (JAROLÍMEK & ZALIBEROVÁ 1995). Relevés from Liptovská kotlina (HILBERT 1981) contain other species of the order *Onopordetalia* (e.g. *Anchusa officinalis*, *Cirsium eriophorum*, *Reseda lutea* and *Verbascum phlomoides*), which were not present in the Orava.

Tanaceto-Artemisietum vulgaris (Tab. 5, column E)

Stands of this association are usually dominated by either *Artemisia vulgaris* or *Tanacetum vulgare*, while the other species usually works like subdominant, accompanied by *Cirsium arvense* and *Melilotus albus*. Ground layer may be developed as well with species *Armoracia rusticana*, *Astragalus glycyphyllos*, *Medicago lupulina* and rosettes of *Arctium* sp. Species of the class *Galio-Urticetea* (*Aegopodium podagraria*, *Chaerophyllum aromaticum*, *Galium aparine*, *Heracleum sphondylium*, *Rumex obtusifolius* and *Urtica dioica*) are very well represented.

They occur on ruderal sites around human settlements, on older abandoned lands, waste deposits etc. Substrate is clay-loam, loam or loam-sand, often with proportion of gravel or anthropogenous waste.

The association is abundant in the Slovakia (JAROLÍMEK et al. 1997) and Orava region is not an exception. Floristically the community resembles relevés from the other parts of Slovakia (JAROLÍMEK & ZALIBEROVÁ 1995; JAROLÍMEK et al. 1997; JAROLÍMEK et al. 2007), even though it lacks several thermophilous species (e.g. *Onopordum acanthium* and *Reseda lutea*) in comparison to the warmer parts of the country. On the other hand, species of the class *Galio-Urticetea* are much more represented, what indicates wetter and colder character of the region. From rare species, *Allium carinatum* (VU) was recorded in the community (Loc. 6).

Poo compressae-Tussilaginetum (Tab. 5, column F)

One-layer pioneer community is usually found on various bared grounds, near construction sites, on the piles of soil. Habitats are sunny with gentle or even steep slope, sometimes a bit moist. Substrate is clay loam, loam or sand-loam and contains gravel or even bigger stones. Except the dominant species *Tussilago farfara*, which in summer covers almost whole ground with its large leaves, other species of the class *Artemisietea vulgaris*, such as *Artemisia vulgaris*, *Cirsium arvense*, *Elytrigia repens*, *Medicago lupulina* and *Tanacetum vulgare*, are present, too. The community has two phenophases: spring phenophase, when *Tussilago farfara* blooms with yellow flowers and summer phenophase, when the community is dominated by its characteristic big leaves.

The communities of the association are probably quite widespread, though yet not very well documented (JAROLÍMEK et al. 1997). Relevés made in the Orava region floristically resemble those made in the other parts of Slovakia (JAROLÍMEK et al 1997), even though they lack few characteristic species of the class *Artemisietea vulgaris*, such as *Carduus acanthoides*, *Daucus carota* and *Silene *alba*. Species of *Galio-Urticetea* (*Aegopodium podagraria* and *Rumex obtusifolius*) are again more prominent.

Artemisio vulgaris-Echinopetum sphaerocephali (Tab. 5, column G)

It consists of species of the class *Artemisietea vulgaris*, with naturalised allochtonous species *Echinops sphaerocephalus* as a dominant species, accompanied with *Arctium tomentosum*, *Artemisia vulgaris* and *Elytrigia repens*. There was only one locality of the association recorded by JAROLÍMEK & ZALIBEROVÁ in the Horná Orava region in 1987 in the Vavrečka village. In literature it is documented from the Váh river basin, Trnavská pahorkatina region, Zemplínske vrchy Mts and Malé Karpaty Mts (JAROLÍMEK et al. 1997). The community probably does not find suitable conditions in the region, as thermophilous species *Arrhenatherum elatius*, *Carduus acanthoides*, *Convolvulus arvensis*, *Daucus carota* and *Dipsacus fullonum* are replaced by species of the class *Galio-Urticetea*: *Aegopodium podagraria*, *Chaerophyllum aromaticum*, *Cuscuta europaea*, *Rumex obtusifolius* and *Urtica dioica*. The community was not recently documented in the region.

Arctietum lappae (Tab. 5, column H)

The association consists of one-layer stands of perennials with dominating species of the genus *Arctium* (*A. tomentosum*, *A. minus* and *A. × ambiguum*). They are supplemented by species of the class *Artemisietea vulgaris* (*Armoracia rusticana*, *Artemisia vulgaris*, *Elytrigia repens*, *Silene *alba*, and *Tanacetum vulgare*) and *Galio-Urticea* (*Galium aparine*, *Heracleum sphondylium*, *Roegneria canina*, *Urtica dioica*). Ground layer is very poorly developed as a result of shading.

The community can be found on various ruderal sites, especially along roads. JAROLÍMEK et al. (1997) describe it as abundant in the warmer areas of southern and central Slovakia. In the studied region it was found in the Oravská kotlina orographic unit. Similarly to other communities from this region, it resembles relevés from the other parts of Slovakia, but lacked thermophilous differential species *Carduus acanthoides*. Constant species, *Ballota nigra*, according to JAROLÍMEK et al. (1997), was found only in one locality. Similarly to other communities found in the northern parts of Slovakia (JAROLÍMEK & ZALIBEROVÁ 1995), species of the class *Galio-Urticetea* are overly represented.

Plantagini-Poetum compressae (Tab. 5, column I)

Association consists of thermophilous grasses, dominated by *Poa compressa*. ZALIBEROVÁ & JAROLÍMEK found only one stand of the association in the Orava region in the Podbiel railway station (Oravská vrchovina) in 1987. *Conyza canadensis* was present as subdominant. Among other less abundant

species were found, e.g. *Elytrigia repens*, *Medicago lupulina*, *Sedum album* and *Taraxacum* sect. *Ruderalia*. Moss layer was very well developed, represented by species *Bryum argenteum*. The substrate was sand and gravel.

According to JAROLÍMEK et al. (1997) occurrence of the community is not well known and requires further study. In comparison to the other parts of Slovakia (JAROLÍMEK et al. 1997; JAROLÍMEK et al. 2007) the community found in the studied region was relatively species poor and it lacked thermophilous species *Hordeum murinum* and *Potentilla argentea*, and other species of the class *Artemisietea vulgaris*, such as *Artemisia vulgaris*, *Daucus carota*, *Melilotus officinalis* and *M. albus*. The community was not found during recent survey. It only proves the fact that the community is rather thermophilous and very rare.

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Tab. 1. Plant communities of the class *Bidentetea tripartitae* in the Horná Orava Region

A – *Bidenti-Polygonetum hydropiperis*
B – *Catabroso-Polygonetum hydropiperis*
C – *Bidentetum radiati*
D – *Echinochloa crus-galli* community
E – *Chenopodietum rubri*

Community	A		B	C		D	E
No. of relevé	232 23 332233222		1	1112 111111		2	
	121745678302251434869	%	6	78909401235	%	5	3
Bidens tripartita	**..b3b+1++..4444454453**	81^{4}	1	444433333bb	100^{3}	.	.
Persicaria lapathifolia	**+++44555544+.+.++.131**	86^{1}	.	aab1+1+a1+a	100^{1}	.	.
Persicaria hydropiper	**454..1+...b+b11ba....**	57^{a}	+	+1aa+.++aba	91^{1}	.	+
Agrostis stolonifera	**+.b.....aa++..+++**	43^{+}	.	.....	.	.	+
Catabrosa aquatica	.....	.	**3**	.....	.	.	.
Bidens radiata	.....++.....	10^{+}	+	**aabb3344333**	100^{3}	.	.
Phalaroides arundinacea	....++.+.....r..	19^{+}	.	**+1+1+++++11**	100^{+}	.	.
Glyceria fluitans	....+.a++..3.a...3...	33^{a}	3	**+1+.bba1+++**	91^{+}	.	.
Alopecurus geniculatus	....111+.....	19^{1}	+	**+1.a1+1aa1b**	91^{1}	.	.
Bidens cernua	....+.....	5^{+}	+	**+1.1ab11111**	91^{1}	.	.
Epilobium ciliatum	..+...+.+...+...+a...	29^{+}	.	**a.ra1a+a.11**	82^{1}	.	.
Alisma plantago-aquatica	...++.+.r.....	19^{+}	b	**+..ab111.r.**	64^{1}	.	.
Carex hirta	....+1+.+.....	19^{+}	.	**.++.+.++.++**	64^{+}	.	.
Epilobium hirsutum	.....r.....	5^{r}	.	**++++...++..**	55^{+}	.	.
Rumex maritimus	.....r1.	10^{r}	.	**r11++...+..**	55^{+}	.	.
Typha latifolia	...+.....	5^{+}	.	**+.r++.r....**	45^{+}	.	.
Juncus effusus	....+.....	5^{+}	.	**+.+b.+...+.**	45^{+}	.	.
Veronica anagallis-aquatica	.....r1.....	10^{r}	a	**+...+1+..+.**	45^{+}	.	.
Juncus conglomeratus	.....	.	.	**+...+.++...**	36^{+}	.	.
Potentilla norvegica	.....	.	.	**.....++++**	36^{+}	.	.
Echinochloa crus-galli	.....	.	.	.....	.	**5**	.
Chenopodium glaucum	...+.....a.....+	14^{+}	.	.....	.	b	**4**
***Bidentetea tripartitae*:**							
Persicaria maculosa	.....+....1...	10^{+}	.	.....	.	.	.
Bidens frondosa	.....+..	5^{+}	.	...+.....	9^{+}	.	.
Atriplex prostrata	.....	.	.	.....+..++	27^{+}	.	.
Chenopodium ficifolium	.....	.	.	.....+...	9^{+}	.	.
***Isoëto-Nanojuncetea*:**							
Juncus bufonius	..+.....+..1+.+...	24^{+}	+	...1.....	9^{1}	.	.
Rorippa sylvestris	...++.+...+.....131	33^{+}	.	.....	.	.	.
Filaginella uliginosa	...+.....1.....++a	24^{+}	.	.....	.	.	.
Limosella aquatica	.....1.....b+1	19^{1}	.	.....	.	.	.
Isolepis setacea	...b.....aa	14^{m}	.	.....	.	.	.
***Polygono arenastri-Poetea annuae*:**							
Poa annua	.+3.....+1.1..31.....	33^{1}	+	.....	.	.	1
Matricaria discoidea	++r.....+..a+.....	29^{+}	.	.....	.	.	a
Polygonum arenastrum	..+...+.....1...+....	19^{+}	.	.....	.	.	1
***Molinio-Arrhenatheretea*:**							
Ranunculus repens	.+1.1.1++..111+++a+.+	71^{+}	.	+++11.+.+1a	82^{+}	.	.
Plantago major	1.a4..++..1...++.+.ba	52^{1}	.	..1.++.+.+1	55^{+}	.	+
Agrostis gigantea	....+..+...+.....	14^{+}	.	...11.+1111	64^{1}	.	.
Trifolium repens	..+....+.....	10^{+}	.	.+1+.....++	45^{+}	+	+
Potentilla anserina	.+.r+.....1+.+1...	33^{+}	.	...+.....	9^{+}	.	.

Tab. 1. – cont.

Community	A		B	C		D	E
No. of relevé	232 23 332233222		1	1112 111111		2	
	121745678302251434869	%	6	78909401235	%	5	3
Scirpus sylvaticus	....+...r.....	10^{r}	.	..r+.1.....	27^{+}	.	.
Mentha longifolia	..r.....++....	14^{+}	.	.....	.	.	.
Juncus articulatus	........1.....	5^{1}	+	...b.....	9^{b}	.	.
Juncus inflexus	........+.....	5^{+}	+	...+.....	9^{+}	.	.
***Galio-Urticetea, Artemisietea vulgaris*:**							
Rumex obtusifolius	+a1.+.1++..+1+.111..+	67^{+}	.	.++++.1+++.	73^{+}	.	+
Urtica dioica	.++...++....+a.+++...	43^{+}	.	........r+1	27^{+}	.	.
Tussilago farfara	..1.++1....+1....+...	33^{+}	.	....+..+...	18^{+}	.	.
Tanacetum vulgare	..r...+.....1.	14^{+}	.	.r.....+.++	36^{+}	.	.
Poa trivialis	.1.....	5^{1}	.	........11.	18^{1}	.	.
Other taxa:							
Rorippa palustris	....3baa1...1++.+1...	48^{1}	.	ab31aa1b333	100^{b}	.	.
Tripleurospermum perforatum	...++.1++..rr.+....+.	43^{+}	.	1+11++++31b	100^{1}	+	.
Veronica beccabunga	1.b........a3b..1.r.+	38^{1}	a	+...ba1+.r.	55^{+}	.	.
Rumex crispus	....+..+r.....	14^{+}	.	.+r...++..+	45^{+}	.	.
Atriplex patula	.+.....+.+....	14^{+}	.	.+.....	9^{+}	.	a
Chenopodium album	.+.r.....+...+.	19^{+}	.	.....	.	.	1
Salix purpurea juv.	...1.....+.+	14^{+}	.	+.+.....	18^{+}	.	.
Lycopus europaeus	....+.....	5^{+}	.	.+.+.....r+	36^{+}	.	.
Agrostis capillaris	.....+.+.....	10^{+}	.	.....+1	18^{+}	.	.
Salix triandra juv.	......+.+.....	10^{+}	+	...+.....	9^{+}	.	.
Myosotis caespitosa	......+.....	5^{+}	.	+.....+.++.	36^{+}	.	.
Myosoton aquaticum	......+1.....+...	14^{+}	.	.....+.....	9^{+}	.	.
Galeopsis sp.	r+.....+.....	14^{+}	.	.....	.	.	.
Taraxacum sect. *Ruderalia*	..+.....+.1.....	14^{+}	.	.....	.	.	.
Equisetum arvense	...+.....+.+	14^{+}	.	.....	.	.	.
Salix aurita juv.	....+.....	5^{+}	.	...+...r...	18^{r}	.	.
Myosotis palustris agg.	.....+.....	5^{+}	1	...1.....	9^{1}	.	.
Sparganium erectum	.....	.	.	+...+.+....	27^{+}	.	.

Taxa in one or two relevés:

E_1: *Aegopodium podagraria* (34) +; *Alchemilla vulgaris* agg. (31) +, (35) +; *Arctium minus* (22) +, (24) +; *Armoracia rusticana* (32) 1, (34) a; *Atriplex sagittata* (25) 1; *Bromus *hordeaceus* (1) +; *Caltha palustris* (13) r; *Capsella bursa-pastoris* (31) +; *Carum carvi* (1) +, (31) +; *Chamerion angustifolium* (15) +, (25) +; *Chenopodium strictum* (7) 1; *Cirsium arvense* (13) r, (24) +; *Conyza canadensis* (23) +; *Crepis biennis* (2) r; *Dactylis glomerata* (33) +; *Daucus carota* (21) r, (22) +; *Digitaria sanguinalis* (23) a; *Eleocharis acicularis* (16) a, (20) b; *Elytrigia repens* (23) +, (32) +; *Epilobium montanum* (21) +; *E. parviflorum* (12) a, (13) a; *E. roseum* (2) 1, (35) a; *Epilobium sp.* (22) +; *Fallopia convolvulus* (33) r; *Festuca arundinacea* (3) +; *Galeopsis bifida* (33) +; *G. tetrahit* (24) 1; *Galinsoga urticifolia* (31) +, (32) 1; *Galium aparine* (22) +; *Glechoma hederacea* (22) +; *Heracleum sphondylium* (23) r, (31) +; *Juncus tenuis* (20) 1; *Lathyrus pratensis* (34) +; *Lolium multiflorum* (12) r; *L. perenne* (1) 1, (23) +; *Medicago lupulina* (8) r, (34) +; *Mentha × verticillata* (6) +; *Petasites hybridus* (33) +, (35) 1; *Phleum pratense* (2) +, (32) +; *Poa pratensis* (23) +; *Ranunculus acris* (31) +; *R. flammula* (20) +; *R. sceleratus* (8) 1; *Salix fragilis* juv. (17) +; *Silene *alba* (24) +; *Sinapis arvensis* (2) r; *Sonchus arvensis* (34) +; *S. oleraceus* (31) +, (32) +; *Sparganium emersum* (20) +; *Stellaria media* (2) +; *Stenactis annua* (12) +, (13) +; *Symphytum officinale* (6) +; *Trifolium hybridum* (5) +, (20) +; *Vicia cracca* (2) +.

E_0: *Brachythecium starkei* (31) a.

Localities of relevés:

Explanation: no. relevé in table (relevé numbers used in table are the same as numbers used in the list of localities), orographic unit, locality, habitat, soil, altitude (m), aspect (º), slope (º), relevé area (m^2), cover total (%), longitude (xxºxx'xx.xx″), latitude (xxºxx'xx.xx″), date (day.month.year), author of relevé (JM – Jana Medvecká, MZ – Marica Zaliberová, IJ – Ivan Jarolímek, TK – Terézia Krippelová). Abbreviation: v. – village, N – north, S – south, E – east, W – west, OP – Oravská priehrada-dam.

1. Podbeskydská brázda, v. Rabčice, yard of the house no. 43, near the woody stable, soil mixed with dung, wet from dung-water, 695 m, 0°, 0°, 9 m^2, 95%, 193042.33, 493012.70, 9. 7. 1986, MZ, TK & IJ.
2. Podbeskydská brázda, v. Sihelné, ditch along the road in front the house in slope, with back water on the bottom, loamy soil, 702 m, 0°, 0°, 7 m^2, 100%, 192536.12, 493014.11, 9. 7. 1986, MZ, TK & IJ.
3. Podbeskydská brázda, v. Rabčice, yard of the house no. 43, near the woody stable, close to the no. 1, 695 m, 45°, 5°, 9 m^2, 95%, 193042.37, 493012.74, 9. 7. 1986, MZ.
4. Oravská kotlina, OP, v. Osada, fringe stand on the elevated bank of dam, 603 m, 135°, 5°, 25 m^2, 95%, 193150.00, 492308.00, 4. 9. 1990, MZ.
5. Oravská kotlina, OP, v. Slanická osada, embankment, slope below the shipyard, sandy soil, 590 m, 90°, 5°, 25 m^2, 100%, 193056.98, 492419.36, 7. 9. 1990, MZ.
6. Oravská kotlina, OP, v. Slanická osada, N, near the Slanický ostrov-island with chapel, 595 m, 0°, 0°, 25 m^2, 100%, 193101.34, 492422.28, 6. 9. 1990, MZ.
7. Oravská kotlina, OP, v. Osada, near the embankment, E, sandy-loamy soil, 595 m, 315°, 15°, 25 m^2, 95%, 193050.00, 492345.00, 5. 9. 1990, IJ.
8. Oravská kotlina, OP, 200 m S from the island, gravely-sandy substratum on the bottom of the river, 590 m, 0°, 0°, 30 m^2, 90%, 193101.36, 492417.56, 6. 9. 1990, IJ.
9. Oravská kotlina, OP, below the hotel Goral, 595 m, 0°, 0°, 25 m^2, 100%, 193202.00, 492246.00, 4. 9. 1990, IJ, published in JAROLÍMEK et al. (1997).
10. Oravská kotlina, OP, 300 m N from the hotel Goral, sandy-clayey mud, 595 m, 0°, 0°, 25 m^2, 100%, 193155.00, 492305.00, 4. 9. 1990, IJ, published in JAROLÍMEK et al. (1997).
11. Oravská kotlina, OP, near the v. Slanická osada, E, 595 m, 90°,10°, 25 m^2, 100%, 193129.00, 492327.00, 4. 9. 1990, MZ, published in JAROLÍMEK et al. (1997).
12. Oravská kotlina, OP, Bobrovský záliv-gulf, E, 595 m, 0°, 0°, 30 m^2, 100%, 193212.00, 492523.00, 6. 9. 1990, IJ, published in JAROLÍMEK et al. (1997).
13. Oravská kotlina, OP, Bobrovský záliv-gulf, ca 300 m E from the previous relevé, 595 m, 0°, 0°, 30 m^2, 100%, 193204.00, 492517.00, 6. 9. 1990, IJ, published in JAROLÍMEK et al. (1997).
14. Oravská kotlina, OP, port near the hotel Goral, drier substratum, 595 m, 0°, 0°, 16 m^2, 100%, 193118.00, 492345.00, 4. 9. 1990, MZ, published in JAROLÍMEK et al. (1997).
15. Oravská kotlina, OP, Bobrovský záliv-gulf, 595 m, 0°, 0°, 25 m^2, 100%, 193159.00, 492529.00, 6. 9. 1990, MZ, published in JAROLÍMEK et al. (1997).
16. Oravská kotlina, OP, port near the hotel Goral, 595 m, 0°, 0°, 18 m^2, 100%, 193119.00, 492345.00, 4. 9. 1990, MZ & IJ.
17. Oravská kotlina, OP, hotel Goral, NW 1 km, sandy-clayey mud, 595m, 90°, 7°, 25 m^2, 100%, 193135.00, 492317.00, 4. 9. 1990, IJ, published in JAROLÍMEK et al. (1997).
18. Oravská kotlina, OP, v. Osada, elevated bank of the dam, 600 m, 270°, 5°, 30 m^2, 100%, 193159.00, 492255.00, 5. 9. 1990, IJ, published in JAROLÍMEK et al. (1997).
19. Oravská kotlina, OP, v. Osada, ca 1 km closer to the dam then the previous relevé, 595 m, 90°, 10°, 30 m^2, 100%, 193224.00, 492240.00, 5. 9. 1990, IJ, published in JAROLÍMEK et al. (1997).
20. Oravská kotlina, OP, Bobrovský záliv-gulf, flooded and wet peat bog, 595 m, 0°, 0°, 25 m^2, 100%, 193213.00, 492226.00, 6. 9. 1990, MZ, published in JAROLÍMEK et al. (1997).
21. Oravská kotlina, v. Lokca, in front of the house no. 335, ditch along the road, loamy soil with sand and gravel from the road, 730 m, 0°, 0°, 4.2 m^2, 80%, 192438.00, 492205.00, 25. 8. 1987, MZ.
22. Oravská vrchovina, v. Vaňovka, near the house no. 789, margin of the road, 720 m, 225°, 7°, 7 m^2, 95%, 192111.00, 492030.00, 26. 7. 1987, MZ.
23. Oravská vrchovina, v. Podbiel, railway station, among wooden cross ties on tracks, rocks with sand, 550 m, 0°, 0°, 2.80 m^2, 60%, 192843.60, 491825.56, 26. 8. 1987, MZ.

24. Oravská vrchovina, v. Chlebnice, ditch along the asphalt road, in front of the barn of the house no. 56, moist to wet loam, 605 m, 0°, 0°, 7 m ^{2}, 100%, 192752.00, 491349.00, 27. 8. 1987, MZ.
25. Oravská vrchovina, v. Sedliacka Dubová, older dunghill, 507 m, 0°, 0°, 50 m ^{2}, 90%, 192327.50, 491534.00, 2. 8. 2006, JM.
26. Oravská kotlina, OP, town Námestovo, bank towards v. Bobrov, bared bottom, loamy-clayey alluvium with decomposing plant remnants, 602 m, 0°, 0°, 20 m ^{2}, 95%, 192919.20, 492437.90, 6. 9. 2006, JM.
27. Oravská kotlina, OP, town Námestovo, near the opposite side of the bridge towards town Tvrdošín, bared bottom with sandy-loamy soil, 591 m, 0°, 0°, 16 m ^{2}, 85%, 192927.10, 492391.00, 11. 9. 2006, JM.
28. Oravská kotlina, OP, town Námestovo, near the opposite side of the bridge towards town Tvrdošín, near the influx of stream, bared bottom with loamy-clayey soil, 591 m, 0°, 0°, 16 m ^{2}, 75%, 192927.10, 492391.00, 11. 9. 2006, JM.
29. Oravská kotlina, OP, town Námestovo, near the opposite side of the bridge towards Tvrdošín, bared bottom of the stream, with loamy-clayey soil with decomposing plant remnants and house waste, 591 m, 0°, 0°, 10 m ^{2}, 65%, 192927.00, 492391.00, 11. 9. 2006, JM.
30. Oravská kotlina, OP, town Námestovo, bottom of dried basin, 50 m from the former shore-line, loamy-clayey soil, 600 m, 0°, 0°, 12 m ^{2}, 80%, 192870.60, 492412.90, 11. 9. 2006, JM.
31. Podbeskydská brázda, v. Oravská Polhora, bottom of the ditch near the house no. 846, loamy-clayey soil with large portion of gravel and slag from the road, 681 m, 0°, 0°, 7.5 m ^{2}, 90%, 192151.40, 491539.90, 27. 8. 2007, JM.
32. Podbeskydská brázda, Oravská Polhora, bottom of the ditch near the house no. 846, 690 m, 0°, 0°, 22.5 m ^{2}, 95%, 192537.30, 493219.70, 27. 8. 2007, JM.
33. Podbeskydská brázda, v. Oravská Polhora, bottom of the ditch near the house no. 835 with standing or slowly flowing water, 675 m, 0°, 0°, 22 .5 m^2, 95%, 192541.50, 493213.60, 27. 8. 2007, JM.
34. Podbeskydská brázda, v. Mútne, ditch near the house no. 141, loamy-clayey soil with gravel, 798 m, 0°, 0°, 15 m ^{2}, 95%, 191941.20, 492737.20, 29. 8. 2007, JM.
35. Podbeskydská brázda, v. Oravské Veselé, village ditch near the house no. 91 with 15 cm deep, standing or slowly flowing water, 682 m, 0°, 0°, 12 .00 m^2, 100%, 192305.40, 492716.40, 29. 8. 2007, JM.

Tab. 2. Plant communities of the class *Polygono arenastri-Poetea annuae* in the Horná Orava Region

A – *Matricario-Polygonetum arenastri*
B – *Poetum annuae typicum*
C – *Poetum annuae matricarietosum discoideae*

Community	A		B		C
No. of relevé			1 11		11
	23587	%	1943601	%	24
***Polygono-Poetea*:**					
Polygonum arenastrum	**34455**	100^4	.1.a.+.	43^1	.a
Medicago lupulina	**++..+**	60^+	.....	.	..
Poa annua	3+11b	100^1	**4444555**	100^4	aa
Matricaria discoidea	a+1r3	100^1	+1b3+++	100^+	**54**
***Molinio-Arrhenatheretea*:**					
Plantago major	aa11a	100^a	.3+1111	86^1	+b
Trifolium repens	1+++1	100^+	a11.1..	57^1	11
Taraxacum sect. *Ruderalia*	+++++	100^+	+.+.1+.	57^+	..
Potentilla anserina	+.+.+	60^+	+..1..+	43^+	1+
Lolium perenne	+.ab1	80^1	.a..a1.	43^a	.+
Ranunculus repens	+...+	40^+	..+.1..	29^+	..
Agrostis stolonifera	+....	20^+	.....+	14^+	..
Other taxa:					
Capsella bursa-pastoris	+r+..	60^+	..3...+	29^+	.+

Tab. 2. – cont.

Community	A		B		C
No. of relevé			1 11		11
	23587	%	1943601	%	24
Rumex obtusifolius	r....	20^{r}	..++++.	57^{+}	a.
Tripleurospermum perforatum	.r+.+	60^{+}	.....	.	++
Artemisia vulgaris	.+...	20^{+}	..+.r..	29^{r}	..
Chenopodium strictum	.rr..	40^{r}	..+....	14^{+}	..
Armoracia rusticana	..+r.	40^{r}	..+....	14^{+}	..

Taxa in one or two relevés:

E_1: *Aegopodium podagraria* (6) r; *Alchemilla vulgaris* agg. (2) +; *Arctium* sp. (5) r; *A. tomentosum* (13) r; *Atriplex patula* (3) r, (6) +; *Bellis perennis* (6) r, (11) +; *Cardamine* sp. (4) +; *Cichorium intybus* (14) r; *Chenopodium album* (3) r; *Equisetum arvense* (7) +; *Fallopia convolvulus* (5) r; *Festuca arundinacea* (9) a, (11) +; *Geranium* sp. (5) r; *Lamium purpureum* (4) +; *Rorippa palustris* (3) r; *Odontites vulgaris* (7) r; *Persicaria lapathifolia* (12) +; *Petasites hybridus* (5) 1; *Plantago lanceolata* (1) 3, (10) +; *Poa pratensis* (4) +; *Senecio vulgaris* (12) r; *Sisymbrium officinale* (3) +, (14) r; *Sonchus arvensis* (4) r; *Stellaria media* (4) +, (6) +; *Tanacetum vulgare* (7) r; *Trifolium pratense* (7) +; *Tussilago farfara* (5) +, (6) +; *Veronica arvensis* (4) +; *V. persica* (5) +; *Viola arvensis* (4) r;

E_0: *Bryum argenteum* (2) 1.

Localities of relevés: (explanation: see Tab. 1)

1. Podbeskydská brázda, v. Oravské Veselé, football stadium, trampled area on loamy-clayey soil, 710 m, 0°, 0°, 16 m ^{2}, 90%, 192309.00, 492725.00, 29. 7. 2006, JM.
2. Podbeskydská vrchovina, v. Breza, in front the house no. 141, trampled place on loamy-gravel soil with big stones, 666 m, 250°, 5°, 8 m ^{2}, 65%, 192258.10, 492326.90, 9. 8. 2006, JM & IJ.
3. Podbeskydská vrchovina, v. Zubrohlava, near the cinema, trampled margin of parking place, gravely-slag substratum with pieces of asphalt, 621 m, 177°, 3°, 4.5 m ^{2}, 75%, 193036.50, 492651.80, 10. 8. 2006, JM & IJ.
4. Oravská kotlina, v. Lokca, slightly trampled place near the house no. 163, loamy-clayey soil with 30% share of gravel, 625 m, 0°, 0°, 6 m ^{2}, 95%, 192431.40, 492211.10, 21. 5. 2007, JM.
5. Podbeskydská brázda, v. Sihelné, roadside near the house no. 201, trampled place with admixture of sand and gravel, 693m, 318°, 3°, 10.5 m^2, 85%, 192542.90, 493006.50, 12. 7. 2007, JM.
6. Podbeskydská vrchovina, v. Zákamenné, road towards the brook near Jednota-market, trampled place on loamy-clayey soil with gravel and small stones, 678 m, 3.5 m^2, 34°, 7°, 95%, 191818.60, 492311.60, 24. 8. 2007, JM.
7. Podbeskydská brázda, v. Oravská Polhora, road towards ski-lift, hardly trampled loamy-clayey soil, 683 m, 306°, 3°, 12 m ^{2}, 90%, 192620.50, 493124.20, 27. 8. 2007, JM.
8. Oravská vrchovina, town Tvrdošín, roadside between forestry school and settlement Staré Medvedzie, loamy-gravel soil with slag, 578 m, 58°, 7°, 6 m ^{2}, 95%, 193251.00, 491953.50, 19. 9. 2007, JM
9. Podbeskydská brázda, v. Rabčice, trampled part of yard in the house no. 53, 695 m, 45°, 5°, 25 m^2, 100%, 193059.33, 493018,82, 9. 7. 1986, MZ, TK & IJ.
10. Oravská kotlina, v. Lokca, trampled place near the house no. 332, 640 m, 0°, 0°, 9 m ^{2}, 100%, 192439.42, 492205.91, 5. 8. 1987, IJ.
11. Podbeskydská brázda, v. Oravská Polhora, 695 m, 0°, 0°, 16 m ^{2}, 100%, 192647.50, 493119.99, 9. 7. 1986, IJ.
12. Oravská kotlina, v. Vavrečka, W part of village, yard with hens, 640 m, 0°, 0 °, 9 m^2, 100%, 192750.22, 492313.9, 25. 8. 1987, IJ.
13. Oravská kotlina, v. Lokca, yard of the house no. 334, 645 m, 0°, 0°, 6 m ^{2}, 85%, 192438.19, 492206.24, 25. 8. 1987, IJ.
14. Oravská Vrchovina, v. Podbiel, trampled roadside near the house no. 63, 560 m, 0°, 0°, 5 m ^{2}, 70%, 192906.07, 491828.58, 10. 7. 1986, IJ & MZ.

Tab. 3. Plant communities of the class *Molinio-Arrhenatheretea* in the Horná Orava Region

A – *Lolietum perennis*
B – *Prunello-Ranunculetum repentis*
C – *Juncetum tenuis*
D – *Potentilletum anserinae*
E – *Rumici crispi-Agrostietum stoloniferae*

Community	A		B		C	D		E
No. of relevé	1111 521121111224442444		325 2333		2	33 233344434		2
	619029064315768277640859	%	129123301	%	4	374545568931270	%	88
Lolium perenne	**4444555531a++++bbb3+1b33**	100^{b}	+a....1..	33^{1}	.	+1a3b1.a+..+.3+	73^{1}	..
Plantago major	**11b+aa13133bbb4444443333**	100^{3}	bb++1ab+3	100^{a}	b	+3a1baaa1++111.	93^{1}	a3
Prunella vulgaris	.....++....	8^{+}	**333344444**	100^{4}	+	.....+++.1..+..	33^{+}	..
Ranunculus repens	....+.....+..+.....+..+.	21^{+}	**31+.111ba**	89^{1}	+	.+++++++a.+1++.	80^{+}	+.
Agrostis stolonifera	+..+.....+.1a.....a.1.1	33^{+}	**1.b3a+.3b**	78^{b}	b	....+.+b.1++a..	47^{+}	**4.**
Tussilago farfara	.....	.	**1.a.+111+**	78^{1}	.	+.....	7^{+}	..
Lysimachia nemorum	.....	.	**1.a.a.b1+**	67^{1}	.	.....	.	..
Epilobium montanum	.....	.	**r++...r+.**	56^{+}	.	.....	.	..
Juncus inflexus	.....	.	**+...+..++**	44^{+}	.	.....	.	..
Deschampsia cespitosa	.....	.	**..+.+..++**	44^{+}	.	.....	.	..
Juncus tenuis	.....	.	.....1...	11^{1}	**3**	.....	.	..
Potentilla anserina	.+1..+.+.++1++1+.++.++..	62^{+}	...1....r	22^{r}	.	**444444545555555**	100^{5}	+.
Tripleurospermum perforatum	..+.....+..+.....	12^{+}	.....	.	.	**+r++...+++.....**	47^{+}	..
Arctium tomentosum	.....	.	.....	.	.	**...r...r++...r+**	40^{r}	..
Rorippa sylvestris	.....	.	.....	.	.	.+.....	7^{+}	**3b**
Bidens tripartita	.....	.	.....	.	.	.....+....	7^{+}	**++**
***Molinio-Arrhenatheretea*:**								
Trifolium repens	b334411+a11a1+.3+baa333b	96^{a}	1+a+b+1.+	89^{+}	+	+11+b3a+.+.+++.	80^{+}	+.
Alchemilla vulgaris agg.	.....1...+.....++r+..	25^{+}	++.a.1++1	78^{+}	+	.....++.....	13^{+}	..
Carum carvi	.1..+.+.....1r.+..	25^{+}	..++..+..	33^{+}	+	.....+.....	7^{+}	..
Trifolium pratense	+.....+.+.r..+...+...+.	29^{+}	.....+...	11^{+}	.	.....+.....	7^{+}	..
Plantago lanceolata	+..+..+...+.....	17^{+}	.....1.+	22^{+}	.	....+a.....r...	20^{+}	..
Festuca pratensis	.....+...a.1	12^{1}	.....	.	.	.....1.1.....	13^{1}	..
Poa pratensis	.....+.....+.+	12^{+}	.....	.	.	.....+.....	7^{+}	..
Leucanthemum vulgare	.....	.	..r...r.r	33^{r}	.	.....	.	..
Cynosurus cristatus	.....	.	.....+...	11^{+}	+	.....	.	..
Lysimachia nummularia	.....	.	.....+...	11^{+}	.	.....	.	+.
Potentilla reptans	.....	.	.....+	11^{+}	.	.....1.....	7^{1}	..

Tab. 3. – cont.

Community	A		B		C	D		E
No. of relevé	1111 521121111224442444		325 2333		2	33 233344434		2
	619029064315768277640859	%	129123301	%	4	374545568931270	%	88
***Polygono arenastri-Poetea annuae*:**								
Poa annua	++111+1.1abb3+11aab3ba1a	96^{1}	+1.1..a.1	56^{1}	+	a1++33.a+1++.ab	87^{1}	..
Matricaria discoidea	+....+1.+a11+11.++.a+++1	71^{+}	.....	.	.	1+1a++r+1+.++11	93^{+}	..
Polygonum arenastrum	+....++a.a++.+3.+1...+..	50^{+}	...+.....	11^{+}	.	a.1++..+1..+++.	60^{+}	..
Other taxa:								
Taraxacum sect. *Ruderalia*	++1111++++a1+.++1++1.1b1	92^{+}	r.++.+.++	67^{+}	+	+1+11.....++...	47^{+}	..
Capsella bursa-pastoris	.....+...+.+.r+...+	25^{+}	.....	.	.	+r++++..+.++...	60^{+}	..
Bellis perennis	.....+..+.r...	12^{+}	.111..+.1	56^{1}	.	....11.....+..	20^{1}	..
Achillea millefolium	+.....+...+r...r...1+.r.	33^{+}	.....	.	.	.....1.+...+...	20^{+}	..
Rumex obtusifolius	.....+.....	4^{+}	.+.+.....	22^{+}	.	+.+.+.....1.+1+	47^{+}	..
Dactylis glomerata	+.++.+.....+.....++	29^{+}	..+.....	11^{+}	.	..+.....	7^{+}	..
Leontodon autumnalis	.....+.....+....+...+.	17^{+}	.....+.+	22^{+}	+	.+....1.....	13^{+}	..
Rumex crispus	.....+.....	4^{+}	...r.....	11^{r}	.	.....+.r.3.....	20^{r}	++
Artemisia vulgaris	+.....++..r.....	17^{+}	.....	.	.	...++...+.....	20^{+}	..
Medicago lupulina	+..+.....++.+.....	21^{+}	..+.....	11^{+}	.	.....	.	..
Daucus carota	.....+....r.....	8^{r}	.....	.	.	...+++.....	20^{+}	..
Melilotus albus	.....+.1r+.....	17^{+}	..r.....	11^{r}	.	.....	.	..
Picea abies	.....	.	....r+.++	44^{+}	r	.....	.	..
Mentha arvensis	.....	.	.....a...	11^{a}	.	3....++.....	20^{+}	1.
Myosotis scorpioides	.....	.	+...1+...	33^{+}	.	.....	.	r.
Stellaria media	.....+.....+	8^{+}	.....	.	.	+...+.....	13^{+}	..
Persicaria hydropiper	.....	.	...+.....	11^{+}	.	.....1+...+	20^{+}	..
Urtica dioica	.....	.	.....	.	.	....+....+1..1.	27^{+}	..
Arctium sp.	.r+.....+.....	12^{+}	.....	.	.	.....	.	..
Armoracia rusticana	...+...1.....	8^{+}	.....	.	.	...+.....	7^{+}	..
Juncus bufonius	....+....+.....	8^{+}	....1....	11^{1}	.	.....	.	..
Bryum argenteum	.....1.....1...b....	12^{1}	.....	.	.	.....	.	..
Chenopodium strictum	.....r..r..r.....	12^{r}	.....	.	.	.....	.	..
Tanacetum vulgare	.....+.....+	8^{+}	.....r	11^{r}	.	.....	.	..
Odontites vulgaris	.....+.....+.	8^{+}	.....	.	.	.....+.....	7^{+}	..
Equisetum arvense	.....+.....	4^{+}	+.....	11^{+}	.	.....+.....	7^{+}	..
Elytrigia repens	.....+....+.	8^{+}	.....	.	.	+.....	7^{+}	..

Tab. 3. – cont.

Community No. of relevé	A 1111 521121111224442444 619029064315768277640859	%	B 325 2333 129123301	%	C	D 33 233344434 374545568931270	%	E 2 88
Chenopodium bonus-henricus	.....+.	4^{+}	.....	.	.	..a.....+....	13^{+}	..
Epilobium ciliatum	.....	.	r...+...+	33^{+}	.	.....	.	..
Cerastium holosteoides	.....	.	+....+...	22^{+}	r	.....	.	..
Carex hirta	.....	.	r.....+	22^{r}	.	.....1.....	7^{1}	..
Cirsium arvense	.....	.	rr.....	22^{r}	.	.....+...	7^{+}	..
Juncus articulatus	.....	.	1...a....	22^{1}	.	.....	.	1.
Hypericum maculatum	.....	.	.r...+.+.	33^{+}	.	.....	.	..
Carex sylvatica	.....	.	..+..1..+	33^{+}	.	.....	.	..
Festuca arundinacea	.....	.	...+.....	11^{+}	.	.....++..	13^{+}	..
Senecio vulgaris	.....	.	.....+	11^{+}	.	...+.....+....	13^{+}	..
Persicaria lapathifolia	.....	.	.....	.	.	r.....+.+....	20^{+}	..

Taxa in one or two relevés:

E_1: *Abies alba* juv. (33) r; *Acetosella vulgaris* (35) r; *Aegopodium podagraria* (32) +; *Agrostis capillaris* (23) +, (24) +; *Alisma plantago-aquatica* (28) +; *Alopecurus aequalis* (28) 1; *A. geniculatus* (8) a; *A. pratensis* (47) +; *Anagallis arvensis* (46) +; *Angelica sylvestris* (29) +, (32) +; *Arctium lappa* (34) +; *A. minus* (4) +; *Astrantia major* (23) r; *Athyrium filix-femina* (30) +; *Atriplex patula* (41) r; *Bidens frondosa* (8) +; *Calamagrostis arundinacea* (23) +; *Caltha palustris* (42) +; *Carex tumidicarpa* (2) +; *C. ovalis* (2) +; *C. remota* (1) r; *C. viridula* (1) +; *Cardamine flexuosa* (32) 1, (33) +; *Cerastium glutinosum* (21) +; *Chaerophyllum aromaticum* (34) 1, (43) r; *C. hirsutum* (2) r, (23) +; *Cirsium arvense* (1) r, (33) +; *Corylus avellana* juv. (33) r; *Epilobium tetragonum* (21) r; *Equisetum sylvaticum* (2) r, (30) +; *Festuca rubra* agg. (7) +; *Filipendula ulmaria* (23) r; *Fragaria vesca* (29) 1, (32) +; *Galeopsis* sp. (30) 1; *G. speciosa* (30) r; *G. tetrahit* (31) +, (41) +; *Galinsoga parviflora* (43) r; *Galium schultesii* (23) +, (29) +; *Geranium pratense* (36) +; *G. pusillum* (6) +, (9) +; *Geranium* sp. (5) +, (29) r; *Geum rivale* (23) +; *G. urbanum* (39) 1; *Glechoma hederacea* (34) +, (51) +; *Glyceria fluitans* (23) +, (31) +; *Heracleum sphondylium* (5) r; *Hypericum perforatum* (29) r; *Imaptiens noli-tangere* (2) +, (30) 1; *Isolepis setacea* (8) a; *Juncus compressus* (16) r; *Lapsana communis* (29) r; *Lotus corniculatus* (25) +; *Luzula luzuloides* (29) +, (33) +; *Lycopus europaeus* (8) +; *Matricaria recutita* (5) b, (51) +; *Medicago falcata* (6) +; *Mycelis muralis* (32) +; *Myosotis sylvatica* (51) +; *Persicaria maculosa* (42) +, (51) +; *Petasites hybridus* (21) +, (32) a; *Phalaroides arundinacea* (8) +; *Phleum pratense* (12) +, (49) +; *Poa compressa* (38) +; *P. trivialis* (35) +; *Ranunculus acris* (49) r; *R. flammula* (2) r, (25) +; *Sagina procumbens* (44) +; *Salix fragilis* juv. (8) +; *S. purpurea* juv. (28) 1; *Senecio jacobea* (42) +, (51) 1; *Sisymbrium officinale* (44) +; *Sonchus oleraceus* (3) r, (21) +; *Stachys sylvatica* (23) +; *Stellaria alsine* (2) +; *Trifolium hybridum* (29) +; *Trisetum flavescens* (21) 1; *Urtica urens* (3) +; *Veronica anagallis-aquatica* (28) +; *V. beccabunga* (42) +; *V. chamaedrys* (4) +; *V. persica* (12) +; *Veronica* sp. (5) +; *Vicia cracca* (16) +; *Vicia* sp. (3) r.

Tab. 3. – cont.

E_0: *Atrichum undulatum* (30) +, (33) +; *Bryum rubens* (30) +; *Ceratodon purpureus* (14) +; *Calliergonella cuspidata* (29) 1; *Dicranum scoparium* (23) +; *Eurhynchium angustirete* (23) b; *Hypnum lindbergii* (23) +; *Lophocolea bidentata* (23) b; *Pellia endiviifolia* (29) 1; *Pellia* sp. (23) 1, (30) 1; *Marchantia polymorpha* (23) 1; *Pleurozium schreberi* (33) 1; *Pottia davalliana* (32) 1; *Rhizomnium punctatum* (33) +.

Localities of relevés: (explanation: see Tab. 1)

1. Oravské Beskydy, elevation point Vysoká (996,4), NW 1km, unpaved forest road through a clearing, loamy-clayey soil, rocky (shale), 824 m, 5°, 7°, 6 m^2, 75%, 192627.80, 493303.80, 8. 8. 2007, IJ.
2. Oravské Beskydy, elevation point Poľany (880,9), northerly, clearing SWW from the Vydrovka cottage, in the middle of the unpaved forest road, loamy rocky soil, 774 m, 352°, 7°, 5 m^2, 80%, 192411.70, 493325.30, 9. 8. 2007, IJ.
3. Oravská kotlina, v. Hruštín, neglected front garden in front of a new building no. 248, loam with lime admixture, 697 m, 0°, 0°, 7.5 m^2, 90%, 192003.00, 491915.00, 26. 8. 1987, MZ & IJ.
4. Oravská vrchovina, v. Podbiel, abandoned land opposite to wooden cottage no. 99, loam with sparse rocks, 555 m, 0°, 0°, 21 m^2, 95%, 192905.00, 491819.00, 26. 8. 1987, MZ & IJ.
5. Oravská vrchovina, v. Krivá, area between road and front garden of house no. 82, loamy-sandy substrate, 545 m, 0°, 0°, 7.5 m^2, 100%, 192835.00, 491702.00, 26. 8. 1987, MZ & IJ.
6. Podbeskydská vrchovina, v. Zubrohlava, by the football stadium, trampled site, river terrace with small stones of various sizes, 615 m, 0°, 0°, 14 m^2, 80%, 193030.30, 492655.10, 10. 8. 2006, JM & IJ.
7. Oravská kotlina, town Námestovo, embankment between two polders, close to the outfall of Biela Orava river, loamy site with big stones on the surface, 606 m, 3°, 7°, 3 m^2, 85%, 192849.30, 492405.10, 11. 8. 2006, JM & IJ.
8. Oravská kotlina, town Námestovo, embankment between two polders, close to the outfall of Biela Orava river, gravely-loamy, 606 m, 130°, 5°, 15 m^2, 90%, 192849.70, 492404.20, 11. 8. 2006, JM & IJ.
9. Oravská vrchovina, v. Podbiel, back road on SE periphery of the village, trampled site, clayey-loamy-rocky, 561 m, 49°, 3°, 10 m^2, 80%, 192918.00, 491841.00, 17. 8. 2006, JM.
10. Oravská vrchovina, v. Nižná, below the Nižná sport centre, road to river bank, trampled site, loamy-sandy, 558 m, 157°, 5°, 12.5 m^2, 95%, 193151.90, 491825.70, 17. 6. 2007, JM.
11. Oravská vrchovina, v. Nižná, trampled site below Malá Orava bus stop, clayey-sandy, 578 m, 0°, 0°, 12 m^2, 85%, 193048.70, 491837.10, 17. 6. 2007, JM.
12. Oravská vrchovina, v. Podbiel, digression to river embankment, trampled site on the way to Nižná, loamy-clayey, 573 m, 242°, 3°, 12 m^2, 100%, 192948.80, 491834.50, 17. 6. 2007, JM.
13. Oravská vrchovina, v. Podbiel, like 12., 572 m, 143°, 3°, 12 m^2, 55%, 192948.60, 491834.10, 17. 6. 2007, JM.
14. Podbeskydská brázda, v. Rabčice, in front of the house no. 267, close to the Rabčice cross-road, bus stop, trampled site, bitumen, gravel and shallow soil, 741 m, 147°, 5°, 12.5 m^2, 65%, 193128.00, 493027.40, 9. 7. 2007, JM.
15. Podbeskydská brázda, v. Sihelné, by the Jednota bus stop, edge of a road, drainage channel in the middle, trampled site, gravely, 766 m, 160°, 5°, 15 m^2, 50%, 192414.50, 493053.60, 12. 7. 2007, JM.

Tab. 3. – cont.

16. Podbeskydská brázda, v. Rabčice, parking place by the kindergarten, clayey-gravely trampled site, 697 m, 267°, 3°, 30 m ^{2}, 30%, 193100.40, 493019.10, 16. 7. 2007, JM.
17. Podbeskydská brázda, v. Rabča, parking lot below the cross-road Sihelné, bus stop, trampled site, gravely-sandy-clayey, 662 m, 20°, 3°, 50 m^2, 55%, 192757.30, 492952.30, 16. 7. 2007, JM.
18. Podbeskydská brázda, v. Rabča, trampled site opposite to the house no. 929, gravely-loamy, 624 m, 0°, 0°, 15 m ^{2}, 90%, 192724.20, 492936.60, 16. 7. 2007, JM.
19. Podbeskydská brázda, v. Rabča, football stadium, trampled site app. 10 m from the goal, loamy-clayey, 650 m, 0°, 0°, 25 m ^{2}, 100%, 192735.00, 492947.30, 16. 7. 2007, JM.
20. Podbeskydská brázda, v. Rabča, football stadium, trampled site app. 1.5 m from the goal, loamy-clayey, 650 m, 0°, 0°, 10 m ^{2}, 75%, 192735.30, 492947.20, 16. 7. 2007, JM.
21. Oravská kotlina, v. Hruštín, parking place in front of the fire station, trampled site, clayey-sandy-gravely, 689 m, 297°, 3°, 15 m ^{2}, 70%, 192050.60, 491930.50, 26. 7. 2007, JM.
22. Oravská kotlina, v. Babín, between big and small football stadium, trampled site, loamy, 657 m, 112°, 2°, 25 m ^{2}, 95%, 192229.00, 492011.90, 26. 7. 2007, JM.
23. Podbeskydská brázda, v. Oravské Veselé, the centre of unpaved forest road, rocky-loamy substrate, 724 m, 2°, 5°, 3 m ^{2}, 97%, 192328.30, 492633.40, 7. 8. 2007, JM & IJ.
24. Podbeskydská brázda, v. Oravské Veselé, forest road southerly from the village, 1st from the right behind the bridge, unpaved forest road, gravely-loamy, 725 m, 98°, 3°, 5 m ^{2}, 75%, 192312.40, 492633.60, 7. 8. 2007, JM & IJ.
25. Podbeskydská brázda, v. Oravská Polhora, timber storage place close to the Hliny border-crossing, gravely-clayey, 783 m, 76°, 10°, 6 m ^{2}, 85%, 192247.00, 493234.00, 10. 8. 2007, JM & IJ.
26. Oravská kotlina, v. Vasiľov, back road on S periphery of the village, trampled site, clayey-loamy, 651 m, 22°, 3°, 15 m ^{2}, 100%, 192308.50, 492046.50, 28. 8. 2007, JM.
27. Oravská kotlina, v. Vasiľov, road to meadows above the village, trampled site, sandy-loamy, 621 m, 6°, 5°, 15 m ^{2}, 95%, 192315.80, 492045.00, 28. 8. 2007, JM.
28. Oravská kotlina, town Námestovo, bottom of drying polder, below the bus station, logged, big stones up to 5% of cover, 600 m, 178°, 3°, 24 m^2, 95%, 192852.90, 492409.70, 31. 8. 2007, JM.
29. Oravská Magura, v. Zemianska Dedina, occasionally used forest road above horse barn, slightly trampled site, 784 m, 145°, 20°, 6 m ^{2}, 85%, 192858.50, 492031.50, 16. 9. 2007, JM.
30. Oravská Magura, v. Zemianska Dedina, below the elevation point Kýčera (953,2), occasionally used forest road, trampled site, 929 m, 53°, 10°, 6 m ^{2}, 85%, 192829.90, 492100.20, 16. 9. 2007, JM.
31. Oravská Magura, v. Zemianska Dedina, elevation point Kýčera (953,2), unpaved forest road to Mt. Budín (1221,4), trampled site, brown forest soil, 958 m, 139°, 15°, 6 m ^{2}, 80%, 192830.90, 492041.20, 16. 9. 2007, JM.
32. Oravská kotlina, town Tvrdošín, Bučník, rarely used forest road, trampled site, brown forest soil, 769 m, 271°, 5°, 5 m ^{2}, 75%, 193127.00, 492045.00, 19. 9. 2007, JM.
33. Oravská kotlina, town Tvrdošín, Bučník, rarely used forest road, approx. 40 m NW from the previous relevé, trampled site, brown forest soil, 774 m, 110°, 5°, 6 m ^{2}, 90%, 193126.20, 492046.10, 19. 9. 2007, JM.

Tab. 3. – cont.

34. Oravská vrchovina, v. Podbiel, in front of the house no. 63, yard with gooses, 575 m, 0°, 0°, 4 m ^{2}, 100%, 10. 7. 1986, IJ.
35. Oravská kotlina, v. Vavrečka, trampled place in front of the firehouse, loamy soil, 650 m, 0°, 0°, 6 m ^{2}, 100%, 192808.06, 492309.49, 25. 9. 1987, IJ & MZ.
36. Oravská vrchovina, v. Revišné, in front of the house no. 273, goose lawn between road and brook, 505 m, 0°, 0°, 10 m ^{2}, 95%, 191430.04, 491307.17, 8. 7. 1986, IJ.
37. Oravská kotlina, v. Vavrečka, near the house no. 221, trampled site between road and fence, 650 m, 0°, 0°, 8 m ^{2}, 95%, 192846.10, 492305.10, 25. 8. 1987, IJ.
38. Oravská kotlina, v. Oravská Jasenica, near the house no. 262, road verge, 620 m, 180°, 30°, 8 m ^{2}, 100%, 192612.19, 492317.84, 9. 7. 1986, IJ.
39. Oravská vrchovina, v. Zábrež, near the house no. 106, shallow ditch along garden fence, 480 m, 0°, 0°, 8 m ^{2}, 95%, 191507.03, 491152.47, 11. 7. 1986, IJ.
40. Oravská kotlina, v. Lokca, yard of the house no. 332, goose lawn, trampled clayey-loamy soil, 650 m, 0°, 0°, 20 m ^{2}, 95%, 192453.14, 492158.89, 25. 8. 1987, IJ.
41. Podbeskydská brázda, v. Rabčice, edge of road near the house no. 178, 690 m, 0°, 0°, 6 m ^{2}, 95%, 193054.54, 493017.31, 9. 7. 1986, IJ & MZ.
42. Podbeskydská brázda, v. Oravská Polhora, yard of the house no. 457, goose lawn, trampled, 695 m, 0°, 0°, 6 m ^{2}, 95%, 192655.06, 493113.87, 9. 7. 1986, IJ.
43. Oravská kotlina, v. Suchá Hora, near the garden of the house no. 162, slope of shallow ditch, 795 m, 180°, 10°, 4 m ^{2}, 100%, 194703.20, 492158.17, 10. 7. 1986, IJ & MZ.
44. Oravská vrchovina, v. Revišné, yard of the house no. 273, road to garage, 510 m, 270°, 2°, 8.4 m ^{2}, 90%, 191422.20, 491316.85, 8. 7. 1986, MZ, IJ & TK.
45. Oravská kotlina, v. Hruštín, opposite to the house no. 454, next to the shopping centre, gravely substrate, 695 m, 180°, 5°, 12 m ^{2}, 85%, 192044.59, 491924.56, 26. 8. 1987, MZ.
46. Oravská vrchovina, v. Oravský Podzámok, trampled place near the electric power station, 540 m, 180°, 5°, 12 m ^{2}, 95%, 192149.00, 491545.00, 26. 8. 1987, IJ.
48. Oravská vrchovina, v. Oravská Poruba, yard of the house no. 104, 495 m, 0°, 0°, 12 m ^{2}, 90%, 191607.00, 491140.00, 11. 7. 1986, IJ & MZ.
49. Oravská kotlina, v. Suchá Hora, middle of the field road near an abandoned railway station, slightly trampled, loamy-sandy soil, 795 m, 0°, 0°, 6 m ^{2}, 100%, 194722.00, 492214.00, 10. 7. 1986, IJ.
50. Oravská kotlina, v. Vavrečka, W periphery of the village, sporadically used unpaved road between gardens, 642 m, 0°, 5°, 20 m ^{2}, 90%, 192747.00, 492309.00, 25. 8. 1987, IJ.
51. Podbeskydská brázda, v. Oravská Polhora, trampled yard of the house no. 457, 690 m, 0°, 0°, 4 m ^{2}, 100%, 192701.00, 493111.00, 9. 7. 1986, IJ.

Tab. 4. Plant communities of the class *Stellarietea mediae* in the Horná Orava Region

A – *Atriplex patula* community
B – *Geranium pusillum* community
C – *Tripleurospermum perforatum* community
D – *Erigeronto-Lactucetum serriolae*
E – *Chenopodietum stricti*
F – *Hyoscyamo nigri-Malvetum neglectae*

Community	A		B	C		D	E		F
No. of relevé	11		11	11		1	1 1		1
	4635	%	917	13075	%	9	28274	%	6
Atriplex patula	**5555**	100^{5}	.+.	1	20^{1}	.	..a.3	40^{a}	.
Geranium pusillum	....	.	**335**	.....	.	.	...+.	20^{+}	3
Tripleurospermum perforatum	1.a1	75^{1}	...	**34444**	100^{4}	+	++1.b	80^{+}	+
Myosotis arvensis	....	.	...	**3.1r.**	60^{1}	.	.....	.	.
Apera spica-venti	....	.	...	**..+.+**	40^{+}	.	.....	.	.
Sonchus asper	....	.	...	**...+r**	40^{r}	.	.....	.	.
Lactuca serriola	....	.	...	.....	.	**5**	.....	.	.
Conyza canadensis	....	.	...	.....	.	**3**	.....	.	.
Chenopodium strictum	r.a1	75^{1}	+.+	.1+3+	80^{+}	.	**33344**	100^{3}	+
Aegopodium podagraria	....	.	.1.	..1..	20^{1}	.	**+.b++**	80^{+}	.
Galium aparine	..1.	25^{1}	...	....+	20^{+}	.	**+.++a**	80^{+}	.
Sinapis arvensis	....	.	...	+....	20^{+}	.	**+.+.+**	60^{+}	.
Tussilago farfara	..+.	25^{+}	...	.....	.	.	**1.+.1**	60^{1}	.
Melilotus albus	..+.	25^{+}	...	.....	.	.	**..++1**	60^{+}	.
Malva neglecta	....	.	...	.....	.	.	.....	.	**4**
***Sisymbrietalia, Sisymbrienea, Stellarietea mediae*:**									
Capsella bursa-pastoris	....	.	++b	..11+	60^{1}	.	..1++	60^{+}	+
Fallopia convolvulus	3.+a	75^{a}	...	+...+	40^{+}	.	..+++	60^{+}	.
Sonchus oleraceus	r1r.	75^{r}	...	...+.	20^{+}	.	+..+.	40^{+}	1
Veronica persica	....	.	r..	+.+1.	60^{+}	.	+.+..	40^{+}	1
Equisetum arvense	.r+.	50^{r}	...	.+.1.	40^{+}	+	.....	.	.
Chenopodium album	.1..	25^{1}	...	....+	20^{+}	.	a1.a.	60^{a}	.
Stellaria media	...a	25^{a}	...	..1+.	40^{+}	.	..++.	40^{+}	.
Sonchus arvensis	....	.	...	+.1..	40^{+}	+	..1+.	40^{+}	.
Lamium purpureum	....	.	..+	..++.	40^{+}	.	..r..	20^{r}	.
Galinsoga urticifolia	....	.	...	...ar	40^{r}	.	..r1.	40^{r}	1
Galeopsis bifida	..1.	25^{1}	...	....r	20^{r}	.	..++.	40^{+}	.
Galinsoga parviflora	....	.	..1	...a.	20^{a}	+	.....	.	+
Galeopsis tetrahit	1..b	50^{1}	...	...+.	20^{+}	.	.....	.	.
Senecio vulgaris	....	.	...	...+.	20^{+}	.	..+..	20^{+}	+
Geranium columbinum	....	.	..+	.....	.	.	..r..	20^{r}	+
Veronica arvensis	....	.	..+	..+..	20^{+}	.	.....	.	.
Tithymalus helioscopia	....	.	...	...+.	20^{+}	.	...r.	20^{r}	.
Chenopodium polyspermum	....	.	...	...+.	20^{+}	.	.....	.	+
Convolvulus arvensis	....	.	...	1....	20^{1}	.	.....	.	.
Sisymbrium officinale	....	.	...	.....	.	.	.....	.	a
***Molinio-Arrhenatheretea*:**									
Plantago major	+..+	50^{+}	..a	+.+11	80^{+}	.	++11.	80^{+}	+
Trifolium repens	3...	25^{3}	+++	.11.4	60^{1}	+	..1+.	40^{+}	.
Ranunculus repens	..1.	25^{1}	...	.++++	80^{+}	+	r.++.	60^{+}	.
Plantago lanceolata	+..+	50^{+}	+..	..+++	60^{+}	.	...+.	20^{+}	.
Trifolium pratense	+...	25^{+}	+..	.+..+	40^{+}	.	...++	40^{+}	.
Vicia cracca	r.+.	50^{r}	...	..+..	20^{+}	.	..r1+	60^{+}	.

Tab. 4. – cont.

Community	A		B	C		D	E		F
No. of relevé	11 4635	%	11 917	11 13075	%	1 9	1 1 28274	%	1 6
Potentilla anserina	....	.	.r.	.+...	20^{+}	.	++.++	80^{+}	.
Poa pratensis	+...	25^{+}	.+.	....+	20^{+}	.	1...+	40^{+}	.
Alopecurus pratensis	....	.	...	1.+..	40^{+}	.	.+..+	40^{+}	.
Ranunculus acris	+...	25^{+}	...	....+	20^{+}	.	..+..	20^{+}	.
Lolium perenne	....	.	1b.	..1..	20^{1}	.	.....	.	.
Phleum pratense	....	.	+..	..+..	20^{+}	.	1	20^{1}	.
***Artemisietea vulgaris, Galio-Urticetea*:**									
Elytrigia repens	+111	100^{1}	.1.	..1a+	60^{1}	.	+.aa+	80^{+}	.
Artemisia vulgaris	.+..	25^{+}	.r+	++.r.	60^{+}	.	.++b+	80^{+}	.
Medicago lupulina	..+.	25^{+}	++.	.....	.	.	+.++a	80^{+}	.
Urtica dioica	....	.	.+.	....r	20^{r}	.	+.1.+	60^{+}	r
Rumex obtusifolius	..1.	25^{1}	...	++...	40^{+}	.	+.1..	40^{+}	.
Tanacetum vulgare	...1	25^{1}	..+	...r.	20^{r}	.	..+.+	40^{+}	.
Dactylis glomerata	.1..	25^{1}	...	a....	20^{a}	.	...+.	20^{+}	.
Daucus carota	..+.	25^{+}	...	.....	.	.	+.+..	40^{+}	.
*Silene *alba*	..+.	25^{+}	...	.....	.	.	+..+.	40^{+}	.
Armoracia rusticana	....	.	...	..r..	20^{r}	.	..11.	40^{1}	.
Arctium sp.	....	.	...	...r.	20^{r}	.	..11.	40^{1}	.
Other taxa:									
Taraxacum sect. *Ruderalia*	r..+	50^{r}	1++	+..ar	60^{+}	b	+.+++	80^{+}	a
Poa annua	+...	25^{+}	++3	.+..1	40^{+}	.	+.+..	40^{+}	1
Cirsium arvense	+.+.	50^{+}	...	1+.++	80^{+}	b	...+.	20^{+}	.
Persicaria lapathifolia	..+.	25^{+}	..r	+..+a	60^{+}	.	..1+.	40^{+}	.
Polygonum arenastrum	11.+	75^{1}	...	.1..a	40^{1}	.	..1..	20^{1}	.
Matricaria discoidea	+...	25^{+}	...	.3..1	40^{1}	.	+.++.	60^{+}	.
Lapsana communis	..r.	25^{r}	...	+..+.	40^{+}	r	++...	40^{+}	.
Persicaria hydropiper	+.+.	50^{+}	...	.+..+	40^{+}	.	.b...	20^{b}	.
Agrostis stolonifera	+..+	50^{+}	...	....+	20^{+}	3	.+1..	40^{+}	.
Achillea millefolium	....	.	b1.	..+..	20^{+}	.	...+.	20^{+}	.
Rumex crispus	....	.	...	...++	40^{+}	.	..a.+	40^{+}	.
Rorippa palustris	+r..	50^{r}	...	1	20^{1}	.	.....	.	.
Mentha arvensis	....	.	...	+..+.	40^{+}	1	.....	.	.
Epilobium montanum	....	.	...	+....	20^{+}	.	+.+..	40^{+}	.

Taxa in one or two relevés:

E_1: *Acer campestre* juv. (3) +; *A. platanoides* juv. (2) +; *Acetosella vulgaris* (5) +, (10) +; *Aethusa cynapium* (12) +; *Ajuga reptans* (11) r; *Alchemilla vulgaris* agg. (5) +, (12) +; *Alliaria petiolata* (12) +; *Amaranthus powellii* (5) +; *Arenaria serpyllifolia* (9) +; *Arrhenatherum elatius* (10) 1; *Atriplex prostrata* (5) 1; *Bellis perennis* (9) r; *Bidens tripartita* (4) +; *Bromus arvensis* (10) +; *B. hordeaceus* (9) b; *Calamagrostis epigejos* (14) +; *Calystegia sepium* (3) +; *Carum carvi* (4) +; *Cerastium holosteoides* (4) +; *Chaerophyllum aromaticum* (4) +; *Chenopodium bonus-henricus* (12) +; *C. glaucum* (18) 1; *Cirsium oleraceum* (1) +; *C. rivulare* (1) +; *C. vulgare* (16) 1; *Crepis biennis* (18) +; *Datura stramonium* (4) r; *Epilobium ciliatum* (16) r; *E. collinum* (4) r; *Euphrasia *rostkoviana* (4) +, (5) +; *Festuca pratensis* (10) +; *F. rubra* agg. (17) +; *Filaginella uliginosa* (4) +, (5) +; *Fragaria vesca* (2) +; *Galium mollugo* (10) +, (12) +; *Geum urbanum* (2) +; *Glechoma hederacea* (9) +, (19) 1; *Glyceria fluitans* (5) +; *Heracleum sphondylium* (10) r, (12) 1; *Hesperis *matronalis* (14) a; *Hordeum distichon* (4) +, (5) 1; *Hypericum maculatum* (4) +; *Jacea phrygia* (1) +; *Juncus bufonius* (4) +; (7) r, *Lathyrus pratensis* (13) 1; *Lathyrus* sp. (7) r; *Leontodon autumnalis* (5) r; *Lotus corniculatus* (4) +, (5); *Lysimachia nummularia* (10) +; *Papaver rhoeas* (10) 1; *Pastinaca sativa* (7) r, (17) +; *Petasites hybridus* (7) 1, (12) +; *Phalaroides arundinacea*

(13) 1; *Pimpinella major* (7) r; *Poa trivialis* (6) +, (10) 1; *Raphanus raphanistrum* (7) +; *Roegneria canina* (12) +; *Rubus caesius* (7) 1; *Scrophularia nodosa* (12) +, (17) +; *Setaria pumila* (5) r; *Solanum tuberosum* (12) +; *Stellaria holostea* (18) +; *Symphytum officinale* (18) r; *Tithymalus peplus* (12) r; *Torilis japonica* (12) +; *Trifolium flexuosum* (12) 1, (17) +; *T. hybridum* (12) +; *Veronica chamaedrys* (10) 1, (12) +; *V. serpyllifolia* (4) +; *V. beccabunga* (13) +; *Vicia sepium* (4) r; *Viola arvensis* (10) 1, (12) +.

E_0: *Ceratodon purpureus* (16) 3.

Localities of relevés: (explanations see Tab. 1)

1. Oravská kotlina, v. Štefanov nad Oravou, abandoned field below the road, loamy-clayey soil, 524 m, 270°, 5°, 49 m ^{2}, 85%, 193253.00, 492131.00, 19. 7. 2006, JM.
2. Oravská kotlina, v. Štefanov nad Oravou, older heaps of loam and stones of various size, 580 m, 225°, 15°, 49 m ^{2}, 50%, 193248.00, 492141.00, 19. 7. 2006, JM.
3. Oravská vrchovina, v. Sedliacka Dubová, heap of loam near the bridge between railway station and dump, 513 m, 56 m^2, 255°, 25°, 60%, 192543.20, 491526.90, 2. 8. 2006, JM.
4. Podbeskydská vrchovina, v. Breza, N border of village, meadow near the cowshed, abandoned area on loamy-clayey soil with high share of skeleton, 687 m, 200°, 20°, 12.5 m ^{2}, 90%, 192259.70, 492338.10, 9. 8. 2006, JM & IJ.
5. Podbeskydská vrchovina, v. Breza, N border of the village, abandoned field, loamy-clayey soil, 687 m, 225°, 10°, 15 m ^{2}, 100%, 192259.70, 492338.10, 9. 8. 2006, JM & IJ.
6. Oravská kotlina, town Námestovo, near the bus station, near the footpath towards dried basin, loamy-gravel substratum, 605 m, 228°, 12°, 8 m ^{2}, 85%, 192853.30, 492411.40, 11. 8. 2006, JM & IJ.
7. Oravská vrchovina, v. Podbiel, heap of soil and stones of various sizes on the left side of the bridge, 565 m, 0°, 0°, 32 m ^{2}, 85%, 192926.10, 491833.10, 17. 8. 2006, JM.
8. Oravská vrchovina, town Tvrdošín, Krásnické, old dung hill, 590 m, 315°, 30°, 36 m ^{2}, 55%, 193303.00, 491857.00, 21. 8. 2006, JM.
9. Oravská vrchovina, v. Nižná, road verge of Matúškova street, in front of the house no. 466, warm, dry slope on loamy-sandy soil, 566 m, 156°, 10°, 2 m^2, 65%, 193139.60, 491828.60, 17. 6. 2007, JM.
10. Oravská vrchovina, v. Nižná, embankment of the Orava river, opposite to the house no. 476, heap of loamy-clayey material, 567 m, 0°, 0°, 15 m ^{2}, 65%, 193146.60, 491825.70, 17. 6. 2007, JM.
11. Oravská vrchovina, v. Podbiel, railway station, near toilets, warm place with remnants of masonry and gravel on loamy soil, 561 m, 178°, 3°, 2 m^2, 55%, 192843.40, 491813.10, 17. 6. 2007, JM.
12. Oravská kotlina, v. Hruštín, below the firehouse, heap of loamy-clayey soil, gravel and stones up to 60 cm, 690 m, 250°, 7°, 20 m ^{2}, 65%, 192051.30, 491929.80, 26. 7. 2007, JM.
13. Oravská kotlina, v. Lokca, above the Jednota-market, heap of loamy-clayey soil and stones, 641 m, 233°, 10°, 21 m ^{2}, 90%, 192442.30, 492159.60, 26. 7. 2007, JM.
14. Oravská kotlina, v. Lokca, near the former factory SEZ Lokca, heap of soil and skeleton, 649 m, 287°, 3°, 30 m ^{2}, 95%, 192450.40, 492154.80, 26. 7. 2007, JM.
15. Oravská Magura, v. Hruštín, S part of village, fringe of a dung hole, aerated humus-rich soil with high share of decomposed dung, 715 m, 0°, 0°, 15 m ^{2}, 100%, 192120.20, 491856.00, 28. 8. 2007, JM.
16. Oravská vrchovina, v. Horná Lehota, fringe of a footpath near the house no. 112, the heap of loamy humic soil, 533 m, 0°, 0°, 6 m ^{2}, 95%, 192542.40, 491536.90, 14. 9. 2007, JM.
17. Oravská vrchovina, v. Dlhá nad Oravou, railway station, sunny place on a margin of trackage, 512 m, 0°, 0°, 3.5 m ^{2}, 95%, 192656.20, 491553.60, 14. 9. 2007, JM.
18. Oravská vrchovina, v. Nižná, between old and new footbridge, heap of loamy-clayey soil, gravel and stones, 581 m, 206°, 3°, 40 m ^{2}, 80%, 193109.10, 491826.80, 17. 9. 2007, JM.
19. Oravská vrchovina, v. Nižná, Nižnianska roveň, older abandoned field 570 m, 0°, 0°, 36 m ^{2}, 100%, 193210.30, 491850.20, 17. 9. 2007, JM.

Tab. 5. Plant communities of the class *Artemisietea vulgaris* in the Horná Orava Region

A – *Cirsium arvense* community
B – *Stenactis annua* community
C – *Pastinaca sativa* community
D – *Echio-Melilotetum*
E – *Tanaceto-Artemisietum vulgaris*
F – *Poo compressae-Tussilaginetum*
G – *Artemisio vulgaris-Echinopetum sphaerocephali*
H – *Arctietum lappae*
I – *Plantagini–Poetum compressae*

Community	A		B	C		D		E		F		G	H		I
No. of relevé	13231		4	23333		212111124		2 21 12		1223		3	3		3
	500422	%	1	86345	%	7251678450	%	487631939	%	9061	%	9	1237	%	8
Cirsium arvense	**344555**	100^{4}	.	..+++	60^{+}	...+.+1.++	50^{+}	.+3ab.a..	56^{a}	.a.a	50^{a}	+	111+	100^{1}	.
Stenactis annua	.....	.	**4**	.....	.	.....	.	.....	.	....	.	.	....	.	.
Pastinaca sativa	.....	.	b	**34343**	100^{3}	1	10^{1}	.....	.	....	.	.	....	.	.
Melilotus albus	+.....	17^{+}	3	....+	20^{+}	**3b44544+a.**	90^{4}	.11..r..a	44^{1}	..1.	25^{1}	.	+..+	50^{+}	.
Medicago lupulina	.....	.	1	.+a.1	60^{1}	**1abbabr++1**	100^{1}	.r1+.+...	44^{+}	+..+	50^{+}	.	...+	25^{+}	1
Echium vulgare	.....	.	.	.....	.	**a.....43.**	30^{3}	.....	.	..+.	25^{+}	.	....	.	.
Melilotus officinalis	.....	.	.	.....	.	.....**4**	10^{4}	.....	.	....	.	.	....	.	.
Tanacetum vulgare	.11.+1	67^{1}	1	.+++1	80^{+}	111b11++b.	90^{1}	**b1b444445**	100^{4}	..1.	25^{1}	.	+...	25^{+}	.
Artemisia vulgaris	.1a...	33^{1}	1	a++a1	100^{1}	.+3+1.a+1.	70^{1}	**554aab333**	100^{3}	..1.	25^{1}	a	a++b	100^{+}	.
Tussilago farfara	.+..++	50^{+}	.	....+	20^{+}	3+a1....+.	50^{1}	..1.....	11^{1}	**4455**	100^{4}	.	....	.	.
Echinops sphaerocephalus	.....	.	.	.....	.	.....	.	.....	.	....	.	**5**	....	.	.
Arctium tomentosum	.+....	17^{+}	.	.....	.	.....	.	.b.a.....	22^{a}	....	.	a	**544.**	75^{4}	.
Arctium × ambiguum	..+...	17^{+}	.	.....	.	r...+...+.	30^{+}	......b.1	22^{1}	...1	25^{1}	.	**.11.**	50^{1}	.
Arctium minus	.....	.	.	.....	.	..+.....	10^{+}	a.....	11^{a}	....	.	.	**...4**	25^{4}	.
Poa compressa	.....	.	.	.....	.	.+.....	10^{+}	.....+...	11^{+}	....	.	.	....	.	**4**
***Dauco-Melilotion*:**															
Daucus carota	.....	.	1	+++.+	80^{+}	.3..++1.+.	50^{+}	+..+.....	22^{+}	....	.	.	....	.	.
Crepis biennis	.....	.	.	....+	20^{+}	..1r1....r	40^{r}	..++....+	33^{+}	.1..	25^{1}	.	....	.	.
Odontites vulgaris	...+..	17^{+}	3	....r	20^{r}	++...+...+	40^{+}	.....+...	11^{+}	....	.	.	...+	25^{+}	.
Medicago sativa	.....	.	.	+....	20^{+}	.....	.	.....+...	11^{+}	....	.	.	....	.	.
Carduus acanthoides	.....	.	.	.....	.	.+.....	10^{+}	.....+	11^{+}	....	.	.	....	.	.
Astragalus glycyphyllos	.....	.	.	.....	.	.....	.	...3.....	11^{3}	....	.	.	....	.	.
Medicago × varia	.....	.		.....	.	.....	.	.....a...	11^{a}	....	.	.	....	.	.
Medicago falcata	.....	.	.	.....	.	.....	.	.....	.	....	.	.	...+	25^{+}	.
***Artemisietea vulgaris*:**															
Elytrigia repens	.a3331	83^{3}	.	...1.	20^{1}	..11.+.+..	40^{+}	.1b13.11.	67^{1}	+11.	75^{1}	.	++11	100^{+}	1

Tab. 5. – cont.

Community	A		B	C		D		E		F		G	H		I
No. of relevé	13231		4	23333		212111124		2 21 12		1223		3	3		3
	500422	%	1	86345	%	7251678450	%	487631939	%	9061	%	9	1237	%	8
Armoracia rusticana	.aa...	33^{a}	.	..+..	20^{+}	.1....1...	20^{1}	.a.a...b.	33^{a}	.1..	25^{1}	.	1.11	75^{1}	.
*Silene *alba*	.....	.	.	+....	20^{+}	.......+..	10^{+}	.....1r.	22^{r}	....	.	.	1+++	100^{+}	.
Linaria vulgaris	.....	.	.	1....	20^{1}	.+........	10^{+}	....	.	....	.	.	....	.	.
Ballota nigra	.....	.	.	.....	.	....	.	....	.	....	.	.	...+	25^{+}	.
***Galio-Urticetea*:**															
Urtica dioica	.+++.+	67^{+}	.	...rr	40^{r}	..+.....	10^{+}	+a1+..1b+	78^{1}	r+..	50^{r}	2	++.+	75^{+}	.
Aegopodium podagraria	.1.+..	33^{+}	.	.+...	20^{+}	..1.1....	20^{1}	++.1b.+.+	67^{+}	++.+	75^{+}	.	...1	25^{1}	.
Heracleum sphondylium	...1..	17^{1}	.	...++	40^{+}	....	.	.+1.1.1.+	56^{1}	.r..	25^{r}	1	+++.	75^{+}	.
Galium aparine	.++...	33^{+}	.	.....	.	....	.	.+++..1+.	56^{+}	....	.	+	a.++	75^{+}	.
Rumex obtusifolius	++++..	67^{+}	.	.....	.	...+.....	10^{+}	.r++..+..	44^{+}	a...	25^{a}	+	....	.	.
Glechoma hederacea	.++...	33^{+}	.	.....	.	..+...+.1.	30^{+}	.+.1+.11.	56^{1}	...+	25^{+}	.	....	.	.
Chaerophyllum aromaticum	.1....	17^{1}	.	.....	.	........+.	10^{+}	1b++.....	44^{+}	..1.	25^{1}	b	+...	25^{+}	.
Poa trivialis	.....	.	.	.....	.	+..1.....	20^{+}	.+.+...aa	44^{+}	....	.	.	1+b.	75^{1}	.
Mentha longifolia	.....a	17^{a}	+	.....	.	......1...	10^{1}	..1+..b.+	44^{+}	....	.	.	....	.	.
Torilis japonica	.1....	17^{1}	.	.....	.	......a...	10^{a}	......1..	11^{1}	....	.	.	....	.	.
Myosoton aquaticum	...+.+	33^{+}	.	.....	.	....	.	........+	11^{+}	....	.	.	....	.	.
Angelica sylvestris	.....+	17^{+}	.	.....	.	...r......	10^{r}	...r..1..	22^{r}	....	.	.	....	.	.
Campanula rapunculoides	.....	.	.	....+	20^{+}	........+.	10^{+}	........+	11^{+}	....	.	.	....	.	.
Roegneria canina	.....	.	.	.....	.	+.........	10^{+}	a........	11^{a}	....	.	.	...a	25^{a}	.
Anthriscus sylvestris	.....	.	.	.....	.	.......+..	10^{+}	1........	11^{1}	....	.	.	...+	25^{+}	.
Other taxa:															
Taraxacum sect. *Ruderalia*	.+++1.	67^{+}	.	.+.+b	60^{+}	..+1b.+.a.	50^{1}	+.++++..1	67^{+}	++++	100^{+}	+	..++	50^{+}	1
Vicia cracca	.++..1	50^{+}	.	+.a.+	60^{+}	+a+.a11+..	70^{1}	.++++b+r+	89^{+}	..+.	25^{+}	.	....	.	.
Dactylis glomerata	.+1+1.	67^{+}	.	1.1..	40^{1}	..++.1...+	40^{+}	++.1++a.1	78^{+}	.++.	50^{+}	+	+++.	75^{+}	.
Ranunculus repens	...++.	33^{+}	1	3	20^{3}	+++..ab...	50^{+}	++b++.1a+	89^{+}	+1.+	75^{+}	.	...+	25^{+}	.
Equisetum arvense	1+.1+.	67^{+}	.	+1+.+	80^{+}	1b.....aa.	40^{a}	.+.+...++	44^{+}	.aa1	75^{a}	.	....	.	.
Achillea millefolium	...++.	33^{+}	3	.a+++	80^{+}	+.1.1.11.+	60^{1}	+++...++.	56^{+}	r+..	50^{r}	.	....	.	.
Phleum pratense	.+1.a.	50^{1}	.	..+..	20^{+}	+....a.+..	30^{+}	.+.++++++	78^{+}	.1..	25^{1}	+	.+.b	50^{+}	.
Potentilla anserina	+.+.+.	50^{+}	.	+.+b+	80^{+}	+.+..++...	40^{+}	..+..+...	22^{+}	+..+	50^{+}	.	.++.	50^{+}	.
Tripleurospermum perforatum	+...1.	33^{+}	.	....r	20^{r}	..+1.1..+.	40^{+}	+.+.....	22^{+}	+...	25^{+}	.	++1+	100^{+}	.
Lathyrus pratensis	.b+3.+	67^{+}	.	.+...	20^{+}	....11a..a	40^{1}	..1b1.+..	44^{1}	.1..	25^{1}	.	....	.	.
Plantago lanceolata	.++...	33^{+}	.	.1.r+	60^{+}	+++.+.+..1	60^{+}	.+.....+	22^{+}	....	.	.	....	.	.
Trifolium repens	1...+.	33^{+}	.	...+1	40^{+}	+.++..++..	50^{+}	1........	11^{1}	+...	25^{+}	.	...+	25^{+}	.

Tab. 5. – cont.

Community	A		B	C		D		E		F		G	H		I
No. of relevé	13231		4	23333		212111124		2 21 12		1223		3	3		3
	500422	%	1	86345	%	7251678450	%	487631939	%	9061	%	9	1237	%	8
Plantago major	+.....	17^{+}	a	....+	20^{+}	.....b....	10^{b}	1....+..+	33^{+}	++.+	75^{+}	.	.1+.	50^{+}	.
Agrostis gigantea	.1...b	33^{1}	.	.....	.	+.+.....	20^{+}	+..+.1+..	44^{+}	+...	25^{+}	.	+..+	50^{+}	.
Festuca pratensis	..b+..	33^{+}	.	..4.+	40^{+}	11+1.....4	50^{1}	.....+...	11^{+}	+...	25^{+}	.	....	.	.
Poa pratensis	...+a.	33^{+}	a	43...	40^{3}	....	.	+.++.+...	44^{+}	....	.	.	.b+.	50^{+}	.
Trifolium pratense	.....	.	b	.....	.	1..+b4...+	50^{1}	.....+..a	22^{+}	.1.+	50^{+}	.	....	.	.
Vicia sepium	..+1..	33^{+}	+	..+..	20^{+}	...r..r.+.	30^{r}	...+..+..	22^{+}	....	.	.	....	.	.
Trifolium hybridum	....+.	17^{+}	.	...r.	20^{r}	+.+a+3..+a	70^{+}	....	.	....	.	.	.+..	25^{+}	.
Galium mollugo	.+....	17^{+}	.	a.b.+	60^{a}	..+....1..	20^{+}	.+....b.1	33^{1}	....	.	.	....	.	.
Trifolium flexuosum	...++.	33^{+}	.	..+.a	40^{+}	.1.....+.	20^{+}	....+....	11^{+}	..+.	25^{+}	.	....	.	.
Symphytum officinale	+.....	17^{+}	+	....r	20^{r}	......b...	10^{b}	....+....	11^{+}	....	.	.	.++.	50^{+}	.
Agrostis stolonifera	..11..	33^{1}	3	..b..	20^{b}	1.........	10^{1}	.......b.	11^{b}	...1	25^{1}	.	....	.	.
Lotus corniculatus	.....	.	.	.+...	20^{+}	++..+.....	30^{+}	.....+..1	22^{+}	..+.	25^{+}	.	....	.	.
Leontodon autumnalis	.....	.	.	..++.	40^{+}	+.....+...	20^{+}	.....+..r	22^{r}	...+	25^{+}	.	....	.	.
Rumex crispus	.....	.	.	.....	.	r...+r....	30^{r}	....	.	....	.	.	++1+	100^{+}	.
Cirsium vulgare	.....	.	.	.....	.	......+...	10^{+}	.......1+	22^{+}	..+.	25^{+}	.	rr+.	75^{r}	.
Alchemilla vulgaris agg.	...+..	17^{+}	.	..a.+	40^{+}	+.....+...	20^{+}	..+.....	11^{+}	....	.	.	....	.	.
Petasites hybridus	...1..	17^{1}	.	.....	.	1...+.....	20^{+}	..+b....+	33^{+}	....	.	.	....	.	.
Atriplex patula	....+.	17^{+}	.	...+.	20^{+}	....	.	.r.....	11^{r}	1..r	50^{r}	+	....	.	+
Carex hirta	.+...+	33^{+}	.	.....	.	......1..1	20^{1}	.....a...	11^{a}	....	.	.	....	.	.
Sonchus arvensis	.....	.	.	...++	40^{+}	+.........	10^{+}	......r..	11^{r}	r...	25^{r}	.	....	.	.
Mentha arvensis	1...+.	33^{+}	.	.....	.	....	.	.......+.	11^{+}	....	.	.	..+.	25^{+}	.
Polygonum arenastrum	+.....	17^{+}	.	.....	.	...+.....	10^{+}	+........	11^{+}	a...	25^{a}	.	....	.	.
Veronica chamaedrys	...+..	17^{+}	.	.....	.	..+.....	10^{+}	......+1.	22^{+}	....	.	.	....	.	.
Fallopia convolvulus	....+.	17^{+}	.	.....	.	+.........	10^{+}	.+.....+.	22^{+}	....	.	.	....	.	.
Arrhenatherum elatius	.....	.	.	a....	20^{a}	.......b..	10^{b}	.....+...	11^{+}	....	.	.	....	.	+
Stellaria media	.....	.	.	....+	20^{+}	..r.....	10^{r}	....	.	+...	25^{+}	.	...+	25^{+}	.
Anthyllis vulneraria	.....	.	.	.....	.	r+..1...+.	40^{+}	....	.	....	.	.	....	.	.
Ranunculus acris	.....	.	.	.....	.	+..r.+....	30^{+}	....	.	..+.	25^{+}	.	....	.	.
Salix fragilis	.....	.	.	.....	.	.1.....	10^{1}	...r.1..r	33^{r}	....	.	.	....	.	.
Galeopsis bifida	.....	.	.	.....	.	....	.	..+.+..+.	33^{+}	+...	25^{+}	.	....	.	.
Convolvulus arvensis	1.....	17^{1}	.	.1...	20^{1}	......+...	10^{+}	....	.	....	.	.	....	.	.
Matricaria discoidea	+.....	17^{+}	.	.....	.	....	.	+........	11^{+}	+...	25^{+}	.	....	.	.
Capsella bursa-pastoris	+.....	17^{+}	.	.....	.	....	.	.r.....	11^{r}	....	.	.	...+	25^{+}	.

Tab. 5. – cont.

Community	A		B C		D		E		F		G H		I
No. of relevé	13231		4 23333		212111124		2 21 12		1223		3 3		3
	500422	%	1 86345	%	7251678450	%	487631939	%	9061	%	9 1237	%	8
Deschampsia cespitosa	....+.	17^{+}	. .....	.	..++.....	20^{+}	....	.	....	.	. ....	.	.
Jacea pseudophrygia	.....+	17^{+}	. ..+..	20^{+}	.+........	10^{+}	....	.	....	.	. ....	.	.
Hypericum perforatum	.....	.	. +....	20^{+}	.+.....1..	20^{+}	....	.	....	.	. ....	.	.
Jacea phrygia	.....	.	. .a...	20^{a}	..+.......	10^{+}	....+....	11^{+}	....	.	. ....	.	.
Geranium pratense	.....	.	. ..a+.	40^{+}	......+...	10^{+}	....	.	....	.	. ....	.	.
Salix caprea	.....	.	. .....	.	++..1.....	10^{1}	....	.	....	.	. ....	.	.
Salix purpurea	.....	.	. .....	.	+.........	10^{+}	...r..+..	22^{r}	....	.	. ....	.	.
Chenopodium strictum	.....	.	. .....	.	...1.....	10^{1}	.r.......	11^{r}	1...	25^{1}	. ....	.	.
Prunella vulgaris	.....	.	. .....	.	.....+..+	20^{+}	....	.	....	.	r	.	.
Epilobium ciliatum	.....	.	. .....	.	....	.	........+	11^{+}	.+..	25^{+}	. ..+.	25^{+}	.
Galeopsis tetrahit	.....	.	. .....	.	....	.	....	.	....	.	r r+..	50^{r}	.

Taxa in one or two relevés:

E_1: *Acer pseudoplatanus* juv. (15) r, (31) r; *Acetosella vulgaris* (34) +; 1; *Achillea ptarmica* (15) 1; *Aethusa cynapium* (9) 1; *Agrostis capillaris* (22) +, (23) +; *Allium carinatum* (6) +; *Alopecurus pratensis* (30) +; *Arenaria serpyllifolia* (22) +; *Avenula planiculmis* (34) 3, (35) 3; *Barbarea vulgaris* (9) +; *Betonica officinalis* (5) +; *Betula pendula* (7) r; *Bromus tectorum* (14) b; *Calamagrostis epigejos* (7) a, (25) b; *C. varia* (26) +; *Campanula trachelium* (22) +; *Carduus personata* (4) +; *Carex flacca* (7) +; *Carlina vulgaris* (22) r; *C. carvi* (2) 1, (16) +; *Cerastium holosteoides* (7) +, (22) +; *Chamerion angustifolium* (7) 1; *Chelidonium majus* (19) +; *Chenopodium album* (1) +, (15) r; *Cirsium rivulare* (24) +; *Conyza canadensis* (38) b; *Corylus avellana* juv. (27) +; *Cuscuta europaea* (39) +; *Epilobium hirsutum* (6) +, (25) +; *Erigeron acris* (22) +; *Eupatorium cannabinum* (23) 1; *Festuca arundinacea* (12) +; *F. gigantea* (23) +; *F. rubra* agg. (22) +; *Festuca* sp. (14) a; *Filaginella uliginosa* (5) +; *Galeopsis speciosa* (23) 1, (29) r; *Galeopsis* sp. (32) +; *Galinsoga parviflora* (35) r; *Galium album* (22) 1; *G. rivale* (23) 1; *Geranium robertianum* (14) +; *Geum urbanum* (39) +; *Holcus lanatus* (18) r; *Hypericum maculatum* (9) +, (24) +; *Impatiens parviflora* (34) +; *Juncus articulatus* (7) 1; *J. effusus* (7) 1; *Lamium purpureum* (31) r; *Lathyrus sylvestris* (36) +; *Lathyrus* sp. (25) +; *Leucanthemum vulgare* (16) +; *Lolium perenne* (5) 1, (31) +; *Lysimachia nemorum* (18) 1; *L. nummularia* (32) +; *Persicaria amphibia* (6) 1, (10) 1; *P. lapathifolia* (1) +, (17) +; *Phalaroides arundinacea* (11) 1, (12) +; *Picris hieracioides* (18) +; *Pimpinella major* (16) r, (38) +; *P. saxifraga* (22) +; *Poa angustifolia* (22) +; *P. annua* (5) +, (35) 1; *Potentilla reptans* (18) a, (28) +; *P. tabernaemontani* (15) 1; *Prunella vulgaris* (40) +; *Prunus spinosa* juv. (18) 1; *Rhinanthus minor* (11) +; *Rorippa palustris* (19) 1; *Rubus caesius* (6) 1, (18) r; *R. idaeus* (25) +, (39) r; *Salix* sp. juv. (18); *Scrophularia nodosa* (23) +, (25) +; *S. scopolii* (9) +; *Sedum album* (38) a; *S. sexangulare* (38) +; *Senecio ovatus* (23) 1, (27) 1; *S. viscosus* (38) r; *Silene vulgaris* (36) 1; *Sinapis arvensis* (34) 1, (37) +; *Sisymbrium officinale* (4) +; *Solidago canadensis* (41) +; *Sonchus oleraceus* (25) +, (31) r; *Sorbus aucuparia* juv. (20) r; *Stachys* sp. (18) r; *S. sylvatica* (23) 1; *Stellaria alsine* (21) +; *S. graminea* (6) +; *S. nemorum* (23) a; *Thymus pulegioides* (22) b; *Tithymalus cyparissias* (22) +, (36) 4; *Trifolium dubium* (5) +; *Triticum aestivum* (19) +; *Valeriana officinalis* (13) +, (18) +; *Veronica persica* (19) +; *Vicia tetrasperma* (37) +; *Xanthoxalis fontana* (5) 1.

Tab. 5. – cont.

E_0: *Brachythecium rivulare* (15) +; *B. rutabulum* (18) 1; *B. starkei* (36) b; *Bryum argenteum* (28) +, (38) +; *Calliergonella cuspidata* (18) 1, (29)b; *Ceratodon purpureus* (15) 1, (28) b; *Cirriphyllum piliferum* (29) 3; *Cratoneuron filicinum* (15) +; *Plagiomnium rostratum* (36) 1; *Thuidium* sp. (28) a; *Tortula muralis* (28) 1.

Localities of relevés: (explanations see Tab. 1)

1. Oravská kotlina, v. Lokca, NE 500 m, by the crossroad to Zákamenné v., ashes and organic rubbish, 630 m, 0°, 0°, 24 m ^{2}, 100%, 192448.00, 492213.00, 30. 7. 1995, IJ.
2. Oravská kotlina, v. Vasiľov, NW 500 m, road verge, below the pylon, 650 m, 0°, 0°, 32 m ^{2}, 100%, 192252.00, 492108.00, 30. 7. 1995, IJ.
3. Oravská kotlina, v. Vasiľov, NE 500 m, road verge, base of a slope, 650 m, 0°, 0°, 25 m ^{2}, 100%, 192349.00, 492112.00, 30. 7. 1995, IJ.
4. Oravská vrchovina, v. Podbiel, railway station, right bank of the Orava River, edge of the back road, gravel, 555 m, 0°, 0°, 20 m ^{2}, 95%, 192904.00, 491840.00, 26. 8. 1987, MZ.
5. Oravská vrchovina, v. Horná Lehota, by Váhostav, field margin, heap of topsoil, 540 m, 175°, 7°, 50 m^2, 40%, 192400.30, 491531.80, 2. 8. 2006, JM.
6. Podbeskydská vrchovina, v. Zubrohlava, cabin of water management company, river terrace of flysch sediments, 606 m, 0°, 0°, 40 m ^{2}, 100%, 193035.10, 492625.10, 8. 8. 2006, JM & IJ.
7. Oravská kotlina, v. Breza, opposite to the house no. 27, pile of gravely substrate, 671 m, 155°, 35 °, 15 m ^{2}, 85%, 192331.80, 492327.50, 9. 8. 2006, JM & IJ.
8, Oravská kotlina, v. Breza, N periphery of the village, ruderal site between road and stream, remnants of anthropogenic material, 680 m, 230°, 30°, 30 m ^{2}, 100%, 192256.30, 492331.70, 9. 8. 2006, JM & IJ.
9. Podbeskydská vrchovina, v. Zubrohlava, left bank of the river Polhoranka, ruderal site behind the cinema, clayey-loamy, humic, 612 m, 245°, 5°, 25 m ^{2}, 100%, 193034.60, 492653.40, 10. 8. 2006, JM & IJ.
10. Oravská kotlina, town Námestovo, NW embankment of polder behind the bridge, clayey-loamy soil, 607 m, 138°, 20°, 32 m ^{2}, 100%, 192842.40, 492488.90, 11. 8. 2006, JM & IJ.
11. Oravská kotlina, town Námestovo, by the mouth of Biela Orava, embankment between two polders, gravely-loamy, 607 m, 0°, 0°, 40 m ^{2}, 100%, 192843.00, 492403.10, 11. 8. 2006, JM & IJ.
12. Oravská kotlina, town Námestovo, embankment between two polders, by the mouth of the river Biela Orava, ruderal site, loamy substrate, 607 m, 330°, 10°, 32 m ^{2}, 100%, 192845.50, 492403.80, 11. 8. 2006, JM & IJ.
13. Oravská vrchovina, v. Podbiel, abandoned fields on SE periphery of the village, ruderal site, clayey-loamy, 561 m, 0°, 0°, 50 m ^{2}, 100%, 192922.60, 491837.40, 17. 8. 2006, JM.
14. Oravská vrchovina, v. Nižná, slope of safety barrier at the railway station, xerothermic slope, loamy, 567 m, 231°, 30°, 15 m ^{2}, 85%, 193137.80, 491834.70, 18. 6. 2007, JM.
15. Podbeskydská brázda, v. Sihelné, by the Jednota bus stop, pile of soil, gravel and ash, 768 m, 109°, 15°, 20 m ^{2}, 93%, 192414.40, 493053.70, 7. 12. 2007, JM.
16. Podbeskydská brázda, v. Rabča, by the football stadium, ruderal site, loamy-sandy, 650 m, 0°, 0°, 24 m ^{2}, 100%, 192735.70, 492946.90, 16. 7. 2007, JM.
17. Podbeskydská brázda, v. Rabča, by the bridge on the way to v. Sihelné, ruderal site, loamy-sandy, 644 m, 182°, 5°, 35 m ^{2}, 100%, 192740.20, 492943.20, 16. 7. 2007, JM.

Tab. 5. – cont.

18. Oravská vrchovina, v. Nižná, Nižnianska roveň, by the water main, disturbed site by the road, loamy, 571 m, 0°, 0°, 50 m ^{2}, 100%, 193207.00, 491847.90, 24. 7. 2007, JM.
19. Podbeskydská brázda, v. Mútne, parking lot, opposite to the house no. 108, with pile of soil and gravely-sandy-loamy material, 763 m, 156°, 5°, 8 m ^{2}, 80%, 192002.50, 492743.30, 4. 8. 2007, JM.
20. Podbeskydská brázda, v. Mútne, pile of clayey-gravely-loamy and rocky material below the house no. 81, 761 m, 179°, 8°, 20 m ^{2}, 95%, 192009.70, 492741.80, , 4. 8. 2007, JM.
21. Podbeskydská brázda, v. Mútne, pile of topsoil and big stones by the bus stop, 755 m, 89°, 5°, 24 m^2, 95%, 192021.10, 492739.30, 4. 8. 2007, JM.
22. Podbeskydská vrchovina, v. Oravská Jasenica, stone pit, rubble below the wall of the quarry, 619 m, 145°, 25°, 25 m ^{2}, 85%, 192646.80, 492332.50, 7. 8. 2007, JM & IJ.
23. Oravská Magura, Príslop saddle, ruderal site close to the parking lot in front of the Príslop restaurant, 825 m, 81°, 5°, 32 m ^{2}, 100%, 192110.60, 491811.90, 9. 8. 2007, JM.
24. Podbeskydská vrchovina, v. Zákamenné, ruderal site behind a house, app. 100 m from COOP Jednota, loamy-clayey, 682 m, 5°, 3°, 36 m ^{2}, 100%, 191822.50, 492307.40, 24. 8. 2007, JM.
25. Podbeskydská vrchovina, v. Zákamenné, heap of dug material, loam, sand, gravel and stones, 692 m, 131°, 30°, 36 m ^{2}, 65%, 191739.70, 492310.30, 24. 8. 2007, JM.
26. Podbeskydská vrchovina, v. Zákamenné, heap of dug material opposite to the house no. 707, loam, sand, gravel, stones, 689 m, 139°, 25°, 30 m^2, 95%, 191739.80, 492310.50, 24. 8. 2007, JM.
27. Podbeskydská vrchovina, v. Zákamenné, older heap of dug substrate next to the entrance to Colorspol comp., loamy-sandy-gravely substrate, 693 m, 202°, 40°, 40 m ^{2}, 100%, 191716.50, 492256.60, 24. 8. 2007, JM.
28. Podbeskydská vrchovina, v. Zákamenné, slope below the road at E periphery of the village, warm and xeric slope, older crumbling panel, 638 m, 170°, 35°, 32 m ^{2}, 95%, 192315.70, 492308.10, 24. 8. 2007, JM.
29. Podbeskydská brázda, v. Oravská Polhora, ruderal site behind the football stadium, loamy-gravely, iron scraps, 680 m, 0°, 0°, 40 m ^{2}, 90%, 192622.00, 493126.40, 27. 8. 2007, JM.
30. Oravská kotlina, v. Lokca, SW periphery of the village, on the way to Hruštín, ruderal site, clayey-loamy soil, 641 m, 0°, 0°, 36 m ^{2}, 100%, 192424.90, 492146.40, 28. 8. 2007, JM.
31. Podbeskydská brázda, v. Sihelné, below the house no. 378, heap of clayey-loamy soil, 766 m, 164°, 30°, 35 m ^{2}, 100%, 192419.80, 493049.80, 30. 8. 2007, JM.
32. Oravská kotlina, v. Bobrov, E end of the village, edge of the soil heap, 617 m, 274°, 20°, 40 m ^{2}, 95%, 193315.70, 492607.80, 31. 8. 2007, JM.
33. Oravská kotlina, v. Vavrečka, crossroad to Lokca and Oravská Jasenica, xerothermic slope, dark, well aerated sandy-loamy soil, with proportion of slag, 570 m, 319°, 3°, 32 m ^{2}, 100%, 192708.60, 492318.60, 3. 9. 2007, JM.
34. Oravská kotlina, OP, Prístav (port), road verge, 625 m, 169°, 5°, 25 m ^{2}, 95%, 193217.90, 492228.60, 3. 9. 2007, JM.
35. Oravská Magura, v. Štefanov, road from the main road to the village, road verge, dark, clayey-loamy soil with proportion of slag, 590 m, 231°, 7°, 30 m ^{2}, 100%, 193301.30, 492145.10, 3. 9. 2007, JM.

Tab. 5. – cont.

36. Oravská vrchovina, v. Krivá, railway station, xerothermic slope between the station and football stadium, 550 m, 152°, 25°, 30 m ^{2}, 100%, 192834.40, 491717.10, 16. 9. 2007, JM.
37. Oravská vrchovina, v. Dlhá nad Oravou, edge of the asphalt road to farming cooperative (roľnícke družstvo), 527 m, 180°, 20°, 25 m ^{2}, 95%, 192637.00, 491605.00, 27. 8. 1987, MZ.
38. Oravská vrchovina, v. Podbiel, railway station, auxiliary rail opposite to the main building, sand and gravel, 555 m, 0°, 0°, 7 m ^{2}, 80%, 192859.00, 491836.00, 26. 8. 1987, MZ & IJ.
39. Podbeskydská vrchovina, v. Vavrečka, edge of the road, slope leading to a stream, 650 m, 315°, 15°, 22.5 m ^{2}, 100%, 192803.00, 492310.00, 25. 8. 1987, IJ & MZ.
40. Oravská vrchovina, v. Nižná, pod Slatviňou, depression next to the road, loam and gravel, 575 m, 0°, 0°, 30 m ^{2}, 100%, 193209.60, 491857.10, 24. 7. 2007, JM.
41. Oravská vrchovina, v. Oravský Podzámok, xerothermic site by the railway station, loamy and well aerated substrate, 507 m, 0°, 0°, 30 m ^{2}, 100%, 192151.20, 491540.20, 25. 8. 2007, JM.

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