

THE HABITAT MAPPING IN SLOVENIA - CONNECTION TO THE VEGETATION UNITS

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ABSTRACT - A short history of vegetation researches in Slovenia is given in connection with the habitat mapping. Syntaxonomical units are compared to the units of Palearctic habitat classification (former Corine) and Natura 2000. The need of harmonisation has been found in some cases for all for the syntaxonomical units with southeastern distribution, i.e. alliances and suballiances *Aremonio-Fagion* (Ht. 1938) Török, Podani *et Borh.* 1989, *Epimedio-Fagenion* Marincek *et al.* 1993, *Lamio örvalae-Fagenion* Borh. ex Marincek *et al.* 1993, *Saxifrago rotundifoliae-Fagenion* Marincek *et al.* 1992 or *Fraxino orni-Ostryion carpinifoliae* Tomazic 1940, *Orno-Ericion* Ht. 1958, *Orno-Ericenion* Ht. (1957) 1958 and other. The missing units have been described. Proposed is the use of more exact names for habitat units.

KEY WORDS - Vegetation, habitat mapping, Slovenia, palearctic habitat classification.

INTRODUCTION

Prevailing methods of habitat mapping projects are based on phytocoenoses. These units are rather easy detectable, structurally uniform and therefore comparable among themselves. Different approaches are known, Palearctic habitat classification (former CORINE) (Devillers et Devillers-Terschuren, 1993) and Natura 2000 (Romão, 1996) or some more local one like in Bayern (Kaule *et al.*, 1978), in Österreich (Holzner, 1989) and other.

For different reasons and purposes but mainly for nature protection managing plans in Slovenia the initiative project for habitat mapping has been prepared and partly realised. In this first phase the results of vegetation researches in Slovenia as a part of European Vegetation Survey programme were used.

AN OVERVIEW OF VEGETATION RESEARCHES IN SLOVENIA

In Slovenia is rather long tradition of vegetation researches and in general the vegetation is well known but the knowledge for some group is still scarce or missing in the whole. We try to exceed these gaps by additional researches and in that process some young

postgraduate students are involved, as well. In last period were finished or are almost finished the studies of *syntaxa* *Scorzoneretalia villosae*, *Rhamno-Prunetea*, *Galio-Urticetea*, *Artemisietea*, *Pinion mugo* and some beech, spruce and flooded forests and aquatic vegetation, as well. Active participation in the project European Vegetation Survey stimulated us for preparation of the book *Vegetation of Slovenia*. The group of twelve scientists working on the vegetation confirmed the general structure of the texts. Some exemplar texts are written and a list of *syntaxa* that should be included in the book is prepared. In spite of efforts for additional financial support from Ministry of Republic Slovenia for science and technology until now we did not succeed and this was one reason among the other for slow progress.

HABITAT MAPPING

Few years ago a group from the Institute of Biology at the Centre of Scientific Research of the Slovenian Academy of Sciences and Arts, which has skills in vegetation researches and mapping, had begun to prepare the framework for habitat mapping in Slovenia on request of authorities in nature conservation agencies. The idea was to bring together scientists from different fields of work and institutions. This group tried to develop useful concept for national habitat mapping for nature conservation and basic research purposes.

Different existing patterns and methods proposed and used in other projects were taken into account. Finally were chosen types of vegetation as basic units. Faunistical, ecological and other data are of equivalent importance, as well. The outline scheme for habitat mapping of lowland Slovenia had been prepared (Carni, Dakskobler & Seliskar 1994, Carni *et al.* 1996). The main habitat types are forests, shrubs and forest edges, riparian vegetation, wetland vegetation, dry grasslands, salt marshes, urban vegetation and agricultural surfaces. Each group is divided into subgroups characterised by vegetation units (association, alliance, ordo, class), basic ecological and floristic structure. In first phase the habitat mapping of small area has been done in the field and we compared results with various methods of habitat mapping (Palearctic habitat classification, Natura 2000). One of the reasons for this was for near future planned habitat mapping in Slovenia according these methods.

RESULTS

The comparative table was produced and we found corresponding units and similarities with Palearctic habitat classification (or CORINE) and Natura 2000 classification on higher *syntaxonomical* level (suballiance, alliance or higher). 100 alliances and 18 suballiances from 38 classes found in Slovenia have been included in procedure (tab. 1). In this phase the communities were not taken in general into comparative interpretation because the comparison seems to be more difficult or even impossible. Nevertheless it could be stated that many classes found in Slovenia like *Phragmiti-Magnocaritetea*, *Lemneteta*, *Potametea* and their subordinate units including communities are in Palearctic habitat classification (Corine) manual direct comparable with habitat units. On the other hand it is almost impossible to incorporate our communities from class *Quercus-Fagetea* to Palearctic habitat classification of habitats.

In this group exists a great diversity of forests, including beech forests. They belong in Slovenia to east alpine, dinaric, illyric or subpannonic phytogeographic region and do not appear in central Europe, but they have important scientific and nature protection role, as well.

This means that Palearctic habitat classification should be completed and harmonised with additional information related to regional vegetation. Proposed are the following new units in the list of habitats (Devillers, & Devillers-Terschuren, 1993):

41.1C

South-eastern Alpine and Dinaric neutrophilous beech and beech-fir forests

Aremonio-Fagenion

Mesotrophic beech and beech-fir forests of south-eastern Alps and Dinaric mountains with *Anemone trifolia*, *Epimedium alpinum*, *Lamium orvala*, *Omphalodes verna*

41.1C1

Illyrian and subpannonian beech forests *Epimedio-Fagenion*

Mesotrophic beech forests of Illyric southern pre-Alps and subpannonian

41.1C2

Southern Alpine and Dinaric beech and beech-fir forests *Lamio orvalae-Fagenion*

Mesophilous and mesotrophic north-prealpine and south-prealpine Illyric beech and beech-fir forests with *Dentaria pentaphylla*, *D. polyphylla*, *D. trifolia*, *Lamium orvala* and *Scopolia carniolica*.

41.176

Ostryo-Fagenion Borh.63 (changed text)

Termophilous calcicolous forests rich in *Ostrya carpinifolia* and *Fraxinus ornus* of the sub-montane level of the Ligurian, Gardesian and Slovan pre-Alps and Slovenian pre-Dinaric, mostly reduced to tall coppice.

42.5 C

Eastern-prealpine Scotch pine forests *Fraxino orni-Ostryion carpinifoliae*

42.5 B

South-eastern European Scotch pine forests *Orno-Ericion* - subgroup South-eastern Alpine and Illyrian Scotch pine forests *Orno-Ericenion*.

Temophilous Scotch pine forests of the Dinaric mountains.

CONCLUSIONS

Comparing Palearctic habitat classification with the syntaxonomical system, in the Palearctic classification appears a lot of difficult understandable categories, where is not always clear what type of vegetation is meant under certain name of the habitat. On the other hand in Palearctic habitat classification the same type of vegetation appears in different habitats. This situation is normal in nature but makes great confusion in the system alone and in understanding of habitats and in practical work in the field.

We propose therefore to produce the opposite classification based on syntaxonomical system what would be more unambiguous. The statement of different habitat types should be prepared and added to each unit, such or in similar way as it is shown in the table 1 produced for the alliances found in Slovenia.

TABLE 1 - ALLIANCES OF SLOVENE VEGETATION AND CORRESPONDING CODES OF PALEARCTIC HABITAT CLASSIFICATION (PHC) AND NATURA 2000 (? = UNCLEAR OR UNCERTAIN CODE)

SLOVENE VEGETATION UNITS (class, order, alliance, suballiance)	Corine-PHC	Natura 2000	No. of ass. and subass. in Slovenia
<i>Quercetes ilicis</i> Br.-Bl. 1947			
<i>Quercetalia ilicis</i> Br.-Bl. (1931) 1936			
<i>Quercion ilicis</i> Br.-Bl. (1931) 1936	41.714	9340	2
<i>Paliuretes Tna.</i> 1973			
<i>Paliuretalia Tna.</i> 1973			
<i>Rhamno-Paliurion Tna.</i> (1973) 1993	32B7		1
<i>Querc-Fagetea</i> Br.-Bl. et Vlieg. 1937			
<i>Quercetalia pubescentis</i> Klika 1933			
<i>Quercetalia pubescentis-petraea</i> Klika corr. Moravec id Begun et Theunilac 1984	41.7		
<i>Ostryo-Carpinion orientalis</i> Ht. 1934 ed. 33	41.74 ?		12
<i>Ostryo-Carpinion</i> Ht. (1934) 1939			
<i>Fagetalia sylvatica</i> Paevl. 1923			
<i>Alnion incanae</i> Paevl. id Paevl. et. Walisch 1923	44.2		
<i>Alno-Ulmion</i> Br.-Bl. et R. Tx. 1943	44.3	91E 0	4
<i>Alnion glutinosae incanae</i> Oberd. 1933			
<i>Ulmion</i> Oberd. 1933			
<i>Erythronio-Carpinion betuli</i> (Ht. 1933) (Manáček id Wall., Nuc. et Grass 1993)	41.2 A		15
<i>Erythronio-Carpinion betuli</i> (Manáček 1994)			
<i>Tilio-Acerion</i> KLIKA 33	41.41	9180	8
<i>Arenonio-Fagion</i> (Ht. 1933) (Török, Podani et Bork. 1939)	41.1 C	?	22
<i>Epimedio-Fagion</i> (Manáček et al. 1993)			
<i>Lamio-orvalae-Fagion</i> Bork. et. (Manáček et al. 1993)	41.1 C 2 ?		
<i>Saxifrago rotundifoliae-Fagion</i> (Manáček et al. 1992)			
<i>Ostryo-Fagion</i> Bork. 1963	41.176		
<i>Fagion sylvatica</i> Luquet 1926	41.11	9110	2+7
<i>Luzulo-Fagion</i> Loeb. et Tx. 1934			
<i>Prunetalia spinosae</i> R. Tx. 1932			
<i>Berberidion vulgaris</i> Br.-Bl. 1930	31.812		3+1
<i>Pruno-Rubion fruticosi</i> (R. Tx. 1932) corr. Dougl. 1962	31.811		2+2
<i>Quercetalia roboris-petraea</i> R. Tx. 1932			
<i>Quercion roboris-petraea</i> Br.-Bl. 1932	41.5		15+17
<i>Vaccinio-Piceetes</i> Br.-Bl. ed. ed. Zupanič 1976	42	9410	
<i>Vaccinio-Picetalia</i> Br.-Bl. 1939 ed. ed. K. Luad 1967			
<i>Vaccinio-Piceion</i> Br.-Bl. 1939	42		27+9
<i>Abieti-Piceion</i> Br.-Bl. 1939	42.1-42.2		
<i>Vaccinio-Piceion</i> Oberd. 1937	42.2 ?		
<i>Piceion septentrionale</i> Br.-Bl. et Siss. 1939	?		
<i>Rhododendro-vaccinion</i> Br.-Bl. 1926	31.42 ?	4060	
<i>Pinion nugo</i> Paevl. 1923	31.5	4070	3
<i>Eriico-Pinetes</i> Ht. 1939			
<i>Eriico-Pinetalia</i> Oberd. 1949 ed. ed. Ht. 1939			
<i>Fraxino-orni-Ostryon carpiniifoliae</i> Tosažic 1940	42.5 C ?		4

Orno-Ericion Ht. 1933	?		5
Orno-Ericion Ht. (1937) 1933			
<i>Alnetes glutinosae</i> Br.-Bl. et R.Tx. 1943 ex Westhoff et al. 1946	44.9		
<i>Alnetalia glutinosae</i> R. Tx. 1937			
<i>Alnion glutinosae</i> (Malc. 1929) M. Dre. 1936	44.91		3
<i>Salicetes purpureae</i> Moor 1933	44.1		
<i>Salicetalia purpureae</i> Moor 1933			
<i>Salidion elaeagni</i> (Arch. 1933) Moor 1933	44.11		2
<i>Salidion albae</i> Soo 1933 ex Moor 1933	44.13		2
<i>Mulgedio-Acanthetetes</i> Hadac et Klirka et Klirka et Hadac 1944	31.6		
<i>Adenostyletalia</i> G. et J. Br.-Bl. 1931			
<i>Adenostylon illiaris</i> Br.-Bl. 1933	37.81		6
<i>Alnion viridis</i> Arch. 1933	31.61		1
<i>Salidion waldestinianae</i> Oberd. 1973	?		1
<i>Rumicetalia alpini</i> Mucicaria Kander et Mucicaria 1993			
<i>Rumicion alpini</i> Röbbel ex Klirka et Klirka et Hadac 1944	37.88		1
<i>Tri folio-Geranietes sanguinei</i> T.Müll. 1961	?		
<i>Origanetalia vulgaris</i> T.Müll. 1961			
<i>Geranium sanguinei</i> R.Tx. et T.Müll. 1961			5+1
<i>Tri folion medii</i> T.Müll. 1961			3+2
<i>Teucrion scorodoniae</i> De Foucault et al. 1979			1+1
<i>Dictamnno-Feruligion</i> Van Gils et al. 1973			5
<i>Rhamno-Prunetes</i> Rivas Goday et Borja Carboell 1961			
<i>Prunetalia spinosae</i> R.Tx. 1932			
<i>Berberidion vulgaris</i> Br.-Bl. 1930	31.82	3110	4+1
<i>Pruno-Rubion fruticosi</i> (R.Tx. 1932) corr. Doug 1962	31.811		2+2
<i>Lemnetes</i> de Bolòs et Masclaus 1933			
<i>Lemnetalia minoris</i> de Bolòs et Masclaus 1933			
<i>Lemnion minoris</i> de Bolòs et Masclaus 1933	22.41	3150	3
<i>Hydrocharietetalia</i> Röbbel 1933			
<i>Hydrocharition</i> Röbbel 1933	22.41	3150	3
<i>Utricularietalia minoris</i> Des Harog et Segal 1964			
<i>Utricularion vulgaris</i> Passage 1964	22.41	3150	11
<i>Zosteretes marinae</i> Figs. 1933			
<i>Zosteretalia marinae</i> Béguinot 1941			
<i>Zosterion marinae</i> Clust. 1934	23.212 ?		
<i>Ruppiales</i> J. Tx. 1960			
<i>Ruppialia</i> J. Tx. 1960			
<i>Ruppion maritimae</i> Br.-Bl. 1931 ex Des Harog et Segal 1964	23.211 ?		1
<i>Charetes fragilis</i> Putarek ex Krausch 1964	22.44	3140	?
<i>Charetalia hispidae</i> Sauer ex Krausch 1964			
<i>Charion fragilis</i> Krausch 1964			
<i>Charion vulgaris</i> (Krause ex Laeg 1977) Krause 1981			
<i>Thero-Salicornietes</i> Figs. 1933 ex R. Tx. 1933	15.1	1310	1
<i>Thero-Salicornetalia europaeae</i> Figs. 1933 ex R. Tx. 1933	15.11		
<i>Thero-Salicornion</i> (Br.-Bl. 1934) Tx. 1930			
<i>Juncetes maritimi</i> R. Tx. 1931			
<i>Juncetalia maritimi</i> Br.-Bl. 1931	13.5	1410	
<i>Jundion maritimi</i> Br.-Bl. 1931	13.51		1
<i>Arthrocnemetes fruticosi</i> Tx. et Oberd. 1933			
<i>Arthrocnemetalia fruticosi</i> Tx. et Oberd. 1933	15.6	1420	1
<i>Arthrocnemion fruticosi</i> Br.-Bl. 1931 ex Riv. Mart. et al. 1933	15.61		

Isoto-Nanojuncetes Br.-Bl. et R. Tx. 1943 et Westcott et al. 1946	22,3	3130	
Nanocyperetalia Klika 1933	22,32		
Nanocyperion Koldt ex Libbert 1932	22,321 ?		6
Bidentetes R. Tx. et al. id R. Tx. 1930			
Bidentetalia tripartita Br.-Bl. et R. Tx. ex Klika et Hadac 1944			
Bidenton tripartiti Nordhaged 1940 eab. R. Tx. id Poli et J. Tx. 1960	22,33		4
Chenopodioglauci Hejny 1974			
Stelarietes mediae R. Tx., Lohmeyer et Preisig id R. Tx. 1930	82,3 ?		
Stelarietalia cyani R. Tx., Lohmeyer et Preisig id R. Tx. 1930	?		?
Chenopodietalia alba R. Tx. (1937) 1930	?		?
Erogrosetalia J. Tx. ex Poli 1966	?		?
Sisymbrietalia J. Tx. id Lohmeyer et al. 1962			
Sisymbrio officinalis R. Tx., Lohmeyer et Preisig id R. Tx. 1930			1
Malvionneglectae (Guze 1966) Hejny 1973			1
Artemisietes vulgaris Lohmeyer et al. id R. Tx. 1930	87 ?		
Onopordetalia acanthii Br.-Bl. et R. Tx. ex Klika et Hadac 1944			
Drauco-M dilution Görs 1966			4
Arcton lappae R. Tx. 1937			4
Agropyretalia repentis Oberd. et al. 1967			
Convolvulo-Agropyron repentis Görs 1966			1
Galio-Urticetes Passarge ex Kopecky 1969			
Lamioalbi-Chenopodietalia boni-henrid Kopecky			
Galio-Alliarion (Oberd. 1937) Lohmeyer et Oberd. id Oberd. et al. 1967	37,72		7
Impatiens noli-tangere-Stachyion sylvaticae Görs ex Mucida 1993			1
Aegopodion podagrariae R. Tx. 1967	37,72		7
Convolvuetalia saxepium R. Tx. 1930 eab. Mucida 1993	37,7		
Convolvulion fluviatilis R. Tx. 1930	37,71		1
Petasion officinalis Sillager 1933			1
Utricularietes intermediominoris Petsch 1963			
Utricularietalia intermediominoris Petsch 1963			
Scorpidio-Utricularion minoris Petsch 1963	224,5 - 52,16		1
Potamietes R. Tx. et Preisig 1942			
Potametalia Koldt 1926			
Ranunculon fluviatilis Neubäusl 1939	224,32 - 24,4	3260	1
Potamion pectinatae (Koldt 1926) Görs 1977	224,22 ?	3150	8
Nymphaeion albae Oberd. 1937	224,31		3
Thlaspectes rotundifolii Br.-Bl. 1943			
Thlaspectalia rotundifolii Br.-Bl. id Br.-Bl. et Jeaay 1926	61,2	8120	
Thlaspion rotundifolii Jeaay-Lips 1930	61,22		7
Petasion paradoxii Zollitsch ex Lippert 1966	61,231		5
Peltarion alliaceae Horneae 1937			2
Arabidetalia caeruleae Röbel ex Br.-Bl. 1943	36,12		
Arabidion caeruleae Br.-Bl. 1913			3
Epilobietalia fleischeri Moor 1933	24,22	3230	
Epilobion fleischeri Br.-Bl. id J. et B. Br.-Bl. 1931			1
Salidion incanae Arckinger 1933			2
Galio-Parietarietalia officinalis Bozau et al. 1966			
Stipion calamagrostis Jeaay-Lips ex Br.-Bl. et al. 1932			2
Asplenietes trichomanis (Br.-Bl. id Meier et Br.-Bl. 1934) Oberd. 1977	62	8210	
Potentilletalia caulescentis Br.-Bl. id Br.-Bl. et Jeaay 1926	62,15	8215	
Androscedracion tomentosa et T. Wraber 1970	62,151 ?		4
Cystopteridion Richard 1972	62,152		1
Tortulo-Cymbalariaetalia Segal 1969			
Cymbalariaio-Asplenion Segal 1969 eab. Mucida 1993			4
Androscebaliom uliflorae Br.-Bl. id Meier et Br.-Bl. 1934		8220	
Asplenion septentrionalis Oberd. 1933			2

Asplenietalia glandulosa Br.-Bl. et Meier 1934	62.111	8210	
Centaureo-Campanulion Horváth 1934			2
Polygono-Poetia annuae Rivas-Martínez 1973 corr. Rivas-Martínez et al. 1991	?		
Polygono arenastri-Poetia annuae R. Tx. et Góssu et al. 1972 corr. Rivas-Martínez et al. 91			
Matricariomati caricoidis-Polygonion arenastri Rivas-Mart. 1973 corr. Rivas-Mart. et al. 91	?		3
Koderio-Corynephoretes Klika et Klika et Novák 1941			
Alyso-Sedetalia Morvec 1967			
Alysoalyssoideis-Sedion albi Oberd. et T. Müller et T. Müller 1961	34.11	6110	3
Montio-Cardaminetes Br.-Bl. et R. Tx. ex Klika et Hadac 1944 em. Zedlmeister 1993	54.1		
Montio-Cardaminetalia Paet. 1923 em. Zedlmeister 1993	54.12	7220	
Adianton Br.-Bl. ex Horváth 1939			2
Phragmit-Magnocaricetes Klika et Klika et Novák 1941	53		
Phragmitetalia Koch 1926			
Phragmiton communis Koch 1926	53.1		9
Magnocaricion dista Koch 1926	53.2		9
Caricion ostratae (Bal.-Tul. 1963) Oberd. et al. 1967			
Caricion gracilis (Neubáusi 1939) Oberd. et al. 1967			
Nasturtio-Glyceretalia Pignat. 1933			
Glycerio-Sparganion Br.-Bl. et Sisáček et Boer 1942	53.4		3
Oenanthetalia aquatica Hejdy et Kopecký et Hejdy 1963			
Oenanthon aquatica Hejdy ex Neubáusi 1939	?		4
Scheuchzeri-Caricetes fuscae R. Tx. 1937			
Scheuchzeretalia palustris Nordaaga 1937			
Rhynchosporion albae Koch 1926	54.6 ?	7130	3
Caricion lasiocarpae Vaudea Bergbela et Lebrun et al. 1949	54.5	7140	2
Caricetalia davalliana Br.-Bl. 1949	54.2		
Caricion davalliana Klika 1934	54.2	7230	2
Oxycocco-Sphagnetes Br.-Bl. et R. Tx. ex Westhoff et al. 1946	51		
Sphagnetalia agellanici (Paet. 1923) Moore (1964) 1963			
Sphagnion magellanici Kászner et Plöbner 1933	51.11	7110	6
Epilobietalia angustifoliae R. Tx. et Prágszky et R. Tx. 1939			
Atropetalia Vlieger 1937			
Atropion Br.-Bl. ex Aichinger 1933	31.8712		3
Sambuco-Salicion capreae R. Tx. et Neubáusi et R. Tx. 1939	31.872		2
Sedetia alba Oberd. 1973 corr. Oberd. 1990			
Sedetalia coerulea Br.-Bl. et Br.-Bl. et Jeday 1926			
Caricion firmae Gauss 1926	36.433		2
Sedetion coerulea Br.-Bl. et Br.-Bl. et Jeday 1926	36.43		3
Caricion ferruginea B. Br.-Bl. et J. Br.-Bl. 1931	36.41		3
Rhododendrohirsi-Ericetalia carnea Grabner et al. 1993			
Ericion carnea Röbel ex Grabner et al. 1993	?		
Salicetes herbaceae Br.-Bl. 1943	36.1		
Salicetalia herbaceae Br.-Bl. et Br.-Bl. et Jeday 1926	36.11		
Salicion herbaceae Br.-Bl. et Br.-Bl. et Jeday 1926	36.111		1
Festuco-Brometes Br.-Bl. et R. Tx. ex Klika et Hadac 1944			
Brometalia erecti Br.-Bl. 1926			
Bromion erecti Koch 1926	34.323 ?	6210	3
Scorzoneretalia villosae Horváth 1973			
Scorzonerion villosae Horváth 1949	?		1
Satureion subspicatae Ht. 1962	?		4
Molinio-Arrhenatheretes R. Tx. 1937 em. R. Tx. 1970			
Molinetalia Koch 1926	37.2- 37.3		

Molinion Kocki 1926	37.311	6410	4
Calthion R. Tx. 1937 sub. Bal.-Tul. 1973	37.21		
Calthion (R. Tx. 1937) Bal.-Tul. 1973			
Filipendulion (Loiseyeria Oberd. et al. 1967) Bal.-Tul. 1973	37.1		7
Deschampsion Hornsch 1930	?		1
Arrhenatheretalia R. Tx. 1931			
Arrhenatherion Kocki 1926	38.22		4
Cynosurion R. Tx. 1947	38.1		2
Poa alpinae-Trisetalia Ellsauer et Munda 1993			
Polygono-Trisetion Br.-Bl... et R. Tx. ex Marshall 1947	36.51- 36.3		
Poa alpinae Oberd. 1930	36.52		2
Potentillo-Polygonetalia R. Tx. 1947			
Potentillon anserinae R. Tx. 1947	?		4
Calluno-Ulicetes Br.-Bl. et R. Tx. ex Klira et Hadač 1944	31.2	40.30	
Vaccinio-Genistetalia Schubert 1960			
Genistion pilosae Du Roi 1942	?		1
Nardetalia Oberd. ex Preisig 1949	3.5.1 ?	6.280	
Violion caninae Schumcker 1944			1
Melampyro-Holcetalia Passarge 1979			
Melampyron pratensis Passarge 1979	?		1

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