

Arrhenatheretalia elatioris uncritical checklist of Europe

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Abstract. This paper presents a compilation of all syntaxa whenever related to the *Arrhenatheretalia elatioris* order at European level. Only those described according to the Braun-Blanquet approach are considered herein. The checklist consists of 15 alliances, 16 suballiances, 246 associations, 292 subassociations, 144 variants, 40 facies, and 36 plant communities without rank. The largest number of associations is encountered within the *Arrhenatherion* alliance – 93, followed by *Cynosurion* with 85 and *Polygono-Trisetion* with 25 associations. The most frequently mentioned associations in Europe are *Pastinaco sativae-Arrhenatheretum elatioris* (*Arrhenatherion*) cited for 22 countries and *Lolio perennis-Cynosuretum cristati* (*Cynosurion*) cited for 20 countries.

The checklist was compiled with the aim of revealing some of the existing syntaxonomical problems within the *Arrhenatheretalia* order. The numerous associations of some alliances suggest a suspiciously high syntaxonomical diversity. The current checklist offers a simple overview, but does not suggest a new classification system, nor any syntaxonomical revision. It could be used primarily as a starting point for any future large-scale analyses.

Key words: compilation, catalogue, mesic grasslands, nomenclature, overview, syntaxonomy, vegetation

Introduction

The order *Arrhenatheretalia elatioris* unites mainly secondary mesic grasslands, which have developed in places of former forests and are managed as hay meadows and pastures (Horvat 1960; Horvatić 1963; Rodwell & al. 2002). The order is well represented in Central and West Europe, but it could be found in the other parts of the continent too (Knapp 1979a, b). *Arrhenatheretalia elatioris* Tüxen 1931 is usually subordinated to the class *Molinio-Arrhenatheretea* Tüxen 1937 (Dierschke 1997; Pätzolt & Jansen 2004; Mucina & al. 2016). The order is typified by the alliance *Trisetio-Polygonion bistortae* Br.-Bl. 1949 ex 1950, mentioned as *lectotypus* (Dengler & al. 2003). At European level, many scientists have contributed to the knowledge of *Arrhenatheretalia* order. To mention only a couple of works from the last three decades, in Central and West

Europe it is studied by Ellmauer & Mucina (1993), Dierschke (1995, 1997), Jansen & Pätzolt (2001), Rodríguez-Rojo & Sánchez-Mata (2004, 2006), Hájková & al. (2007), Hegedúšová & Ružičková (2007), Janišová & al. (2007, 2010), Škodová (2007), Uhliarová & al. (2007), Rozbrojová & al. (2010), Allegrezza & Biondi (2011), Rodríguez-Rojo & al. (2014); and in the East and Southeast Europe by Sanda & Popescu (1991), Kojić & al. (2004, 2008), Stančić (2000, 2008a), Zelnik (2007), Didukh & Kuzemko (2009), Kuzemko (2009b, 2016), Velev & al. (2010, 2011a, b), Ačić & al. (2013a, b), Šilc & al. (2014) and Shushpannikova & Yamalov (2014). Among the latest classification systems in Europe are those proposed by Mucina & al. (2016) and Rodríguez-Rojo & al. (2017).

Even bearing in mind all above-mentioned studies and even assuming that supra-national studies of the palaeartic grasslands are frequently in the scientific

focus (Janišová & al. 2016), still there exists a big knowledge gap: a clear and complete taxonomical scheme of *Arrhenatheretalia* order at European level is lacking.

The purpose of this paper is to bring in one place all European syntaxa whenever related to the *Arrhenatheretalia* order. It is focused only on compiling all appropriate information and syntaxa related to this order, but does not suggest any classification schemes. Such work will contribute to a more profound understanding of the order in European context. It can be used as a base for further and more detailed classification schemes, particularly below alliance level.

Material and methods

The checklist was based on literature and a review of Internet sources. More than 500 bibliographic entities containing information about *Arrhenatheretalia* order were considered. The checklist consists of all subordinated to *Arrhenatheretalia* syntaxa, including plant communities without rank. Only syntaxa described according to the Braun-Blanquet approach (Braun-Blanquet 1965; Westhoff & van der Maarel 1973) were included. With the intention to demonstrate the full extent of *Arrhenatheretalia* order in its utmost completeness, all syntaxa in this work were brought in and presented just as taken from the publications. Original diagnoses, nomenclature types, syntaxa relation to higher ranks, diagnostic species and synonymy are presented here exactly as they come from the bibliographic sources, simply compiled, without any reconsideration or revision.

Syntaxa in the checklist are listed chronologically by decrease of their rank. Syntaxa published in the same year are listed alphabetically. All associations are listed within the alliances directly, disregarding the rank of suballiance, since the latter were accepted only by a few authors. Because of the varying authors' opinions, some associations are included within two alliances, while other are considered both as validly published and as synonyms. The associations, related to two or more alliances, are described in the checklist only once, and the place of their full description is mentioned.

A nomenclature block was prepared for every syntaxon, depending on the amount of available infor-

mation. Nomenclature blocks contain the following headings:

Original name: the original name of the syntaxon is given. This is the name comprising the original diagnosis, the type of the syntaxon.

Synonyms: all synonyms taken from literature and Internet sources are compiled and listed chronologically.

Corresponding names: according to ICPN (Def. X), the corresponding names are extracted from synonymy and presented separately after the synonyms.

Pseudonyms: following the recommendations of ICPN (Def. X; Recomm. 46J), all found pseudonyms are listed chronologically after the synonyms.

Homonyms: these were validly published names, but based on different nomenclature types and spelled identically (ICPN: Def. IX; Art. 31, 32, 33).

Remarks: any relevant information presented, or some controversial decisions found in synonymy are commented.

Diagnostic species: all diagnostic species taken from literature and Internet sources are compiled and listed alphabetically.

Distribution: alphabetical list of all countries the syntaxon is mentioned for.

Variations: syntaxa below association level (subassociation, variant, facies) are listed alphabetically first by countries and then chronologically. Subordinated syntaxa always start with „typicum”, if any, regardless of the year of publication.

References: the referred bibliographic sources are listed chronologically.

Abbreviations used in the text followed Weber & al. (2000):

Art. = Article (ICBN; ICPN)

Def. = Definition (ICPN)

excl. = exclusio

ICBN = International Code of Botanical Nomenclature

ICPN = International Code of Phytosociological Nomenclature

incl. = inclusio

nom. ambig. = nomen ambiguum (ICPN – Art. 36)

nom. conserv. propos. = nomen conservandum propositum (ICPN – Def. XIII; Principle II; Art. 22; 52)

nom. correct. = nomen correctum (ICPN – Art. 43; 44; 48d)

nom. illeg. = nomen illegitimum (ICPN – Art. 17; 34a)

nom. inval. = nomen invalidum (ICPN – Art. 1; 3; 4; 9; 10b; 11; 17; 29b)

nom. invers. = nomen inversum (ICPN – Art. 42; 48; Recomm. 42A)

nom. mut. = nomen mutatum (ICPN – Art. 48e)

nom. nud. = nomen nudum (ICPN – Recomm. 46D; 46E)

nom. prov. = nomen provisorium (ICPN – Art. 3b; 6)

nom. rejic. propos. = nomen rejiciendum propositum (ICPN – Art. 36; Recomm. 36A)

p. p. = pro parte

p. min. p. = pro minimo parte

p. max. p. = pro maximo parte

pro syn. = pro synonymo (ICPN – Recomm. 46F)

Recomm. = Recommendation (ICPN)

Syntax. syn. = Syntaxonomical synonym (ICPN – Def. X)

Results

The obtained checklist consists of 15 alliances, 16 suballiances, 246 associations, 292 subassociations, 144 variants, 40 facies, and 36 plant communities without rank (Annex 1). Alliance *Arrhenatherion elatioris* totals 93 associations, followed by *Cynosurion cristati* with 85 and *Polygono bistortae-Trisetion flavescens* with 25 associations (Table 1).

The most often mentioned associations in Europe are *Pastinaco sativae-Arrhenatheretum elatioris* (*Arrhenatherion*) cited for 22 countries and *Lolio perennis-Cynosuretum cristati* (*Cynosurion*) cited for 20 countries (cf. Annex 1). The countries richest in associations are France (64 associations cited), followed by Ukraine (48) and Romania (36) (Fig. 1).

Fig. 1. Number of associations related to *Arrhenatheretalia elatioris* per country. Synonyms and plant communities without rank not counted.

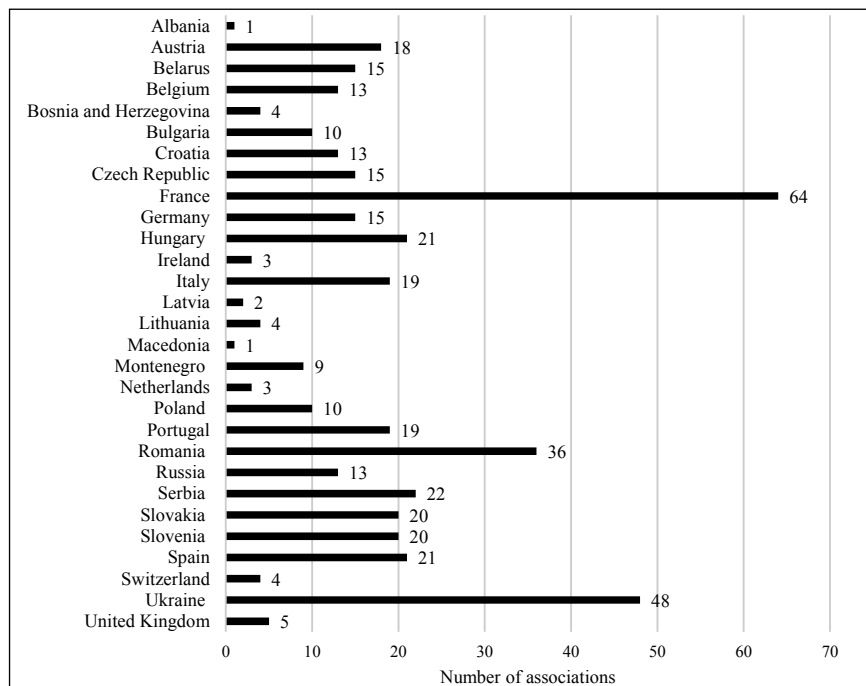


Table 1. A summary of all syntaxa whenever related to *Arrhenatheretalia elatioris*. Associations presented simultaneously in different alliances are counted only once. * – alliances recently reconsidered and extracted from synonymy as being separate syntaxa. ** – nomen provisorium. *** – recently described alliance, presumably related to *Arrhenatheretalia*.

Order	Alliance	Suballiance	Association	Subassociation	Variant	Facies	Plant community without rank	
	<i>Alchemillo-Ranunculion repentis</i> *							
	<i>Arrhenatherion elatioris</i>	4	93	148	51	20	18	
	<i>Brachypodio-Centaureion nemoralis</i> *							
	<i>Cynosurion cristati</i>	7	85	84	57	17	9	
<i>Arrhenatheretalia elatioris</i>	<i>Festucion pratensis</i>	1	21	35	20			
	<i>Helictotricho-Bistortion officinalis</i>		1		2			
	<i>Pančićion serbicae</i>		7	2				
	<i>Phyteumato-Trisetion</i> *							
	<i>Poion alpinae</i>		5				1	
	<i>Polygono-Trisetion flavescens</i>	4	25	20	11	3	3	
	<i>Potentilion-Ranunculion repentis</i> **							
	<i>Salvio pratensis-Dactylidion glomeratae</i>		3	3				
	<i>Rumicion thyrsoflori</i>		1					
	<i>Trifolio-Brizion elatioris</i>		1		3			
	Alliance not specified		4				3	
	? <i>Anthriscio sylvestris-Arrhenatherion</i> ***						2	
	Total	15	16	246	292	144	40	36

Discussion

The current *Arrhenatheretalia* catalogue is elaborated with the aim of revealing the existing syntaxonomical problems within this order, mostly below alliance level. It is intended mainly as a starting point for picking up some ideas for future large-scale analyses. For this purpose, such checklist needs to be rather raw and independent, so as not to be affiliated consciously to any recent classification scheme. The syntaxonomical syniopsis in this paper does not advocate a new classification system, nor any revision! On the contrary, it comes to reflect mostly the existing controversy about some syntaxa, synonymy and diagnostic species within *Arrhenatheretalia*. According to different authors, many syntaxa within this order are simultaneously considered as validly published and as synonyms. Such discrepancies should be generally resolved by applying large-scale analyses, as simple reference to literature will not be enough. Large-scale analyses could be done best with the help of the phytosociological databases included in the European Vegetation Archive (EVA; <http://euroveg.org/eva-database>; Chytrý & al. 2016) and the Global Index of Vegetation-Plot Databases (GIVD; <http://www.givd.info/>; Dengler & al. 2011).

A closer look at the checklist (cf. Annex 1) shows excessive syntaxonomical diversity within *Arrhenatheretalia* even at European scale: 15 alliances with 246 associations. With their publication *Vegetation of Europe*, Mucina & al. (2016) have solved this problem to some extent, since a new alliance of such grassland vegetation has arisen recently (cf. Rodríguez-Rojo & al. 2017).

Mucina & al. (2016) have proposed full reconsideration of the *Arrhenatheretalia* order in Europe, which now consists more realistically of eight alliances only. Rodríguez-Rojo & al. (2017) also invested much effort in classifying the lowland hay meadows and pastures from West and Central Europe into 36 associations.

Great many problems below alliance level still exist in *Arrhenatheretalia*. Syntaxonomically, the *Arrhenatherion* alliance has reached 93 associations. Here it seems appropriate to recall Braun-Blanquet's statement that an alliance must unify „the most closely related associations” (Braun-Blanquet 1965: 363). How closely then 93 associations could be related, or is such enormous syntaxonomical diversity real? Meanwhile, this misunderstanding is supported by many discrepancies in the authors ideas about the diagnoses of some syntaxa. Many synonyms encountered in literature are quite controversial.

Since vegetation classification is dynamic and evolving, the content of the *Arrhenatheretalia* order varies continuously. Being vitally dependent on accessibility of bibliographical sources, syntaxonomical diversity presented in this paper may lack some published syntaxa.

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Annex 1. Checklist of *Arrhenatheretalia elatioris* order.

Class MOLINIO-ARRHENATHERETEA Tüxen 1937

Order ARRHENATHERETALIA ELATIORIS Tüxen 1931

Original name: *Arrhenatheretalia* Tüxen 1931 nom. correct.

Synonyms: *Arrhenatheretalia elatioris* Pawłowski 1928 nom. nud. (Art. 2b; 8); *Arrhenatheretalia* Horvatic 1930; 1958 p. p.; *Arrhenatheretalia* Br.-Bl. 1931 (Art. 8); *Arrhenatheretalia* (Pawłowski 1926) Tüxen 1937; (*Trifolio*-) *Arrhenatheretalia* Oberd. 1949; *Plantaginetalia majoris* Tüxen (1947) 1950 p. p. (Art. 8; 29a); *Arrhenatheretalia elatioris* (Pawłowski 1928) Br.-Bl. 1949 ex Br.-Bl. 1950; *Plantaginetalia majoris* Tüxen ex von Rochow 1951

p. p.; *Arrhenatheretalia* Zeidler 1954 p. min. p.; *Lolietalia perennis* Doing 1963 (Art. 8); *Trifolio-Cynosuretalia* Sougnez & Limbourg 1963 nom. inval. (Art. 2d; 3b); *Trifolio-Phleetalia* (Sougnez & Limbourg 1963) Passarge 1969; *Trifolio repentis-Phleetalia pratensis* Passarge 1969; *Cynosuro-Phleetalia pratensis* Passarge 1969; *Festuco-Arrhenatheretalia* (Pawłowski & al. 1928) Passarge; 1969 *Galio-Achilletalia millefoliae* Passarge 1975; *Arrhenatheretalia elatioris* (Pawłowski 1928) Oberdorfer 1983; *Cynosuretalia cristati* de Foucault 1989; *Plantagini-Lolietalia* Mucina 1991 (Art. 8); *Poo alpinae-Trisetetalia* Ellmauer & Mucina in Mucina & al. 1993; *Plantagini-Prunelletalia* Ellmauer & Mucina 1993.

Annex 1. Continuation.

Corresponding names: *Arrhenatheretea* Br.-Bl. 1947; *Arrhenatherenea elatioris* de Foucault 1984; 1989; *Veronico serpyllifoliae-Cynosurenalia* de Foucault 1989; *Trisetenalia flavescens* Oberdorfer 1990; *Trifolienalia* Oberdorfer 1990. According to Ellmauer & Mucina (1993) incl.: *Phleo-Leontodion* (Br.-Bl. & Berset 1957) Dietl 1972.

Homonyms: *Arrhenatheretalia* Krajina 1933 (Art. 31).

Diagnostic species: *Achillea millefolium*, *A. pratensis*, *A. submillefolium*, *Agrostis capillaris*, *Alchemilla connivens*, *A. crinita*, *A. vulgaris*, *A. cymatophylla* (local for Krkonoše Mountains, Czech Republic), *A. subcrenata*, *Alopecurus pratensis*, *A. utriculatus*, *Anthoxanthum odoratum*, *Anthriscus sylvestris*, *Arrhenatherum elatius*, *Armeria elongata*, *Astrantia major*, *Avenula pubescens*, *Bellis perennis*, *Briza media*, *Bromus commutatus*, *B. hordeaceus*, *B. mollis*, *B. racemosus*, *Campanula patula*, *Cardamine matthiolii*, *Carex caryophylla*, *C. pallescens*, *Carum carvi*, *Centaurea jacea*, *C. phrygia*, *Cerastium arvense* (local for Krkonoše Mountains, Czech Republic), *C. holosteoides*, *Cichorium intybus*, *Crepis biennis*, *C. capillaris*, *Crocus albi-florus*, *C. biflorus*, *Cynosurus cristatus*, *Dactylis glomerata*, *Daucus carota*, *Eryngium planum*, *Equisetum pratense*, *Euphrasia stricta*, *Festuca pratensis*, *F. rubra*, *Fragaria vesca* (local for Krkonoše Mountains, Czech Republic), *Galium mollugo* agg., *G. boreale*, *Gaudinia fragilis*, *Gentiana utriculosa*, *Geranium pratense*, *Gladolus imbricatus*, *Heracleum sibiricum*, *H. sphondylium*, *Hieracium pilosella*, *H. umbellatum*, *Knautia arvensis*, *Lathyrus pratensis*, *Leontodon autumnalis*, *L. hispidus*, *Leucanthemum praecox*, *L. vulgare*, *Linum catharticum*, *Lotus corniculatus*, *Luzula campestris*, *Malva moschata*, *Medicago lupulina*, *Moenchia mantica*, *Narcissus poeticus*, *Ononis pseudihircina*, *Orchis coriophora*, *Ornithogalum umbellatum*, *Pastinaca sativa*, *Phleum pratense*, *Picris hieracioides*, *Pimpinella major*, *P. saxifraga*, *Plantago media*, *Polygala vulgaris*, *Prunella vulgaris*, *Ranunculus strigosus*, *Rhinanthus alectorolophus*, *R. angustifolius*, *R. mediterraneus*, *R. minor*, *R. rumelicus*, *Rhytidadelphus squarrosus*, *Rorippa pyrenaica*, *Rumex acetosa*, *R. crispus*, *Saxifraga granulata*, *Scabiosa columbaria*, *Scutellaria hastifolia*, *Senecio jacobaea*, *Silene vulgaris*, *Stellaria graminea*, *Taraxacum officinale*, *Tragopogon orientalis*, *T. pratensis*, *Traunsteinera globosa*, *Trifolium aureum*, *T. campestre*, *T. dubium*, *T. patens*, *T. pratense*, *T. repens*, *T. rubens*, *Trisetum flavescens*, *Verbascum blattaria*, *Veronica ar-*

vensis, *V. chamaedrys*, *V. serpyllifolia*, *Vicia angustifolia*, *V. cracca*, *V. sepium*, *Viola canina*.

References: Borza (1959); Cincović (1959); Horvat (1962; 1974); Horvatić (1963); Medvečka-Kornaš & al. (1966); Resmeriță (1970); Dihoru (1975); Blažková (1979); Mititelu & al. (1986, 1988); Coldea (1987, 1990); Ellenberg (1988); de Foucault (1989); Sanda & Popescu (1991); Ivan & al. (1993); Ellmauer & Mucina (1993); Oberdorfer (1993); Dierschke (1997; 1999); Kojić & al. (1997); Krahulec & al. (1997); Sanda & al. (1998, 2001); Stepanovich (2000); Bardat & al. (2001); Jansen & Pätzolt (2001); Mihăilescu (2001); Rivas-Martínez & al. (2001, 2002); Snowarski (2002-2005); Csörgő & Frink (2003); Kaligarić & al. (2003); Burkart & al. (2004); Pätzolt & Jansen (2004); Rodríguez-Rojo & Sánchez-Mata (2004); Mosek & Miazga (2006); Tomescu & al. (2006); Zelnik (2007); Solomakha (2008); Popescu & Boruz (2008); Stančić (2008a); Mucina & al. (2016).

Alliance ARRHENATHERION ELATIORIS Luquet 1926

Original name: *Arrhenatherion* Luquet 1926 (*Arrhenatherum elatius*).

Synonyms: *Arrhenatherion elatioris* Br.-Bl. 1925 p. p.; *Arrhenatherion elatioris* (Br.-Bl. 1925) Koch 1926; *Arrhenatherion elatioris* Koch 1926 nom. nud. (Art. 2b); *Arrhenatherion* Horvatić 1930; 1941; 1958; *Arrhenatherion elatioris* Tüxen 1931 (Art. 31); *Alopecurion utriculati* Zeidler 1954 p. p.; *Alopecurion pratensis* Passarge 1964 p. p.; *Dauco-Arrhenatherion* Passarge 1964; *Brachypodio pinnati-Centaureion nemoralis* Br.-Bl. 1967; *Agrostio-Festucion rubrae* Passarge 1969 p. max. p. non Pușcaru & al. 1956; *Polygalo-Festucion rubrae* Passarge 1969; *Phyteumato-Festucion rubrae* Passarge 1969; *Dauco-Arrhenatherion* Passarge 1969; *Triseto-Arrhenatherion* Passarge 1969; *Anthriscio-Heracleion* Passarge 1975 p. p.; *Hyperico-Vicion angustifoliae* Passarge 1975 p. max. p.; *Trifolio repentis-Lolion perennis* Dietl 1983 (Art. 5; 8). According to Ellmauer & Mucina (1993) *Alopecurion* Passarge 1964 is syntaxonomical synonym of *Arrhenatherion* Koch 1926. Mucina & al. (2016) include *Festucion pratensis* Sipailova & al. 1985 in the synonymy of *Arrhenatherion*.

Corresponding names: *Bromo erecti-Arrhenatherion* Rivas Goday & Rivas-Martínez 1963; *Trifolio-Arrhenatherion* Rivas Goday & Rivas-Martínez 1963; *Malvo-Arrhenatherion* Rivas Goday & Rivas-Martínez 1963.

Annex 1. Continuation.

Remarks: 1. Dierschke (1997) pointed *Alopecurion pratensis* Passarge 1964 as synonym of *Arrhenatherion elatioris* Koch 1926 (Syn.: *Arrhenatherion elatioris* Luquet 1926). Hájková (2007) and Hájková & al. (2007) presented *Alopecurion pratensis* Passarge 1964 as a synonym of *Deschampsion cespitosae* Horvatić 1930; 2. Mucina & al. (2016) accepted the synonym *Brachypodio-Centaureion nemoralis* Br.-Bl. 1967 as a separate syntaxon.

Diagnostic species: *Achillea asplenifolia*, *A. collina*, *A. millefolium*, *A. pannonica*, *A. pratensis*, *A. setacea*, *Agrimonia eupatoria*, *Agrostis gigantea*, *Ajuga reptans*, *Alchemilla vulgaris* agg. (всички видове с изкл. на *A. glaucescens*), *Alopecurus pratensis*, *Anthoxanthum alpinum*, *A. odoratum*, *Anthriscus sylvestris*, *Arrhenatherum elatius*, *Avenula pubescens*, *Bellis perennis*, *Bromus arvensis*, *B. mollis*, *B. racemosus*, *Campanula patula*, *C. rapunculus*, *Cardaminopsis arenosa*, *Carex pallescens*, *Carum carvi*, *Centaurea banatica*, *C. jacea*, *Cerastium holosteoides*, *Cirsium arvense*, *Colchicum autumnale*, *Coeloglossum viridae*, *Crepis biennis*, *Cruciata laevipes*, *Cynosurus cristatus*, *Dactylis glomerata*, *Daucus carota*, *Equisetum arvense*, *Euphorbia esula*, *Euphrasia stricta*, *Festuca arundinaceae*, *F. diffusa*, *F. heterophylla*, *F. nigrescens*, *F. pratensis*, *F. rubra*, *Galium mollugo* agg., *G. verum* agg., *Geranium pratense*, *Heracleum sphondylium*, *Hieracium murorum*, *Holcus lanatus*, *Hordelymus europaeus*, *Hypericum perforatum*, *Knautia arvensis* agg., *K. kitaibelii*, *Lathyrus pratensis*, *Leontodon hispidus*, *Leucanthemum ircutianum*, *L. vulgare*, *Linum catharticum*, *Lotus corniculatus*, *Luzula campestris*, *L. divulgata*, *L. multiflora*, *L. pallescens*, *L. sudetica*, *Malva moschata*, *Medicago lupulina*, *Melica uniflora*, *Odontites vulgaris*, *Ononis minutissima*, *O. repens*, *O. spinosa*, *Ornithogalum umbellatum*, *Orobanche caryophyllacea*, *Pastinaca sativa*, *Pedicularis schizocalyx*, *Peucedanum carvifolia*, *Phleum bertolonii*, *P. pratense*, *Phyteuma orbiculare*, *Pilosella caespitosa*, *Pimpinella major*, *P. saxifraga*, *Plantago lanceolata*, *P. media*, *Poa angustifolia*, *P. pratensis*, *Potentilla alba*, *P. argentea*, *Prunella grandiflora*, *P. vulgaris*, *Ranunculus acris*, *R. bulbosus*, *R. steveni*, *R. strigosus*, *Rhinanthus minor*, *Rubus caesius*, *Rumex acetosa*, *R. thyrsiflorus*, *Sanguisorba minor*, *Saxifraga bulbifera*, *S. granulata*, *Scabiosa columbaria*, *Senecio jacobea*, *Silene vulgaris*, *Stachys officinalis*, *Stellaria graminea*, *Taraxacum* Sect. *Ruderalia*, *Thlaspi caerule-scens*, *Thuidium philibertii*, *T. recognitum*, *Tragopogon*

orientalis, *T. pratensis*, *Trifolium campestre*, *T. dubium*, *T. flexuosum*, *T. hybridum*, *T. pratense*, *T. repens*, *Trisetum flavescens*, *Veronica chamaedrys*, *V. hederifolia*, *V. vindobonensis*, *Vicia cassubuca*, *V. cracca*, *V. sepium*, *V. tenuifolia*.

References: Borza (1959); Blečić & Tatić (1960); Horvat (1962); Horvatić (1963); Moravec (1965); Borza (1966); Medwečka-Kornaš & al. (1966); Jurko (1974); Blažková (1979); de Foucault (1984; 1989); Boşcaiu & Täuber (1985); Ellenberg (1988); Sanda & Popescu (1991); Ellmauer & Mucina (1993); Oberdorfer (1993); Zuidhoff & al. (1995); Dierschke (1997, 1999); Kojić & al. (1997); Krahulec & al. (1997); Sanda & al. (1998, 1999); Stepanovich (2000); Rivas-Martínez & al. (2001, 2002); Šeffler & al. (2002); Snowarski (2002-2005); Chytrý & Tichý (2003); Dutoit & al. (2003); Kabucis & al. (2003); Kaligaric & al. (2003); Burkart & al. (2004); Pázolt & Jansen (2004); Rodríguez-Rojo & Sánchez-Mata (2004); Sarbu & al. (2004); Meshinev & al (2005); Rasomavicius & al. (2006); Hájková (2007); Hájková & al. (2007); Rodwell & al. (2007); Uhliarová & al. (2007); Veen & al. (2007); Solomakha (2008); Jarolínek & al. (2008a); Škodová & Janišová (2008); Velev & al. (2010); Biondi & al. (2014); Mucina & al. (2016).

Suballiances related to *Arrhenatherion*:**Suball. *Centaureo jaceae-Arrhenatherenion elatioris* de Foucault 1989 nom. illeg. (Art. 22)**

Synonym: *Trifolio montani-Arrhenatherenion elatioris* Rivas Goday & Rivas Mart. 1963.

Suball. *Colchico autumnalis-Arrhenatherenion elatioris* de Foucault 1989 nom. correct. (Art. 41b)

Original name: *Colchico autumnale-Arrhenatherenion elatioris* de Foucault 1989.

Suball. *Rumici obtusifolii-Arrhenatherenion elatioris* de Foucault 1989**Suball. *Poo angustifoliae-Arrhenatherenion elatioris* Felzines 2012**

References: Bardat & al. (2001); Ferrez (2007).

Associations related to *Arrhenatherion*:**Ass. *Alchemillo-Trisetetum flavescens* Horvat 1931**

Distribution: Bosnia and Herzegovina.

Annex 1. Continuation.**Ass. Anthoxantho odorati-Agrostietum tenuis Sillinger 1933**

Remarks: for details see in alliance *Cynosurion*.

Ass. Holcetum lanati Issler 1934

Original name: *Holcus lanatus* Issler 1934.

Synonyms: *Holcetum lanati* Gams 1927 nom. nud. (Art. 2b).

Diagnostic species: *Carex ovalis*, *Cerastium lucorum*, *Cirsium canum*, *Holcus lanatus*, *Lychnis flos-cuculi*, *Plantago lanceolata*, *Rumex acetosella*, *Sanguisorba officinalis*, *Trifolium pratense*.

Distribution: Croatia, Czech Republic (also in *Deschampsion cespitosae*), Poland, Romania (in *Molinietalia caeruleae* Koch 1926, *Calthion palustris* Tüxen 1937; also in *Potentillo-Polygonetalia* Tüxen 1947, *Potentillion anserinae* Tüxen 1937), Slovakia (in *Deschampsion cespitosae* Horvatić 1930), Ukraine (as *Holcetum lanati* Issler 1936 in *Molinion* Koch 1926; also in *Alopecurion pratensis* Passarge 1964).

Variations: Czech Republic: var. *Arrhenatherum elatius*; var. *Carex hirta*; var. *Cirsium palustre*; Ukraine: subass. *caricetosum paniceae* Kuzemko 2009; subass. *festucetosum rubrae* Kuzemko 2009 with two variants – var. *typicum*, var. *Trifolium rubens*.

Ass. Festucetum pratensis Soó 1938 (Art. 36)

Synonyms: *Agrostio stoloniferae-Deschampsietum cespitosae* Ujvárosi 1947 p. p.; *Festuceum pratensis mezophilum* Csűrös 1970 (Art. 34a); *Cirsio cani-Festuceum pratensis* Májovski & Ružičková 1975 p. p.

Diagnostic species: *Cirsium canum*, *Bromus mollis*, *Dactylis glomerata*, *Festuca pratensis*, *F. rubra*, *Holcus lanatus*, *Phleum pratense*, *Poa pratensis*, *P. trivialis*.

Distribution: Belarus (also in *Festucion pratensis* Sipaylova & al 1985), Hungary (in *Deschampsion caespitosae*), Latvia, Lithuania, Romania (also in ord. *Molinietalia caeruleae* and *Deschampsietalia caespitosae* Horvatić 1956), Russia (in *Festucion pratensis*), Serbia [in *Agrostion albae (stoloniferae)* Soó (1933) 1971], Slovakia, Slovenia (as *Festucetum pratensis* Soó (1938) 1955 and *Festucetum pratensis* Soó 1958), Ukraine (in *Festucion pratensis*).

Variations: Belarus: subass. *typicum*; subass. *agrostidetosum vinealis* sensu Stepanovich 2000; subass. *alopecuretosum pratensis* sensu Stepanovich 2000; subass. *anthoxanthetosum odorati* sensu Stepanovich 2000; subass. *brometosum mollis* sensu Stepanovich 2000; subass. *cynosuretosum cristati* sensu Stepanovich 2000; subass. *dactylidetosum glomeratae* sensu Stepanovich 2000;

subass. *deschampsietosum cespitosae* sensu Stepanovich 2000; subass. *festucetosum rubrae* sensu Stepanovich 2000; subass. *geranietosum pratensi* sensu Stepanovich 2000; subass. *phleetosum pratensi* sensu Stepanovich 2000; subass. *poetosum pratensis* sensu Stepanovich 2000; subass. *poetosum trivialis* sensu Stepanovich 2000; subass. *trifolietosum hybridi* sensu Stepanovich 2000; subass. *trifolietosum pratensi* sensu Stepanovich 2000; Latvia: var. *typicum*; var. *Alopecurus pratensis*; var. *Galium boreale*; var. *Medicago falcata*; Lithuania: fac. *typicum*; fac. *Anthriscus sylvestris*; fac. *Bromopsis inermis*; fac. *Deschampsia caespitosa*; fac. *Elytrigia repens*; fac. *Lotus corniculatus*; fac. *Potentilla anserina*; fac. *Ranunculus acris*; fac. *Trifolium medium*; fac. *Stellaria graminea*; fac. *Urtica dioica*; Romania: subass. *transsilvanicum* Soó 1938; subass. *halophilum* Csűrös 1947; subass. *brometosum commutati* Soó 1957; subass. *poetosum trivialis* Soó 1957 (Syn.: *Poa trivialis-Festuca pratensis* Borza 1959); subass. *ranunculetosum acris* Juhász Nagy apud Soó 1957; subass. *alopecuretosum* Bodrogközy 1962; subass. *brometosum mollis-hordeacei* (Siroki ined.) apud Soó 1964; subass. *festucetosum pratensis* Soó 1964; subass. *poetosum pratensis* Soó 1964; subass. *caricetosum distantis* (Horv. 1930) Pázmány 1971; subass. *dactyletosum glomerati* Grigore 1971; subass. *festucetosum valesiaca* Gh. Popescu (1974) 1975; var. *Viola elatior*; var. *Galium mollugo* Danciu 1974; fac. *trifoliosum molinieri*; fac. *trifoliosum pallidi*; fac. *holcosum lanati*; Ukraine: subass. *typicum* with two variants – var. *typicum*, var. *Agrostis stolonifera*; subass. *anthoxanthetosum odorati* Kuzemko 2009; subass. *holcetosum lanati* Kuzemko 2009; subass. *koelerietosum delavignei* Kuzemko 2009.

Ass. Astrantio major-Arrhenatheretum elatioris Giunochet 1939

Distribution: France.

Ass. Poëto angustifoliae-Agrostidetum capillaris Soó & Csűrös 1947

Remarks: for details see in alliance *Cynosurion*.

Ass. Alchemillo-Trisetetum Horvat 1951 (Alchemilla sp. div., Trisetum flavescens)

Diagnostic species: *Alchemilla* sp. div., *Poa pratensis*, *Trisetum flavescens*.

Distribution: Croatia, Montenegro.

Ass. Arrhenathero-Brometum erecti Balázs 1951

Diagnostic species: *Arrhenatherum elatius*, *Bromus erectus*, *Coronilla varia*, *Dianthus cathusianorum*, *Salvia pratensis*, *Trifolium montanum*.

Distribution: Hungary.

Annex 1. Continuation.**Ass. *Festuco rubrae-Agrostetum capillaris* Horvat 1951**

Remarks: for details see in alliance *Cynosurion*.

Ass. *Polygono bistortae-Arrhenatheretum elatioris* Oberdorfer 1952

Distribution: France.

Ass. *Dactylido glomeratae-Festucetum arundinaceae* Tüxen ex W. Lohmeyer 1953

Distribution: France.

Ass. *Festucetum rubrae* (Domin 1923) Válek 1956

Diagnostic species: *Festuca rubra*.

Distribution: Belarus, Ukraine.

Variations: Belarus: subass. *typicum*; subass. *agrostidetosum tenuis* sensu Stepanovich 2000; subass. *anthoxanthetosum odorati* sensu Stepanovich 2000; subass. *brizetosum mediae* sensu Stepanovich 2000; subass. *brometosum mollis* sensu Stepanovich 2000; subass. *cynosuretosum cristati* sensu Stepanovich 2000; subass. *dactylidetosum glomeratae* sensu Stepanovich 2000; subass. *deschampsietosum cespitosae* sensu Stepanovich 2000; subass. *equisetetosum arvensi* sensu Stepanovich 2000; subass. *festucetosum pratensis* sensu Stepanovich 2000; subass. *poetosum angustifoliae* sensu Stepanovich 2000; subass. *rumecetosum thyr-siflori* sensu Stepanovich 2000; Ukraine: subass. *typicum*; subass. *brometosum mollis* Kuzemko 2009 with two variants – var. *typicum*, var. *Koeleria delavignei*; subass. *caricetosum flavae* Kuzemko 2009; subass. *festucetosum orientalis* Kuzemko 2009.

Ass. *Trifolieto-Alopecuretum pratensis* Cincović 1956 (*Trifolium pallidum*)

Synonyms: *Trifolium pallidum-Alopecurus pratensis* Cincović 1956.

Diagnostic species: *Alopecurus pratensis*, *Clematis integrifolia*, *Poa pratensis*, *Ranunculus polyanthemos*, *Trifolium pallidum*, *T. patens*.

Distribution: Serbia.

Variations: subass. *typicum*; subass. *caricetosum* Cincović 1956 (*Carex praecox*); subass. *rhinanthetosum rumelici* Cincović 1959; subass. *trifolietosum hybridi* Cincović 1959.

Ass. *Galio veri-Trifolietum repentis* Sougnez 1957

Remarks: for details see in alliance *Cynosurion*.

Ass. *Ophioglossu vulgati-Arrhenatheretum elatioris* P. Montserrat 1957

Remarks: According to Rodríguez-Rojo & al. (2014) incl.: *Odontito serotini-Trifolietum pratensis* O. Bolós & Masalles 1983, *Rhinantho mediterranei-*

Trisetetum flavescens Vigo 1984, *Tragopogono pratensis-Lolietum multiflori* P. Montserrat 1957.

Distribution: Iberian Peninsula.

Ass. *Poo-Trisetetum flavescens* Knapp ex Oberdorfer 1957

Original name: *Poa-Trisetetum* Knapp 1951 (*Poa pratensis*, *P. trivialis*, *Trisetum flavescens*).

Synonyms: *Trisetetum flavescens* (Stebler & Schröter) Brockmann-Jerosch 1907; *Trisetum flavescens-Poa pratensis* Knapp 1951 (Art. 3b); *Trisetum flavescens-Poetum pratensis* Knapp 1951; *Trifolio-Festucetum rubrae* Oberdorfer 1957 nom. prov. (Art. 3b); *Phyteumato-Festucetum* Passarge 1968; *Phleo-Agrostietum* Steinbuch 1980 (Art. 1); *Hyperico-Trisetetum* Hundt 1980; *Poo-Trisetetum flavescens* Knapp 1951. According to Oberdorfer (1993) incl.: *Trifolio-Festucetum rubrae* Oberdorfer 1957, *Trisetetum flavescens* Tüxen 1937.

Corresponding names: Plant community *Poa pratensis-Trisetum* sensu Dierschke 1997.

Pseudonyms: *Festuco-Cynosuretum cristati narde-tosum* sensu Jurko 1974 non Tüxen in Bükker 1942; *Luzulo-Cynosuretum cristati* sensu Jurko 1974 non Meisel 1961.

Remarks: According to Hájková & al. (2007) associations *Poo-Trisetetum flavescens* Knapp ex Oberdorfer 1957 and *Trifolio-Festucetum rubrae* Oberdorfer 1957 are synonyms. Sanda & Popescu (1991) accept these as different syntax and relate them to different alliances – *Poo-Trisetetum flavescens* in *Polygono-Trisetion* and *Trifolio-Festucetum rubrae* in *Cynosurion*. Krahulec & al. (1997) also accept the two associations as separate and refer them to *Arrhenatherion elatioris*.

Diagnostic species: *Agrostis capillaris*, *Alchemilla* sp. div., *Anthoxanthum odoratum* agg., *Campanula patula*, *Cardaminopsis halleri*, *Carum carvi*, *Centaurea melanocalathia*, *Chaerophyllum aureum*, *Leucanthe-mum vulgare* agg. (*L. ircutianum*, *L. vulgare*), *Persicaria bistorta* (= *Polygonum bistorta*), *Phleum pratense*, *Poa pratensis*, *Rhinanthus glacialis*, *Rumex obtusifolius*, *Trisetum flavescens*, *Veronica serpyllifolia*.

Distribution: Austria [in *Phyteumo-Trisetion* (Passarge 1969) Ellmauer & Mucina 1993], Czech Republic, Germany, Hungary, Romania [according to Dihoru (1975) and Sanda & Popescu (1991) in *Polygono-Trisetion*], Slovakia, Ukraine.

Variations: Czech Republic: subass. *poetosum trivialis* Blažková 1991; var. *Arrhenatherum elatius*; var.

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Hypericum maculatum; var. *Sanguisorba officinalis*; Romania: fac. *cardaminapsosum halleri*; fac. *chrysantemosum leucanthemi*; Slovakia: var. *Betonica officinalis*; var. *Hypericum maculatum*; var. *Sanguisorba officinalis* var. *Trisetum flavescens*; Ukraine: subass. *anthoxanthetosum odorati* Kuzemko 2009; subass. *galietosum mollugo* Kuzemko 2009.

Ass. *Tragopogono orientalis-Lolietum multiflori* P. Montserrat 1957

Distribution: Iberian Peninsula.

Ass. *Trifolio-Festucetum rubrae* Oberdorfer 1957

Remarks: for details see in alliance *Cynosurion*.

Ass. *Bromo racemosi-Cynosuretum cristati* Horvatić (1930) 1958

Synonyms: *Cynosuretum cristati* Horvatić 1930, *Bromus racemosus-Cynosurus cristatus* Horvatić 1941, *Cynosuretum cristati* Zeidler 1954, *Cynosutetum cristati* Kojić & al. 2003 s.l.

Diagnostic species: *Alopecurus utriculatus* (=A. *rendlei*), *Cynosurus cristatus*, *Gaudinia fragilis*, *Hordeum secalinum*, *Ononis arvensis*, *Ophioglossum vulgatum*, *Poa trivialis*, *Ranunculus acris*, *Rhinanthus minor*, *Trifolium patens*.

Distribution: Bulgaria (in *Cynosurion*), Croatia, Montenegro, Serbia, Slovenia.

Variations: Croatia: subass. *typicum*; subass. *holcetosum lanati* Horvatić 1930; subass. *brometum racemosi* Horvatić 1963; subass. *hypochoeridetosum radicatae* Hruška-Dell'Uomo 1976; subass. *danthonietosum* Šegulja 1977; Montenegro: subass. *holcetosum lanati* Horvatić 1930; Serbia: subass. *typicum*; subass. *brometum racemosi* sensu Cincović 1956.

Ass. *Colchico autumnalis-Festucetum pratensis* Duvigneaud 1958

Distribution: Belgium, France.

Variations: Belgium and France: subass. *typicum*; subass. *heracleetosum sphondylii* Trivaudey 1995; subass. *stachyetosum officinalis* Trivaudey 1995.

Ass. *Lino angustifolii-Cynosuretum cristati* Allorge ex Oberdorfer & Tüxen in Tüxen & Oberdorfer 1958

Remarks: for details see in alliance *Cynosurion*.

Ass. *Rumiceto-Agrostidetum caninae* Cincović 1959 (*Rumex acetosella*)

Diagnostic species: *Agrostis canina*, *Aira capillaris*, *Rumex acetosella*, *Trifolium filiforme*, *Vulpia myuros*.

Distribution: Serbia.

Ass. *Rhinantho-Cynosuretum cristati* Blečić & Tatić 1960

Original name: *Alectorolopho-Cynosuretum cristati* Blečić & Tatić 1960 (*Alectorolophus rumelicus* = *Rhinanthus rumelicus*).

Diagnostic species: *Cynosurus cristatus*, *Ophioglossum vulgatum*, *Poa trivialis*, *Rhinanthus rumelicus*.

Distribution: Serbia.

Variations: subass. *lupulinetosum* Blečić & Tatić 1960 (*Medicago lupulina*); subass. *auricometosum* Blečić & Tatić 1960 (*Ranunculus auricomus*).

Ass. *Alchemillo xanthochlorae-Arrhenatheretum elatioris* (Oberdorfer 1957) Sougnez & Limbourg 1963

Diagnostic species: *Alchemilla xanthochlora* (A. *vulgaris* agg.), *Cardamine pratensis*, *Colchicum autumnale*, *Crepis biennis*, *Knautia arvensis*, *Luzula campestris*, *Pimpinella major*.

Distribution: Belgium, France, Slovakia.

Variations: Belgium: subass. *typicum*; subass. *crepidetosum biennis* (Trivaudey 1995) Trivaudey in Ferrez 2007; subass. *knautietosum dipsacifolia* (Trivaudey 1995) Trivaudey in Ferrez 2007; France: subass. *typicum*; subass. *agrostietosum capillaris* (Trivaudey 1995) Trivaudey in Ferrez 2007; subass. *crepidetosum biennis* (Trivaudey 1995) Trivaudey in Ferrez 2007; subass. *knautietosum dipsacifolia* (Trivaudey 1995) Trivaudey in Ferrez 2007.

Ass. *Pastinaco sativae-Arrhenatheretum elatioris* Passarge 1964

Original name: *Pastinaco-Arrhenatheretum* (Knapp 1954) Passarge 1964 (*Pastinaca sativa*; *Arrhenatherum elatius*).

Synonyms: *Arrhenatheretum elatioris* Br.(-Bl.) 1915 nom. ambig. (Art. 36); *Arrhenatheretum elatioris* Br.-Bl. 1919 sensu lato; *Arrhenatheretum elatioris* Br.-Bl. 1919 ap. Br.-Bl. 1948; 1949; *Alopecuretum pratensis* Regel 1925 nom. ambig. (Art. 36); *Arrhenatheretum elatioris* Br.-Bl. ex Scherrer 1925 (Art. 31); *Arrhenatheretum elatioris* (Br.-Bl. 1925) Koch 1926; *Gaudinio-Arrhenatheretum* Br.-Bl. 1931 (Art. 29); *Arrhenatheretum elatioris* Tüxen 1937; *Arrhenatheretum medioeuropaeum* (Br.-Bl. 1919) Oberdorfer 1952 nom. illeg. (Art. 34a); *Arrhenatheretum medioeuropaeum* Oberdorfer 1952 ap. Oberdorfer 1957 nom. illeg. (Art. 34a); *Arrhenatheretum subatlanticum* Tüxen 1955 nom. illeg. (Art. 34a); *Centaureo nigrae-Arrhenatheretum* Oberdorfer (1952) 1957; *Melandrio-Arrhenatheretum* Oberdorfer 1957; *Alchemillo vulgaris-Arrhenatheretum* (Oberdorfer 1957) Sougnez & Limbourg 1963; *Agrostio-Festucetum*

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rubrae Stockhammer 1964 (Art. 7); *Polygalo-Festucetum rubrae* Passarge 1964; *Heracleo-Arrhenatheretum* Passarge 1964; *Pastinaco-Arrhenatheretum* Passarge 1964; *Alchemillo-Arrhenatheretum* (Oberdorfer 1957) Görs 1966 (Art. 29a); *Pastinaco-Arrhenatheretum* Passarge 1964; *Dauco carotae-Arrhenatheretum* Görs 1966; 1974 (Art. 29c); *Campanulo-Lathyretum pratensis* Passarge 1975; *Vicio-Galietum molluginis* Passarge 1975; *Dauco-Vicietum hirsutae* Passarge 1975 p. max. p.; *Chrysanthemo-Rumicietum thyrsoflori* Walthers 1977 p. max. p.; *Lolio-Arrhenatheretum* Dietl 1982 (Art. 7); *Filipendulo vulgaris-Arrhenatheretum* Hundt & Hübl 1983 p. p.; *Galio albi-Geraniatum pratensis* Passarge 1984 p. p.; *Tanaceto-Arrhenatheretum* A. Fischer 1985 p. max. p. (Art. 5); *Tanaceto-Arrhenatheretum* A. Fischer ex Ellmauer in Ellmauer & Mucina 1993; *Centaureo scabiosae-Arrhenatheretum* (Fartmann 1997) Passarge 1999 p. max. p.; *Filipendulo vulgaris-Ranunculetum polyanthemi* Hundt (1954) 1958 sensu Passarge 1999; *Galio albi-Alopecuretum pratensis* (Steffen 1931) Hundt 1958 sensu Passarge 1999 (Art. 29a); *Ranunculo repentis-Alopecuretum pratensis* Krisch 1974 sensu Passarge 1999 p. p.; *Plantagini lanceolatae-Festucetum rubrae* Scamoni sensu Passarge 1999 p. max. p.; *Achilleo millefolii-Lathyretum nissoliae* Passarge 2002.

According to Pätzolt & Jansen (2004) incl.: Plant community *Artemisia vulgaris-Arrhenatherum elatius* sensu Dierschke 1997 p. p., Plant community *Leucanthemum-Rumex thyrsoflorus* sensu Dierschke 1997, Plant community *Phalaris-Alopecurus pratensis* sensu Passarge 1999, Plant community *Festuca rubra-Agrostis tenuis* sensu Dierschke 1997 p. p., Plant community *Galium album-Alopecurus pratensis* sensu Rennwald 2002; excl.: *Pastinaco-Arrhenatheretum peucedanetosum oreoselini* Dengler 1994 p. max. p., *Ranunculo repentis-Alopecuretum pratensis phalaridetosum* Passarge 1999. According to Ellmauer & Mucina (1993) incl.: *Arrhenatheretum elatioris festucetosum rubrae* Sturm 1978 (Art. 1); non: *Arrhenatheretum elatixicifloris* Braun 1915.

Corresponding names: *Arrhenatheretum elatioris* Br.-Bl. 1919 subass. *medioeuropaeum* Horvatić 1941 ap. Horvatić-Tomažič 1941.

Remarks: 1) According to Pätzolt & Jansen (2004) *Ranunculo bulbosi-Arrhenatheretum elatioris* Ellmauer in Mucina & al. 1993 and *Arrhenatheretum elatioris* Br.-Bl. 1915 [Syntax. syn.: *Pastinaco sativae-Arrhenatheretum elatioris* Passarge 1964] are synonyms,

but Vicherek & al. 2000, Hájková & al. 2007, Uhliarová & al. 2007 and Stančić 2008a) consider these two associations as different syntaxa; 2) Hájková (2007), Hájková & al. 2007 and Jarolímek & al. (2008b) pointed *Alopecuretum pratensis* Regel 1925 as synonym of *Poa trivialis-Alopecuretum pratensis* Regel 1925 (*Deschampsion*). According to Pätzolt & Jansen (2004) *Alopecuretum pratensis* Regel 1925 is syntaxonomical synonym of *Arrhenatheretum elatioris* Br.-Bl. 1915 (Syn.: *Pastinaco sativae-Arrhenatheretum elatioris* Passarge 1964); 3) Kovács (2004) pointed *Alopecuretum pratensis* Regel 1925 s. l. as synonym of *Carici vulpinae-Alopecuretum pratensis* (Máthé & Kovács 1967) Soó 1971 corr. Borhidi 1996 [Syn.: *Alopecuretum pratensis* Nowinski 1928 (Art. 36); *Carici-Alopecuretum pratensis* Soó 1971 (Art. 3); *Ranunculo repentis-Alopecuretum pratensis* Ellmauer 1993 p. p.] and refer all these syntaxa to *Deschampsion caespitosae* Horvatić 1930.

Diagnostic species: *Achillea millefolium* agg., *Agrostis capillaris*, *Anthoxanthum odoratum*, *Arrhenatherum elatius*, *Avenula pubescens*, *Campanula patula*, *Carex sylvatica*, *Cerastium holosteoides*, *Crepis biennis*, *Dactylis glomerata*, *Daucus carota*, *Elymus repens*, *Festuca pratensis*, *F. rubra* agg., *Galium mollugo* agg., *Geranium pratense*, *Holcus lanatus*, *Knautia arvensis*, *Leontodon hispidus*, *Leucanthemum vulgare* agg., *Lotus corniculatus*, *Pastinaca sativa*, *Peucedanum carvifolia*, *Plantago altissima*, *P. lanceolata*, *Poa pratensis* agg., *Ranunculus acris*, *Rumex acetosa*, *R. thyrsoflorus*, *Taraxacum* Sect. *Ruderalia*, *Tragopogon dubius*, *T. orientalis*, *T. pratensis*, *Trifolium pratense*, *T. repens*, *Trisetum flavescens*.

Distribution: Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, France, Germany, Hungary, Lithuania (in *Alopecurion pratensis* Passarge 1964), Montenegro, Netherlands, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Switzerland, Ukraine, United Kingdom.

Variations: Austria: subass. *typicum* Knapp 1954; subass. *alchemilletosum* (Sougnéz & Limbourg 1963) Ellmauer 1995; Bulgaria: var. *Central Balkan Geographic Variant*; Croatia: subass. *typicum* sensu Ellenberg 1996; subass. *hircinetosum* Horvatić (1956) 1958 (Syn.: *Arrhenatheretum elatioris* var. *orientalis* Horvatić 1941); subass. *litorale* Horvat 1961; Czech Republic: subass. *typicum* sensu Oberdorfer 1952; subass. *cirsietosum cani* (Vicherek 1962) Vicherek in Vicherek & al. 2000 (Orig. name: *Arrhenatheretum elatioris* subass. *Cirsium canum* Vicherek 1962); France: subass. *typicum*; subass.

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brometosum erecti Oberdorfer 1936; Poland: subass. *typicum* sensu Oberdorfer 1952; subass. *alopecuretosum pratensis* Tüxen 1937; var. *typicum*; var. *Alopecurus pratensis*; var. *Armeria maritima*; var. *Dactylis glomerata*; var. *Deschampsia caespitosa*; var. *Poa trivialis*; Romania: subass. *typicum* sensu Oberdorfer 1952; subass. *trisetosum flavescens* Horvatič 1930; subass. *brometosum erecti* Oberdorfer 1936; subass. *alopecuretosum pratensis* Tüxen 1937; subass. *festucetosum pratensis* (Soó 1940) Slavnić 1948; subass. *festucetosum rubrae* Tüxen 1951 (Corresp. name: *Arrhenathero-Festucetum rubrae* Resmeriță 1958; 1963); subass. *festucetosum rupicolae* Egger 1958 (*festucetosum sulcatae* Egger 1958; *Festuca rupicola* = *F. sulcata*) [Corresp. name: *Arrhenathero-Festucetum rupicolae* Soó apud Borza 1963; Resmeriță 1958 (*Arrhenathero-Festucetum sulcatae* Soó apud Borza 1963; Resmeriță 1958)]; subass. *moenchetosum manticae* Borza & Boșcaiu 1960; 1963; subass. *holcetosum lanati* Csűrös 1970; fac. *festucosum pratensis*; fac. *dactyliosum glomeratae*; fac. *poosum pratensis*; fac. *trifoliosum pratensis*; Serbia: subass. *festucetosum arundinaceae* Ilijanić & Šegulja 1978; subass. *salvietosum nemorosae* Ilijanić & Šegulja 1978; Slovenia: subass. *typicum* sensu Passarge 1964; subass. *medicagetosum lupulinae* Passarge 1964; subass. *lolietosum* Petras Sackl & al. 2012; Spain: subass. *geranietosum dissecti* O. Bolòs 1959; subass. *arrhenatheretosum* O. Bolòs 1983; subass. *brometosum erecti* O. Bolòs 1983; subass. *holcetosum lanati* O. Bolòs 1983; Ukraine: subass. *typicum* with var. *Mentha arvensis*; subass. *galietosum mollugo* Kuzemko 2009 with two variants – var. *typicum*, var. *Festuca ovina*; subass. *trifolietosum dubii* Kuzemko 2009.

There are two homonyms within the variations – *Arrhenatheretum elatioris* Br.-Bl. ex Scherrer 1925 subass. *typicum* sensu Oberdorfer 1952 and *Arrhenatheretum elatioris* Br.(-Bl.) 1915 subass. *typicum* sensu Ellenberg 1996.

Ass. Trifolio-Cynosuretum cristati Veljović 1967 (*Trifolium patens*)

Diagnostic species: *Cynosurus cristatus*, *Festuca pratensis*, *Potentilla reptans*, *Rhinanthus minor*, *Taraxacum officinale*, *Trifolium patens*.

Distribution: Serbia.

Ass. Filipendulo-Arrhenatheretum Shimwell 1968

Distribution: United Kingdom.

Ass. Cichorietum intybi Tüxen ex Sissingh 1969

Synonyms: *Cichorietum intybi* Tüxen 1942 (Art. 1). According to Dengler & Wollert (2004) incl.: plant

community *Artemisia vulgaris* sensu Wollert 1991 p. p., plant community *Cichorium intybus* sensu Pott 1995, *Plantagini-Lolietum perennis cichorietosum* sensu Sýkora & al. 1996 p. max. p., plant community *Cichorium intybus* sensu Weeda & Scaminée 1998.

Diagnostic species: *Cichorium intybus* (usually as dominant).

Distribution: Austria, Germany (in *Dauco carotae-Melilotion* Görs ex Rostański & Gutte 1971), Romania, Slovenia.

Ass. Rhinantho-Filipenduletum Ilijanić 1969

Diagnostic species: *Filipendula vulgaris*, *Fragaria viridis*, *Rhinanthus rumelicus*.

Distribution: Croatia.

Ass. Agrostio castellanae-Arrhenatheretum bulbosi Teles 1970

Distribution: Iberian Peninsula.

Ass. Trifolio-Armerietum canescentis K. Tomić 1970

Distribution: Montenegro.

Ass. Alopecuro-Arrhenatheretum (Mátthe & Kovács 1960) Soó 1971

Synonyms: *Arrhenatheretum elatioris alopecuretosum* Tüxen 1937.

Diagnostic species: *Alchemilla vulgaris* agg., *Arrhenatherum elatius*, *Alopecurus pratensis*, *Geranium pratense*, *Sanguisorba officinalis*.

Distribution: Hungary, Romania.

Ass. Anthyllidi-Trifolietum montani Pawłowski 1971

Distribution: Ukraine.

Ass. Anthyllido vulnerariae-Festucetum rubrae (Mátthe & Kovács 1960) Soó 1971

Remarks: for details see in alliance *Cynosurion*.

Ass. Armerio-Trisetetum flavescens (Feri 1974) Rexhepi 1974

Distribution: Serbia.

Ass. Lolietum multiflorae Dietl & Lehmann 1975

Diagnostic species: *Achillea millefolium*, *Lolium multiflorum* (обикновено като доминант), *Plantago lanceolata*, *Poa trivialis*, *Ranunculus acris*, *R. repens*, *Rumex acetosa*, *Taraxacum officinale*, *Trifolium repens*.

Distribution: Austria, Croatia, Slovenia, Switzerland.

Ass. Phyteumato orbicularis-Arrhenatheretum elatioris Royer 1975

Diagnostic species: *Colchicum autumnale*, *Narcissus poeticus*, *Dichloropetalum carvifolia*, *Phyteuma orbiculare*.

Distribution: France.

Annex 1. Continuation.**Ass. *Pimpinello majoris-Arrhenatheretum elatioris* Richard 1975**

Distribution: France.

Ass. *Trifolio-Poëtum pratensis* (Răvărut & al. 1956) Resmeriță 1975 (*Trifolium pratense*)

Original name: *Poëtum pratensis* Răvărut & al. 1956.

Diagnostic species: *Poa pratensis*, *Trifolium pratense*.

Distribution: Romania (also in *Agrostion stoloniferae* Soó (1933) 1971, *Molinietalia caeruleae* Koch 1926).

Ass. *Cynosuro-Agrostidetum albae* Mišić & al. 1978 nom. prov. et illeg. (Art. 3b)

Diagnostic species: *Agrostis capillaris*, *Cynosurus cristatus*.

Distribution: Serbia.

Ass. *Potentillo albae-Festucetum rubrae* Blažková 1979

Diagnostic species: *Avenula pubescens*, *Campanula patula*, *Campanula rotundifolia* agg. (*C. gentilis*, *C. moravica*, *C. rotundifolia*), *Erophila verna*, *Knautia arvensis* agg. (*K. arvensis*, *K. kitaibelii*), *Leontodon hispidus*, *Leucanthemum vulgare* agg. (*L. ircutianum*, *L. vulgare*), *Peucedanum oreoselinum*, *Potentilla alba*, *Ranunculus bulbosus*, *Rumex thyrsoiflorus*, *Saxifraga granulata*, *Thlaspi caerulescens*, *Trifolium dubium*, *T. pratense*, *Trisetum flavescens*.

Distribution: Czech Republic.

Variations: var. *Festuca pratensis* (Corresp. name: *Potentillo albae-Festucetum rubrae* subass. *festucetosum pratensis* Blažková 1979); var. *Thymus pulegioides* (Corresp. name: *Potentillo albae-Festucetum rubrae* subass. *thymetosum* Blažková 1979).

Ass. *Anthoxantho-Brometum erecti* Poldini 1980

Corresponding names: *Arrhenatheretum elatioris* subass. *brometosum erecti* Poldini 1989.

Pseudonyms: *Arrhenatheretum elatioris* Poldini 1985 non Scherrer 1925.

Distribution: Italy, Croatia, Slovenia.

Variations: Croatia: var. *Chrysopogoni gryllus*.

Ass. *Luzulo campestris-Brometum mollis* de Foucault 1980

Distribution: France.

Ass. *Festuco rubrae-Cynosuretum cristati* Petković 1981

Diagnostic species: *Festuca rubra* ssp. *fallax* (= *F. nigrescens*), *Cynosurus cristatus*, *Carum carvi*, *Bromus racemosus*, *Lathyrus pannonicus*, *Poa trivialis*.

Distribution: Serbia.

Variations: subass. *typicum*; subass. *knautietosum dinarici* Petković & Tatić 1987.

Ass. *Phelipaeo coeruleae-Arrhenatheretum elatioris* J.-M. & J. Gèhu 1982

Distribution: France.

Ass. *Sileno montani-Arrhenatheretum elatioris* J.-M. & J. Gèhu 1982

Distribution: France.

Ass. *Vicio sepium-Arrhenatheretum* O'Sullivan 1982

Diagnostic species: *Centaurea nigra*, *Heracleum sphondylium*, *Trisetum flavescens*, *Vicia sepium*.

Distribution: Ireland.

Ass. *Odontito serotini-Trifolietum pratensis* O. Bolòs & Masalles 1983

Distribution: Iberian Peninsula.

Variations: Spain: subass. *typicum* (Syn.: *Odontito serotini-Trifolietum pratensis* O. Bolòs & Masalles 1983 subass. *trifolietosum pratensis*); subass. *arrhenatheretosum elatioris* O. Bolòs & Masalles 1983.

Ass. *Ononido-Arrhenatheretum elatioris* (Tomažič & Horvatić 1941) Ilijanić & Šegulja (1978) 1983

Distribution: Croatia, Serbia, Slovenia.

Variations: Serbia: subass. *cirsietosum cani* Butorac 1989 nom. inval. (Art. 1); subass. *eryngietosum campestre* Butorac 1989 nom. inval. (Art. 1).

Ass. *Rhinantho mediterranei-Trisetetum flavescens* Vigo 1984

Synonyms: *Gentiano luteae-Trisetetum flavescens* Vigo 1984.

Remarks: According to Ninot & al. (2000) these associations are separate syntaxa, not synonyms.

Diagnostic species: *Crepis vesicaria* subsp. *taraxacifolia*, *Knautia nevadensis*, *Rhinanthus mediterraneus*.

Distribution: Iberian Peninsula.

Variations: Spain: subass. *typicum*; subass. *salvietosum pratensis* Vigo ex Vigo in Ninot & al. 2000 (Basionym: *Rhinantho mediterranei-Trisetetum flavescens* Vigo 1984 subass. *salvietosum pratensis* Vigo 1984 nom. inval.); subass. *trifolietosum campestre* Vigo ex Vigo in Ninot & al. 2000 (Basionym: *Rhinantho mediterranei-Trisetetum flavescens* Vigo 1984 subass. *trifolietosum campestre* Vigo 1984 nom. inval.).

Ass. *Calamagrostietum epigeii* Sapegin 1986 (Art. 31)

Homonyms: *Calamagrostietum epigei* Juraszek 1928 (pointed for Poland in *Epilobietea angustifolii* Tüxen & Preising 1950).

Distribution: Belarus.

Annex 1. Continuation.**Ass. *Centaureo nemoralis-Festucetum arundinaceae* Gruber 1986**

Diagnostic species: *Centaurea nemoralis* (*C. debauxii* agg.), *Gaudinia fragilis*, *Oenanthe pimpinelloides*, *Schedonorus arundinaceus* (= *Festuca arundinacea*).

Distribution: France.

Ass. *Gaudinio-Festucetum pratensis* Seliškar 1986 nom. nud.

Distribution: Slovenia.

Ass. *Heracleo lecoquii-Arrhenatheretum elatioris* de Foucault 1986

Distribution: France.

Ass. *Lino biennis-Brometum mollis* de Foucault 1986

Distribution: France.

Ass. *Oenanthe pimpinelloidis-Linetum biennis* de Foucault 1986

Diagnostic species: *Centaurea debauxii* agg., *Gaudinia fragilis*, *Linum bienne*, *Oenanthe pimpinelloides*, *Silene flos-cuculi*, *Trifolium patens*.

Distribution: France.

Ass. *Sieglingio-Festucetum rubrae* Jovanović-Dunjić & al. 1986

Diagnostic species: *Festuca rubra*, *Sieglingia decumbens*.

Distribution: Serbia.

Ass. *Narcisso-Arrhenatheretum elatioris* Kriczfa-lushij & Gendey 1987

Distribution: Ukraine.

Ass. *Heracleo sphondylii-Brometum mollis* de Foucault 1989

Distribution: Belgium, France.

Ass. *Hordeo secalini-Arrhenatheretum elatioris* Fri-leux & al. 1989

Distribution: France.

Ass. *Ononido-Alopecuretum pratensis* Butorac 1989 nom. inval. (Art. 1)

Distribution: Serbia.

Variations: subass. *ranunculetosum aceri* Butorac 1989 nom. inval. (Art. 1); subass. *ranunculetosum polyanthemii* Butorac 1989 nom. inval. (Art. 1).

Ass. *Orchido morionis-Saxifragetum granulatae* Gaume ex de Foucault 1989

Distribution: France (in *Brachypodio-Centaureion nemoralis*).

Ass. *Alopecuro pratensis-Arrhenatheretum elatioris* (Tüxen 1937) Julve 1993 nom. inval. (Art. 3b)

Distribution: France.

Ass. *Ranunculo bulbosi-Arrhenatheretum elatioris* Ellmauer in Mucina & al. 1993

Original name: *Ranunculo bulbosi-Arrhenatheretum* Ellmauer in Mucina & al. 1993 (*Arrhenatherum elatius*).

Synonyms: *Arrhenatheretum elatioris* Br.(-Bl.) 1915 p. p.; *Arrhenatheretum elatioris* Scherer 1925 non Braun (-Bl.) 1915 (Art. 31); *Arrhenatheretum elatioris* subass. *ranunculetosum bulbosi* Knapp 1954; *Agrostido-Festucetum* Stockhammer 1964 (Art. 31). According to Uhliarová & al. (2007) incl.: *Arrhenatheretum brometosum erecti* Oberdorfer 1936, *Arrhenatheretum ranunculetosum bulbosi* Knapp & Knapp 1954, *Arrhenatheretum salvietosum pratensis* Hundt 1958. According to Ellmauer & Mucina (1993) incl.: *Arrhenatheretum brometosum erecti* Oberdorfer 1936, *Arrhenatheretum ranunculetosum bulbosi* Knapp & Knapp 1954, *Arrhenatheretum salvietosum pratensis* Hundt 1958, *Arrhenatheretum mesodanubiale salvietosum* Stockhammer 1964 (Art. 3e; 34), *Arrhenatheretum mesodanubiale brometosum* Stockhammer 1964 (Art. 3e; 34).

Remarks: According to Pätzolt & Jansen (2004) *Ranunculo bulbosi-Arrhenatheretum elatioris* Ellmauer in Mucina & al. 1993 and *Arrhenatheretum elatioris* Br.(-Bl.) 1915 [Syntax. syn.: *Pastinaco sativae-Arrhenatheretum elatioris* Passarge 1964] are syntaxonomical synonyms. Vicherek & al. 2000, Hájková & al. 2007 and Uhliarová & al. 2007 accept these associations as different syntaxa.

Diagnostic species: *Anthoxanthum odoratum*, *Arrhenatherum elatius* (usually as subdominant), *Avenula pubescens*, *Briza media*, *Bromus erectus*, *Campanula patula*, *Carex caryophyllea*, *C. montana*, *Clinopodium vulgare*, *Coronilla varia*, *Daucus carota*, *Dianthus carthusianorum* agg., *Festuca rubra* agg., *Filipendula vulgaris*, *Leontodon hispidus*, *Leucanthemum vulgare* agg. (*L. ircutianum*, *L. vulgare*), *Lotus corniculatus*, *Lychnis viscaria*, *Pimpinella saxifraga*, *Plantago media*, *Ranunculus bulbosus*, *Salvia pratensis*, *Sanguisorba minor*, *Silene vulgaris*, *Tragopogon orientalis*, *Trifolium montanum*, *Trisetum flavescens*.

Distribution: Austria, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Serbia, Slovakia, Slovenia.

Variations: Germany: var. *typicum*; var. *Linum catharticum*; var. *Campanula rotundifolia*; Slovakia: var. *Daucus carota*; var. *Fragaria vesca*; var. *Steris viscaria*.

Annex 1. Continuation.**Ass. *Ranunculo repentis-Alopecuretum pratensis* (Eggler 1933) Ellmauer in Mucina & al. 1993**

Synonyms: *Alopecuretum* Eggler 1958 (Art. 31); *Lolium perennis-Alopecuretum* Dietl 1983 (Art. 5). According to Ellmauer & Mucina (1993) incl.: *Arrhenatheretum alopecuretosum* R. Tüxen 1937, *Alopecuretum holcetosum lanati* Eggler 1959, *Alopecuretum poetosum angustifoliae* Eggler 1959, *Ranunculetum caricetosum brizoidis* Stockhammer 1964 (Art. 3e), *Arrhenatheretum mesodanubiale alopecuretosum* Stockhammer 1964 (Art. 3e; 34); non *Alopecuretum pratensis* Regel 1925, *Alopecuretum pratensis* Steffen 1931 (Art. 31), *Agropyro-Alopecuretum* Moravec 1965.

Diagnostic species: *Alopecurus pratensis*, *Cardamine matthioli*, *C. pratensis*, *Carex hirta*, *Cerastium holsteoides*, *Festuca pratensis*, *Glechoma hederacea*, *Holcus lanatus*, *Lolium perenne*, *Lychnis flos-cuculi*, *Lysimachia nummularia*, *Myosotis palustris*, *Ranunculus repens*, *Rumex obtusifolius*, *Sanguisorba officinalis*.

Remarks: Dierschke (1997) refer this association to the plant community *Ranunculus repens-Alopecurus pratensis*.

Distribution: Austria, Bulgaria, Czech Republic, Germany, Hungary, Romania, Slovakia (in *Deschampsion*), Slovenia, Ukraine (in *Alopecurion pratensis*).

Variations: Austria: subass. *typicum* Ellmauer 1995; subass. *anthriscetosum* Ellmauer 1995; subass. *lychnietosum* Ellmauer 1995; Bulgaria: var. *typicum*, var. *Eryngium campestre*.

Ass. *Tanaceto vulgaris-Arrhenatheretum elatioris* Fischer ex Ellmauer in Mucina & al. 1993

Synonyms: *Tanaceto-Arrhenatheretum* Fischer 1985 (Art. 5). According to Ellmauer & Mucina (1993) incl.: *Arrhenatheretum tanacetetosum* Knapp 1946 (Art. 1), *Arrhenatheretum tanacetetosum* Knapp 1954, plant community *Arrhenatheretum elatius-Artemisia vulgaris* sensu Bornkamm 1974 (Art. 3c).

Remarks: Based on this association as *holotypus*, Rodríguez-Rojo & al. (2017) propose a new alliance within *Molinio-Arrhenatheretea* class – *Anthrisco sylvestris-Arrhenatherion elatioris* Rodríguez-Rojo & al. 2017, which is associated with the semi-ruderal vegetation of the classes *Artemisietea vulgaris* and *Epilobietea angustifolii* to some extent.

Diagnostic species: *Artemisia vulgaris*, *Cichorium intybus*, *Cirsium arvense*, *Convolvulus arvensis*, *Elymus repens*, *Linaria vulgaris*, *Melilotus albus*, *M. officinalis*, *Salvia nemorosa* (Pannonicum), *Silene latifolia* ssp. *alba*, *Tanacetum vulgare*.

Distribution: Austria, Bulgaria, France, Hungary.

Ass. *Centaureo carniolicae-Arrhenatheretum elatioris* (Oberdorfer 1964) Poldini & Oriolo 1994

Original name: *Centaurea dubiae-Arrhenatheretum elatioris* Oberdorfer 1964 (Art. 43)

Pseudonyms: *Arrhenatheretum elatioris* Pedrotti 1964 non Scherrer 1925; *Arrhenatheretum elatioris* Buffa & al. 1989 non Scherrer 1925.

Distribution: Italy, Slovenia.

Ass. *Malvo moschatae-Arrhenatheretum bulbosi* Tüxen & Oberdorfer 1958 corr. T.E. Díaz & F. Prieto 1994

Original name: *Malvo moschatae-Arrhenatheretum elatioris* Tüxen & Oberdorfer 1958 (Art. 43).

Synonyms: *Gaudinio fragilis-Festucetum pratensis* Br.-Bl. 1967.

Diagnostic species: *Crepis capillaris*, *Malva moschata*, *Rhinanthus angustifolius*.

Distribution: Iberian peninsula, France.

Variations: Spain: subass. *typicum* sensu Tx. & Oberd. 1958, Puente & Tascon 1981; subass. *Amthyllis dillenii* Tx. & Oberd. 1958; subass. *Avena sulcata* Tx. & Oberd. 1958; subass. *Centaurea seussana* Tx. & Oberd. 1958; subass. *Polygonum bistorta* Tx. & Oberd. 1958.

Ass. *Poo sylvicolae-Lolietum multiflori* Poldini & Oriolo 1994

Distribution: Italy.

Ass. *Malvo moschatae-Brometum mollis* (Baranger 1978) Julve 1994 nom. ined. (Art. 1)

Distribution: France (in *Brachypodio-Centaureion nemoralis*).

Ass. *Filipendulo vulgaris-Arrhenatheretum* Hundt & Hübl ex Ellmauer 1995

Synonyms: *Filipendulo vulgaris-Arrhenatheretum* Hundt & Hübl 1983.

Diagnostic species: *Brachypodium pinnatum*, *Bromopsis erecta*, *Bupthalmum salicifolium*, *Campanula patula*, *Centaurea jacea* s.l., *Filipendula vulgaris*, *Galium boreale*, *Primula veris*.

Distribution: Austria, Croatia, Hungary, Slovenia.

Ass. *Silao silae-Colchicetum autumnalis* de Foucault 1996 nom. inval. (Art. 3b)

Distribution: France.

Ass. *Brizetum mediae* Stepanovič 1999

Diagnostic species: *Briza media*.

Distribution: Belarus.

Variations: subass. *typicum*; subass. *agrostidetosum tenuis* sensu Stepanovich 2000; subass. *anthoxanthetosum odorati* sensu Stepanovich 2000; subass. *cyno-*

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suretosum cristati sensu Stepanovich 2000; subass. *festucetosum pratensis* sensu Stepanovich 2000; subass. *festucetosum rubrae* sensu Stepanovich 2000.

Ass. *Brometum mollis* Stepanovič 1999

Diagnostic species: *Bromus mollis*, *Cardaminopsis arenosa*.

Distribution: Belarus.

Variations: subass. *agrostidetosum tenuis* sensu Stepanovich 2000; subass. *cynosuretosum cristati* sensu Stepanovich 2000; subass. *dactylidetosum glomeratae* sensu Stepanovich 2000; subass. *festucetosum pratensis* sensu Stepanovich 2000; subass. *festucetosum rubrae* sensu Stepanovich 2000; subass. *poetosum pratensis* sensu Stepanovich 2000.

Ass. *Campanulo serratae-Agrostietum capillaris* Denisiuk & Korzeniak 1999

Distribution: Ukraine.

Ass. *Helictotrichonetum pubescentis* Stepanovič 1999

(Incl. *Avenastreto-Nardetum* Ružička 1955)

Diagnostic species: *Helictotrichon pubescens*.

Distribution: Belarus.

Variations: subass. *anthoxanthesetosum odorati* sensu Stepanovich 2000; subass. *brizetosum mediae* sensu Stepanovich 2000; subass. *festucetosum rubrae* sensu Stepanovich 2000.

Ass. *Centaureo fritschii-Arrhenatheretum* Trinajstić 2000

Distribution: Croatia.

Ass. *Cerastio holosteoides-Trisetetum flavescentis* Sanda & al. 2001

Pseudonyms: *Poo-Trisetetum flavescentis* auct. roman.

Distribution: Romania.

Ass. *Galio veri-Arrhenatheretum bulbosi* (Rivas Goday & Borja 1961) Rivas-Martínez & al. 2001

Synonyms: *Galio veri-Arrhenatheretum gudaricum* Rivas Goday & Borja 1961 nom. illeg. (Art. 34a; 39).

Distribution: Iberian Peninsula.

Variations: Spain: subass. *anthoxanthesetosum odorati* (O. Bolòs 1967) Bolòs in Ninot & al. 2000 [Syn.: *Galio veri-Arrhenatheretum gudaricum* Rivas Goday & Borja 1961 subass. *phleo-anthoxanthesetosum* O. Bolòs 1967 nom. illeg. (Art. 34c)].

Ass. *Lilio bulbiferi-Arrhenatheretum elatioris* Ružičkova 2002

Diagnostic species: *Allium oleraceum*, *Anthyllis vulneraria*, *Aquilegia vulgaris*, *Arrhenatherum elatioris*, *Bromus monocladus*, *Carlina acaulis*, *Campanula glomerata* agg., *Campanula serrata*, *Colchicum autumnale*, *Crepis alpestris*, *Dianthus carthusianorum* agg., *Gentiana cruciata*, *Jacea phrygia* agg., *Lilium bulbiferum*, *Plantago media*, *Potentilla thuringiaca*, *Primula vulgaris*, *Rhinanrhhus serotinus*, *Sanduisorba minor*, *Silene nemoralis*, *S. vulgaris*, *Tragopogon orientalis*, *Trifolium montanum*, *Trisetum flavescens*.

Distribution: Slovakia.

Distribution: Slovakia.

Ass. *Anthyllidi-Trifolietum montani* Matuszkiewicz 2002

Distribution: Ukraine.

Ass. *Anthyllidi-Trifolietum montani* sensu Snowarski 2002-2005

Diagnostic species: *Anthyllis vulneraria*; *Trifolium montanum*.

Distribution: Poland.

Ass. *Arrhenatheretum elatioris* Kojić & al. 2003 sensu lato (non Br.-Bl. 1925)

Distribution: Serbia.

Variations: subass. *arrhenatheretosum medioeuropaeum* Kojić & al. 2003 (=Ass. *Arrhenatheretum medioeuropaeum* Oberdorfer 1952); subass. *clematetosum integrifoliae* Kojić & al. 2003 (=Ass. *Arrhenatheretum medioeuropaeum* Oberdorfer 1952 subass. *clematetosum integrifoliae* M. Vučk. 1991); subass. *cisietosum cani* Kojić & al. 2003 [=Ass. *Ononido arvensis-Arrhenatheretum elatioris* (Horvatić 1956) Ilijan-Šegulja (1978) 1980 subass. *cisietosum cani* Butorac 1992]; subass. *eryngietosum campestre* Kojić & al. 2003 [=Ass. *Ononido arvensis-Arrhenatheretum elatioris* (Horvatić 1956) Ilijan-Šegulja (1978) 1980 subass. *eryngietosum campestre* Butorac 1992].

Ass. *Cynosuretum cristati* Kojić & al. 2003 sensu lato

Synonyms: *Bromo-Cynosuretum cristati* Horvatić 1930.

Distribution: Serbia.

Variations: subass. *brometosum racemosi* Kojić & al. 2003 (=Ass. *Bromo racemosi-Cynosuretum cristati* Horvatić 1930 subass. *brometosum racemosi* Horvatić 1930); subass. *rhinathetosum angustifoliae* Kojić & al. 2003 (=Ass. *Rhinantho angustifoli-Cynosuretum cristati* Blečić & Tatić 1960); subass. *trifolietosum patensi* Kojić & al. 2003 (=Ass. *Trifolio patensi-Cynosuretum cristati* Veljović 1967); subass. *festucetosum rubrae* Kojić & al. 2003 (=Ass. *Festuco rubrae-Cynosuretum cristati* Petk. 1981); subass. *knautietosum dinarici* Kojić & al. 2003 (=Ass. *Festuco rubrae-Cynosure-*

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tum cristati Petk. 1981 subass. *knautietosum dinarici* Petk. 1981); subass. *pancietosum serbicae* Kojić & al. 2003 (=Ass. *Festuco rubrae-Cynosuretum cristati* Petk. 1981 subass. *pancietosum serbicae* Gajić 1989); subass. *poetosum trivialis* Kojić & al. 2003 (=Ass. *Poo trivialis-Cynosuretum cristati* R. Jov. 1955); subass. *potentilletosum erectae* Kojić & al. 2003 (=Ass. *Potentillo erectae-Cynosuretum cristati* Matović 1986); subass. *agrostietosum albae* Kojić & al. 2003 (=Ass. *Cynosuro cristati-Agrostietum albae* Danon-Blaž. 1978); *knautietosum arvensis* Kojić & al. 2003; subass. *potentilletosum tormentillae* Kojić & al. 2003; subass. *genistetosum sagittalis* Kojić & al. 2003; subass. *agrostietosum vulgaris* Kojić & al. 2003.

Ass. *Armerio segoviensis-Arrhenatheretum bulbosi* Rodríguez-Rojo & Sánchez-Mata 2006

Distribution: Iberian Peninsula.

Ass. *Lathyro tuberosi-Arrhenatheretum elatioris* Royer in Royer & al. 2006

Distribution: France.

Ass. *Primulo veris-Festucetum rubrae* Misset, Royer & Didier in Royer & al. 2006

Diagnostic species: *Anacamptis morio*, *Colchicum autumnale*, *Primula veris*, *Vicia hirsuta*.

Distribution: France.

Ass. *Stellario gramineae-Festucetum rubrae* Royer & Didier in Royer & al. 2006

Distribution: France.

Ass. *Trisetum-Centaureetum macroptili* Zelnik 2007

Diagnostic species: *Centaurea macroptilon*, *Daucus carota*, *Trisetum flavescens*.

Distribution: Slovenia.

Variations: subass. *avenuletosum pubescentis* Zelnik 2007; subass. *potentilletosum repentis* Zelnik 2007.

Ass. *Anthoxantho odorati-Festucetum pratensis* Borhidi 2012

Distribution: Hungary.

Ass. *Primulo veris-Agrostietum capillaris* Uhliarová & Janišová 2014

Diagnostic species: *Anemone sylvestris*, *Ajuga reptans*, *Anacamptis morio*, *Anemone ranunculoides*, *Arabis hirsuta* agg., *Brachypodium pinnatum*, *Briaza media*, *Campanula cervicaria*, *C. rapunculoides*, *Carex montana*, *Centaurea scabiosa*, *Convallaria majalis*, *Cruciata glabra*, *Dactylorhiza sambucina*, *Dianthus carthusianorum* agg., *Euphrasia rostkoviana* agg., *Hieracium sabaudum*, *Iris graminea*, *Knautia arvensis*, *Laserpitium latifolium*, *Lathyrus niger*, *Lilium mar-*

tagon, *Mercurialis perennis*, *Orchis mascula*, *Phleum phleoides*, *Plantago media*, *Primula veris*, *Sedum sexangulare*, *Serratula tinctoria*, *Silene nutans*, *S. viscaria*, *S. vulgaris*, *Succisa pratensis*, *Thalictrum lucidum*, *Tragopogon pratensis* subsp. *orientalis*, *Trifolium rubens*, *Valeriana officinalis*, *Vicia cassubica*, *Viola odorata*.

Distribution: Ukraine.

Ass. *Rhinantho freynii-Trisetetum flavescens* Dakskobler & Seliškar 2015

Diagnostic species: *Helictotrichon pubescens*, *Medicago lupulina*, *Plantago media*, *Ranunculus bulbosus*, *Rhinanthus freynii*, *Trisetum flavescens*.

Distribution: Slovenia.

Variations: var. *Rhinanthus minor*; var. *Polygala comosa*.

Ass. *Betonico officinalis-Trifolietum pannonicum* Derzhypilsky & al. ex Zajac & al. 2016

Diagnostic species: *Campanula glomerata* agg., *Gladiolus imbricatus*, *Helianthemum canum*, *Ononis spinosa* subsp. *hircina*, *Peucedanum oreoselinum*, *Stellaria holostea*, *Trifolium alpestre*.

Distribution: Ukraine.

Ass. *Diantho deltoidis-Arrhenatheretum* (Máthé & Kovács 1960) Lengyel & al. 2016

Synonyms: *Festuco rubrae-Cynosuretum arrhenatheretosum* Máthé & Kovács 1960; *Anthyllido-Festucetum rubrae arrhenatheretosum* (Máthé & Kovács 1960) Borhidi 2012.

Distribution: Hungary.

Plant communities without rank related to alliance *Arrhenatherion*:**Plant community *Poa bulbosa* Markgraf 1932**

Distribution: Albania.

Plant community *Poa pratensis-Festuca rubra* sensu Fijałk. 1962

Synonyms: *Poo-Festucetum rubrae* Fijałk. 1962.

Diagnostic species: *Alopecurus pratensis*; *Festuca rubra* agg.; *Holcus lanatus*; *Poa pratensis*.

Distribution: Poland, Ukraine.

Plant community *Bromus hordeaceus* sensu Ellmauer & Mucina 1993; Ellmauer 1995

Distribution: Austria.

Plant community *Artemisia vulgaris-Arrhenatheretum* sensu Dierschke 1997

Synonyms: *Arrhenatheretum tanacetetosum* Knapp 1954; plant community *Arrhenatheretum elatius-Arte-*

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misia vulgaris sensu Bornkamm 1974; *Tanaceto-Artemisietum* Fischer 1985; Micina & al. 1993; plant community *Arrhenatherum elatius*; plant community *Urtica dioica-Arrhenatherum elatius* sensu DG (Stottele & Schmidt 1988).

Remarks: According to Pätzolt & Jansen (2004) plant community *Artemisia vulgaris-Arrhenatherum* sensu Dierschke 1997 is synonym pro parte of *Arrhenatheretum elatioris* Br.(-Bl.) 1915 [Syntax. syn.: *Pastinaco sativae-Arrhenatheretum elatioris* Passarge 1964]. At the same time, Pätzolt & Jansen (2004) do not consider the synonymy, mentioned by Dierschke (1997) – *Arrhenatheretum tanacetetosum* Knapp 1954; plant community *Arrhenatherum elatius-Artemisia vulgaris* sensu Bornkamm 1974; plant community *Urtica dioica-Arrhenatherum elatius* sensu DG (Stottele & Schmidt 1988).

Distribution: Germany.

Plant community *Ranunculus repens-Alopecurus pratensis* sensu Dierschke 1997

Synonyms: *Alopecurus pratensis* Steffen 1931; *Alopecuretum pratensis* (Regel 1925) Steffen 1931; Plant community *Alopecurus pratensis-Galium mollugo* sensu Hundt 1958; *Alopecurion pratensis* Passarge 1964; *Ranunculo repentis-Alopecuretum pratensis* Krisch 1974; *Ranunculo repentis-Alopecuretum pratensis* Micina & al. 1993; *Trifolio repentis-Alopecuretum pratensis* Dietl 1995.

Remarks: According to Pätzolt & Jansen (2004) plant community *Ranunculus repens-Alopecurus pratensis* sensu Dierschke 1997 is synonym pro parte of *Arrhenatheretum elatioris* Br.(-Bl.) 1915 [Syntax. syn.: *Pastinaco sativae-Arrhenatheretum elatioris* Passarge 1964].

Distribution: Germany, Poland (in *Alopecurion pratensis* Passarge 1964), Ukraine (in *Alopecurion pratensis*).

Plant community *Holcus lanatus* sensu Čarni 2001

Distribution: Slovenia.

Plant community *Poa pratensis-Dactylis glomerata* sensu Pavlov & al. 2006

Distribution: Bulgaria.

Plant community *Dactylis glomerata* sensu Milkina & Ljach 2008

Distribution: Ukraine.

Plant community *Festuca pratensis* sensu Milkina & Ljach 2008

Distribution: Ukraine.

Plant community *Gentiana lutea* sensu Milkina & Ljach 2008

Distribution: Ukraine.

Plant community *Holcus mollis* sensu Milkina & Ljach 2008

Synonyms: *Holcetum mollis* Mich. 1998 nom. prov. Distribution: Ukraine.

Plant community *Pteridium aquilinum* sensu Milkina & Ljach 2008

Distribution: Ukraine.

Plant community “*Arrhenatheretum elatioris* s. lat.” sensu Šilc & Čarni 2012

Distribution: Slovenia.

Plant community “*Arrhenatherion*” sensu Šilc & Čarni 2012

Distribution: Slovenia.

Plant community *Dactylis-Festuca pratensis* sensu Šilc & Čarni 2012

Distribution: Slovenia.

Plant community *Festuca rubra* sensu Šilc & Čarni 2012

Remarks: incl. *Festucetum rubrae* Seliškar 1986 nom. ined.

Distribution: Slovenia.

Plant community *Holcus lanatus* sensu Šilc & Čarni 2012

Distribution: Slovenia.

Plant community *Poa pratensis-Festuca rubra* sensu Klarzyńska & Kryszak 2015

Distribution: Poland.

Variations: var. *typicum*; var. *Alopecurus pratensis*; var. *Armeria maritima*; var. *Arrhenatheretum elatioris*; var. *Dactylis glomerata*; var. *Deschampsia caespitosa*; var. *Phalaris arundinacea*.

References: Cincović & Kojić (1955); Cincović (1956, 1957, 1959); Borza (1959); Blečić & Tatić (1960); Horvat (1962); Horvatić (1963); Moravec (1965); Medwečka-Kornaš & al. (1966); Kornaš & Medwečka-Kornaš (1967); Csűrös & al. (1969); Pilát (1969); Borza & Rašiu (1970); Csűrös (1970); Csűrös-Káptalan (1970); Trzcińska-Tacik & al. (1973); Horvat & al. (1974); Blečić & Lakušić (1976); Mišić & al. (1978); Blažková (1979); Speidel (1979); Izco & Guitian Rivera (1982); Jovanović-Dunjć; R. (1983); Balátová-Tuláčková (1985); Jovanović-Dunjć & al. (1986); Petković & Tatić (1987); Pop & al. (1988); Sýkora & al. (1988); Reif & al. (1989); Sanda & Popescu (1991);

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Rodwell (1992); Ellmauer & Mucina (1993); Oberdorfer (1993); Poldini & Oriolo (1994); Ellmauer (1995); Kovács (1995, 2004); Dierschke (1997; 1999); Krauholec & al. (1997); Sanda & al. (1998); Kojić & al. (1998, 2004, 2005); Stepanovich (1998); Gèhu (1999); Sapegin & Dainenko (1999); Ninot & al. (2000); Rodwell & al. (2000; 2007); Stančić (2000); Stepanovich (2000); Studer-Ehrensberger (2000); Vicherek & al. (2000); Bardat & al. (2001); Demeter & Veen (2001); Izco & al. (2001); Jansen & Pätzolt (2001); Jermacāne & Laiviņš (2001); Mihăilescu (2001); Rivas-Martínez & al. (2001); Soriano (2001); Dring & al. (2002); Konrád (2002); Pop & al. (2002); Ružičková (2002); Sendžikaitė (2002); Snowarski (2002-2005); Čarni (2003); Chytrý & Vicherek (2003); Gliga (2003); Gselman & al. (2003); Kaligarić & al. (2003); Bardat & al. (2004); Dengler & Wollert (2004); Drăgulescu (2004); Kojić & al. (2004); Kulcsár (2004); Pätzolt & Jansen (2004); Rodríguez-Rojo & Sánchez-Mata (2004, 2006); Sarbu & al. (2004); Tsukanova (2005); Lakušić & al. (2005); Makra (2005); Pavlov & al. (2006); Grzelak & Bocian (2006); Mosek & Miazga (2006; 2008); Rūsiņa (2006a; b); Šilc & Košir (2006); Trąba & al. (2006); Apostolova & al. (2007); Groza & al. (2007); Hájková (2007); Hájková & al. (2007); Janišová & al. (2010); Redžić (2007); Uhliarová & al. (2007); Zelnik (2007); Solomakha (2008); Gafta & Mountford (2008); Milkina & Ljach (2008); Pawlaczyk (2008); Sendžikaitė & al. (2008); Jarolímek & al. (2008b); Škodová & Janišová (2008); Stančić (2008a; b); Mounford & Akeroyd (2009); Kuzemko (2009b); Tzonev & al. (2009); Wolański & Trąba (2009); Becker & Becker (2010); Chocarro & al. (2010); Collaud (2011); Velev & al. (2011b); Lengyel & al. (2012); Petras Sackl & al. (2012); Šilc & Čarni (2012); Ačić & al. (2013a, b); Corriol (2013); Redžić & al. (2013); Tasenkevich & Kalinovich (2013); Willner & al. (2013a, b); Kosić & Britvec (2014); Loidi & al. (2014); Šilc & al. (2014); Vassilev & al. (2014); Dakskobler & Seliškar (2015); Fernez & Causse (2015); Klarzyńska & Kryszak (2015); Škodová & al. (2015); Ferrez & al. (2016); Lengyel & al. (2016); Zajac & al. (2016); Klimantová (2017); Rodríguez-Rojo & al. (2017).

Alliance CYNOSURION CRISTATI Tüxen 1947 nom. conserv. propos.

Original name: *Cynosurion cristati* Tüxen 1947 – nom. conserv. propos. versus *Lolium perennis* Felföldy 1942 nom. ambig. et rejic. propos.

Synonyms: *Polygonion avicularis* Aichinger 1933 nom. ambig. et rejic. propos. (Art. 36); *Lolium perennis* Felföldy 1942; *Potentillion anserinae* Tüxen 1947 p. p.; *Lolio-Potentillion anserinae* Tüxen 1947 p. p. (Art. 29c); *Polygonion avicularis* Br.-Bl. ex von Rochow 1951 p. p. (Art. 31); *Agrostideto-Festucion rubrae* Puşcaru & al. 1956 non Passarge 1969; *Achilleo-Cynosurion* (Tüxen 1947) Passarge 1969 nom. inval. (Art. 2d; 3m; 24a); *Alchemillo-Cynosurion* Passarge 1969; *Thymo-Cynosurion* Passarge 1969; *Eu-Ranunculo-Cynosurion* Passarge 1969; *Eu-Thymo-Cynosurion* Passarge 1969; *Ranunculo repentis-Cynosurion* Passarge 1969; *Cardamino pratensis-Cynosurion* Passarge 1969; *Bromo mollis-Cynosurion* Passarge 1969; *Sanguisorbo minoris-Cynosurion* Passarge 1969 *Lolio perennis-Plantaginion majoris* Sissingh 1969; *Phleo-Leontodontion* (Br.-Bl. & Berset 1957) Dietl 1972 p. p. (Art. 29); *Lolium perennis* Resmeriță & Pop 1972 (Art. 31); *Lolio-Cynosurion* Jurko 1974; *Alchemillo-Trifolion repentis* Passarge 1976; *Plantagini-Prunellion* Eliáš 1980; *Trifolium repentis-Lolium perennis* Dietl 1983; *Lino biennis-Gaudinion fragilis* de Foucault 1989; *Alchemillo xanthochlorae-Cynosurion cristati* (Passarge 1969) de Foucault 1989; *Rumici crispi-Cynosurion cristati* de Foucault 1989; *Ranunculo sardoi-Plantaginion intermediae* Julve 1993. According to Pätzolt & Jansen (2004) excl.: *Cichorium intybi* Tüxen ex Sissingh 1969. According to Ellmauer & Mucina (1993) incl.: *Lolio-Plantaginion* (Sissingh 1969) Passarge 1979; non *Plantaginion majoris* Br.-Bl. 1967 (Art. 8).

Corresponding names: *Gaudinio fragilis-Cynosurenion* Rivas Goday & Rivas-Martínez 1963; *Galio veri-Cynosurenion* Rivas Goday & Rivas-Martínez 1963; *Trifolio-Cynosuretalia* Sougnez & Limbourg 1963; *Cynosuro-Phleetalia* Passarge 1969; *Trifolio-Phleetalia* (Sougnez 1963) Passarge 1969; *Lolio-Cynosurenion* Jurko 1974; *Polygalo-Cynosurenion* Jurko 1974; *Trifolienalia* Oberdorfer 1990 p. p.

Remarks: 1) Rodwell & al. (2000) accept alliances *Cynosurion cristati* Tüxen 1947 and *Polygonion avicularis* Aichinger 1933 as different syntax; 2) Ferrez (2007) subordinate *Cynosurion* to *Trifolium repentis-Phleetalia pratensis* passarge 1969.

Diagnostic species: *Achillea millefolium*, *Agrostis capillaris*, *A. stolonifera*, *Ajuga reptans*, *Anthoxanthum odoratum*, *Atrichum undulatum*, *Bellis perennis*, *Briza media*, *Bromus commutatus*, *Capsella bursa-pastoris*, *Carex ovalis*, *Cichorium intybus*, *Cirsium arvense*, *Chamomilla suaveolens*, *Crepis capillaris*, *Cynosurus*

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cristatus, *Euphrasia kernerii*, *E. rostkoviana*, *Festuca nigrescens* ssp. *nigrescens*, *F. pratensis*, *F. rubra*, *Gentiana cruciata*, *G. lutea*, *Geranium molle*, *Gladiolus imbricatus*, *Holcus lanatus*, *Hordeum secalinum*, *Hypochoeris radicata*, *Leucanthemum vulgare*, *Leontodon autumnalis*, *L. saxatilis*, *Linum catharticum*, *Lolium perenne*, *Luzula campestris*, *Odontites rubra* (= *O. serotina*), *O. verna* (= *O. vulgaris*), *Omalotheca sylvatica*, *Phleum bertolonii*, *P. pratense*, *Plantago lanceolata*, *P. major*, *P. media*, *Poa annua*, *P. pratensis*, *Potentilla reptans*, *Primula veris*, *Prunella vulgaris*, *Ranunculus repens*, *R. sardous*, *Rhinanthus minor*, *R. rumelicus*, *Rumex crispus* ssp. *crispus*, *Stellaria graminea*, *Thymus pannonicus*, *T. pullegioides*, *Trifolium hybridum*, *T. pratense*, *T. repens*, *Veronica filiformis*, *V. serpyllifolia*.

References: Puşcaru & al. (1956); Medwečka-Kornaš & al. (1966); Gergely (1969); Csűrös & al. (1969); Jurko (1969a, b, 1974); Borza & Raţiu (1970); Resmeriţă (1970); de Foucault (1984); Mititelu & al. (1986, 1988); Ellenberg (1988); Coldea (1990); Sanda & Popescu (1991); Ivan & al. (1993); Oberdorfer (1993); Zuidhoff & al. (1995); Dierschke (1997, 1999); Kojić & al. (1997); Krahulec & al. (1997); Sanda & al. (1998); Rodwell & Dring (2000); Stepanovich (2000); Bardat & al. (2001); Mihăilescu (2001); Rivas-Martínez & al. (2001, 2002); Rodwell & al. (2002); Snowarski (2002-2005); Chytrý & Tichý (2003); Kabucis & al. (2003); Kaligarić & al. (2003); Burkart & al. (2004); Pázolt & Jansen (2004); Rodríguez-Rojo & Sánchez-Mata (2004); Sarbu & al. (2004); Meshinev & al. (2005); Rasomavicius & al. (2006); Ferrez (2007); Hájková & al. (2007); Janišová & al. (2007); Veen & al. (2007); Dajić Stevanović (2008); Mikhailovna (2008); Solomakha (2008); Jarolímek & al. (2008a); Škodová & Janišová (2008); Velev & al. (2010); Biondi & Blasi (2013); Biondi & al. (2014); Mucina & al. (2016).

Suballiances related to *Cynosurion*:**Suball. *Alchemillo xanthochlorae-Cynosurenion cristati* Passarge 1969**

Original name: *Alchemillo-Cynosurenion* Passarge 1969 nom. correct. (*Alchemillo-Cynosurion* pro suball. Art. 41b).

Synonyms: *Eu-Ranunculo-Cynosurenion* Passarge 1969 nom. correct. (*Eu-Ranunculo-Cynosurion* pro suball. Art. 41b) et nom. illeg. (Art. 34b); *Eu-Thymo-*

Cynosurenion Passarge 1969 nom. correct. (*Eu-Thymo-Cynosurion* pro suball. Art. 41b) et nom. illeg. (Art. 34b).

Corresponding names: *Alchemillo xanthochlorae-Cynosurion cristati* (Passarge 1969) de Foucault 1989; *Thymo-Cynosurion* Passarge 1969 p. p.; *Ranunculo-Cynosurion* Passarge 1969 p. p.; *Achilleo-Cynosurion* (Tüxen 1947) Passarge 1969 nom. inval. (Art. 2d; 3m; 24) p. p.

Suball. *Bromo mollis-Cynosurenion cristati* Passarge 1969

Original name: *Bromo-Cynosurenion* Passarge 1969 nom. correct. (*Bromo-Cynosurion* pro suball. Art. 41b).

Synonyms: *Lolio-Cynosurenion* Jurko 1974 (*Lolio-Cynosurion* pro suball. Art. 22; 41b).

Corresponding names: *Rumici crispi-Cynosurion cristati* de Foucault 1969 nom. inval. (Art. 2d; 3m; 24).

Suball. *Cardamino pratensis-Cynosurenion cristati* Passarge 1969

Original name: *Cardamino-Cynosurenion* Passarge 1969 nom. correct. (*Cardamino-Cynosurion* pro suball. Art. 41b).

Corresponding names: *Ranunculo-Cynosurion* Passarge 1969 p. p.

Suball. *Galio veri-Cynosurenion cristati* Rivas Goday & Rivas Mart. 1963

Synonyms: *Sanguisorbo minoris-Cynosurenion cristati* Passarge 1969 nom. illeg. (Art. 22).

Corresponding names: *Thymo-Cynosurion* Passarge 1969 p. p.

Suball. *Polygalo vulgaris-Cynosurenion cristati* Jurko 1974

Original name: *Polygalo-Cynosurenion* Jurko 1964 nom. correct. (*Polygalo-Cynosurion* pro suball. Art. 41b).

Corresponding names: *Achilleo-Cynosurion* (Tüxen 1947) Passarge 1969 nom. inval. (Art. 2d; 3m; 24) p. p.

Suball. *Agrostienion tenuis* Mirkin & Naumova 1986**Suball. *Cerastio arvensis-Cynosurenion cristati* Blasi & al. 2012**

Diagnostic species: *Armeria canescens*, *Cerastium arvense*, *Rhinanthus minor*, *Salvia pratensis*, *Tragopogon pratensis*.

Suball. *Trifolio resupinati-Cynosurenion cristati* Blasi & al. 2012

Diagnostic species: *Cerastium glomeratum*, *Convolvulus arvensis*, *Crepis neglecta*, *Salvia verbenaca*, *Trifolium micranthum*, *T. resupinatum*, *Verbena officinalis*.

Annex 1. Continuation.**Suball. *Danthonio decumbentis-Caricion insularis* Farris & al. 2013**

Diagnostic species: *Bellium bellidioides*, *Carex caryophyllea* subsp. *insularis*, *Danthonia decumbens*, *Luzula spicata* subsp. *italica*, *Mentha insularis*.

Remarks: Farris & al. (2013) described this suballiance and relate it provisionally to *Cynosurion cristati* alliance and *Arrhenatheretalia* Tüxen 1931 order. In Biondi & Blasi (2013) *Cynosurion* is subordinated to *Trifolio repentis-Phlegetalia pratensis* Passarge 1969 order.

References: Bardat & al. (2001); Farris & al. (2013); Ferrez (2007); Mikhailovna (2008); Blasi & al. (2012); Biondi & Blasi (2013).

Associations related to *Cynosurion*:**Ass. *Festucetum rubrae* Rübel 1912**

Distribution: Ukraine.

Variations: var. *typicum*; var. *Elytrigia repens*.

Ass. *Agrostietum vulgaris* Domin 1926

Synonyms: According to Kuzemko (2009b) incl.: *Galio veri-Agrostetum tenuis* Goncharenko 2003.

Diagnostic species: *Agrostis tenuis*.

Distribution: Ukraine.

Variations: subass. *typicum* with two variants – var. *typicum*, var. *Dianthus deltoides*; subass. *festucetosum pratensis* with two variants – var. *typicum*, var. *Koeleria delavignei*.

Ass. *Plantagini majoris-Lolietum perennis* Beger 1932 nom. inver. propos.

Original name: *Lolio perennis-Plantaginetum majoris* Beger 1932

Synonyms: *Lolietum perennis* Gams 1927 (Art. 7); *Lolio-Plantaginetum majoris* (Linkola 1921) Beger 1930; *Lolio perennis-Plantaginetum majoris* Beger 1930; *Lolio perennis-Polygonetum avicularis* Br.-Bl. 1930 p. p.; *Junco compressi-Plantaginetum* Br.-Bl. & Moor 1935 (Art. 2b); *Lolio perennis-Matricarietum suaveolentis* Tüxen 1937 p. p.; *Lolietum perennis* Felföldy 1942; *Lolium perenne* Sauberer 1953 (Art. 2b); *Festuco rupicolae-Lolietum perennis* Hadač & Rambousková 1980; According to Pätzolt & Jansen (2004) incl.: *Lolietum perennis* sensu Passarge 1964; plant community *Plantago major-Trifolium repens* sensu Dierschke 1997.

Diagnostic species: *Achillea millefolium*, *Bellis perennis*, *Capsella bursa-pastoris*, *Cichorium intybus*, *Dactylis glomerata*, *Elymus repens*, *Holcus lanatus*, *Hordeum murinum*, *Lolium perenne*, *Plantago lanceolata*, *P. major*, *Poa annua*, *P. pratensis* agg., *P. trivialis* ssp. *trivialis*, *Polygonum aviculare* agg., *Ranunculus repens*, *Stellaria media*, *Taraxacum* Sect. *Ruderalia*, *Trifolium repens*.

Distribution: Austria; Belarus, Bulgaria (in *Potentillion anserinae* Tüxen 1947), Czech Republic, France (in *Lolio perennis-Plantaginion majoris* G.Sissingh 1969), Germany, Hungary (in *Potentillion anserinae*), Montenegro (in *Polygonion avicularis*), Romania (in *Polygonion avicularis* Br.-Bl. 1930), Slovakia, Slovenia, Spain (as *Lolietum perennis* Gams 1927 in *Lolio perennis-Plantaginion majoris* Sissingh 1969); Ukraine.

Variations: Belarus: subass. *agrostidetosum tenuis* sensu Stepanovich 2000; subass. *bromopsidetosum inermis* sensu Stepanovich 2000; subass. *dactylidetosum glomeratae* sensu Stepanovich 2000; subass. *festucetosum pratensis* sensu Stepanovich 2000; subass. *trifolietosum pratensi* sensu Stepanovich 2000; subass. *trifolietosum repentis* sensu Stepanovich 2000; Bulgaria: subass. *cynodontosum* Tüxen 1950; Czech Republic: var. *Medicago lupulina*; var. *Poa annua*.

Ass. *Alchemillo hybridae-Poëtum supinae* Aichinger 1933 nom. inver. et nom. mut.

Original name: *Poa annua* ssp. *varia*-*Alchemilla hybrida* Aichinger 1933 (*Poa annua* ssp. *varia* = *Poa supina*).

Diagnostic species: *Carex ovalis*, *Plantago major*, *Poa supina*, *Sagina procumbens*, *Veronica serpyllifolia*.

Distribution: Czech Republic.

Ass. *Anthoxantho odorati-Agrostietum tenuis* Sillinger 1933

Original name: *Anthoxantho-Agrostidetum tenuis* Sillinger 1933 (*Anthoxanthum odoratum*; *Agrostis tenuis* = *A. capillaris*).

Synonyms: *Agrostetum vulgaris* Szafer & al. 1923; *Agrostio vulgaris-Gladioletum imbricati* Br.-Bl. 1930 nom. nud. (Art. 2b); *Gladiolo-Agrostietum* Br.-Bl. 1930; *Anthoxanthetum odorati* Kmoniček 1934; *Festuco-Cynosuretum* Tüxen in Büker 1942 p. p.; *Gladiolo imbricati-Agrostietum tenuis* (Br.-Bl. 1930) Pawłowski & Walas 1949; *Agrostetum-tenuis hungaricum* Soó 1957; *Gladioleto-Agrostidetum* Borza 1963 nom. nud. According to Kuzemko (2009b) incl.: *Galio-Anthoxanthetum* Tüxen & Böttcher 1969; *Centaurio-Nar-*

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cissetum angustifolii Kriczfalushij & Gendey 1987; *Polytricho-Narcissetum angustifolii* Kriczfalushij & Gendey 1987.

Diagnostic species: *Agrostis capillaris*, *Alchemilla gracilis*, *A. monticola*, *A. walasii*, *Anthoxanthum odoratum*, *Anthyllis vulneraria*, *Briza media*, *Campanula glomerata*, *Carex caryophyllea*, *Carlina acaulis*, *C. vulgaris s. lat.*, *Cerastium fontanum*, *Centaurea jacea*, *C. oxylepis*, *Cruciata glabra*, *Cynosurus cristatus*, *Dianthus armeria*, *Euphrasia rostkoviana*, *Gentiana cruciata*, *Gladiolus imbricatus*, *Hieracium bahinii*, *Leontodon autumnalis*, *L. hispidus*, *Leucanthemum vulgare* agg. (*L. ircutianum*, *L. vulgare*), *Linum catharticum*, *Lotus corniculatus*, *Ononis spinosa*, *Pimpinella saxifraga*, *Plantago media*, *Polygala major*, *P. vulgaris*, *Prunella laciniata*, *P. vulgaris*, *Ranunculus bulbosus*, *R. polyanthemos*, *Senecio jacobea*, *Sieglingia decumbens*, *Thymus pulegioides*, *Trifolium montanum*, *T. ochroleucon*, *T. pratense*, *T. repens*, *Viola saxatilis ssp. decorata*.

Distribution: Austria (in *Violion caninae* Schwickerath 1944, class *Calluno-Ulicetea* Br.-Bl. & Tx. 1943), Belarus (in *Arrhenatherion*), Bulgaria, Czech Republic, Hungary (also in *Nardo-Agrostion* Sillinger 1933), Latvia, Lithuania, Poland (also in *Arrhenatherion*), Romania (also in *Polygono bistortae-Trisetion*), Russia (Komi Republic), Slovakia (in *Arrhenatherion*), Ukraine (also in *Arrhenatherion*).

Variations: Belarus: subass. *typicum*; subass. *agrostidetosum tenuis* sensu Stepanovich 2000; subass. *brizetosum mediae* sensu Stepanovich 2000; subass. *cynosuretosum cristati* sensu Stepanovich 2000; subass. *festucetosum pratensis* sensu Stepanovich 2000; subass. *festucetosum rubrae* sensu Stepanovich 2000; subass. *nardetosum strictae* sensu Stepanovich 2000; subass. *plantaginetosum lanceolatae* sensu Stepanovich 2000; Czech Republic: var. *Brachypodium pinnatum*; var. *Crepis biennis*; Latvia: subass. *typicum* sensu Jurko 1969 with six variants – var. *typicum*, var. *Calamagrostis epigeios*, var. *Carex panicea*, var. *Melampyrum polonicum*, var. *Primula veris*, var. *Thymus ovatus*; subass. *holcetosum lanati* Rūsiņa 2006 with three variants – var. *typicum*, var. *Helictotrichon pubescens*, var. *Festuca pratensis*; subass. *nardetosum strictae* Jurko 1970; subass. prov. *trifolietosum arvensis* sensu Jermacāne & Laiviņš 2001; Slovakia: var. *Cardaminopsis halleri*; var. *Festuca rupicola*; var. *Primula elatior*; var. *Primula veris*; var. *Trifolium rubens*; Ukraine: subass. *typicum*; subass. *hieracietosum pilosellae* Kuzem-

ko 2009; subass. *calamagrostietosum epigei* Kuzemko 2009; subass. *nardetosum strictae* Kuzemko 2009 with two variants – var. *typicum*, var. *Astrantia major*.

Ass. Brizeto-Anthoxanthetum Kmoniček 1936

Synonyms: *Brizetum mediae* Stepanovič 1999.

Diagnostic species: *Anthoxanthum odoratum*, *Briza media*.

Distribution: Ukraine.

Variations: subass. *alchemilletosum gracilis* Kuzemko 2009; subass. *luzuletosum campestris* Kuzemko 2009 with two variants – var. *Festuca ovina*, var. *Polygonum bistorta*; subass. *trifolietosum rubentis* Kuzemko 2009.

Ass. Lolio perennis-Cynosuretum cristati Tüxen 1937

Original name: *Lolieto-Cynosuretum* (Br.-Bl. & de Leeuw 1937) Tüxen 1937 (*Lolium perenne*; *Cynosurus cristatus*).

Synonyms: *Cynosuretum cristati* Beger 1922 p. p. (Art. 7); pastures *Lolium-Cynosurus* sensu Br.-Bl. & De Leeuw 1936 (Art. 3c); *Lolio-Cynosuretum* Br.-Bl. & De Leeuw 1936; *Cynosurololietum* Br.-Bl. & De Leeuw 1936 nom. invers.; *Festuco commutatae-Cynosuretum* Tüxen 1940 (Art. 7); *Festuco-Cynosuretum* Tüxen in Bükler 1941, 1942; *Festuco-Cynosuretum cristati* Tüxen in Bükler 1942 p. p.; *Lolietum perennis* Safta 1943; *Galio veri-Trifolietum repentis* Sougnez 1957 p. max. p.; *Lolio-Poetum pratensis* Kutschera 1961; *Luzulo-Cynosuretum cristati* Meisel 1961 p. p.; *Crepidocynosuretum* Knapp 1962; *Lolio-Cynosuretum mesodanubiale* Stockhammer 1964 (Art. 34); *Luzulo-Cynosuretum cristati* Meisel 1966; *Festuco commutatae-Cynosuretum* Tüxen ex Bükler 1942; *Alchemillo-Cynosuretum* Th. Müller in Oberdorfer & al. 1967 (Art. 7); *Caro-Poetum pratensis* Blažková 1967; *Alchemillo-Cynosuretum* Th. Müller ex Passarge 1969; *Alopecuro-Cynosuretum* Passarge 1969; *Ranunculo-Cynosuretum* Passarge 1969 (Art. 7); *Carici-Cynosuretum* (Sougnez 1963) Passarge 1969 (Art. 7); *Medicagini-Cynosuretum* Passarge 1969; *Poo trivialis-Rumicetum obtusifolii* Hülbusch 1969 p. p.; *Phleo-Leontodontetum* Br.-Bl. & Bers. in Bers. 1969 p. p.; *Chrysanthemum-Rumicetum thyrsoflori* Walter 1977 p. p.; *Galio-Trifolietum* Schaminée & al. 1996; *Agrostio tenuis-Trifolietum repentis* Passarge 1999. According to the internet site of FloraWeb (accessed 26.03.2009) incl.: *Hordeetum secalini* Krisch 1974; *Lolio-Cynosuretum* subass. *Hordeum secalinum*; plant community *Elymus repens-Hordeum secalinum*; plant community *Plantago coronopus*.

Annex 1. Continuation.

Remarks: 1) Krahulec & al. (1997) accept *Lolio perennis-Cynosuretum cristati* Tüxen 1937 and *Caro-Poëtum pratensis* Blažková 1973 as separate syntaxa; 2) Oberdorfer (1993) and Kuzemko (2009b) accept *Lolio perennis-Cynosuretum cristati* Tüxen 1937 and *Festuco-Cynosuretum* Tüxen in Bükler 1942 as separate syntaxa; 3) Ellmauer & Mucina (1993) accept *Cynosuro-Lolietum* Br.-Bl. & De Leeuw 1936 nom. invers. and *Festuco commutatae-Cynosuretum* Tüxen ex Bükler 1942 as separate syntaxa.

Homonyms: *Lolio-Cynosuretum* Bükler 1941.

Diagnostic species: *Achillea millefolium* agg., *Agrostis capillaris*, *Astrantia major*, *Bellis perennis*, *Campanula scheuchzeri*, *Carlina acaulis*, *Carex flacca*, *C. hirta*, *Carum carvi*, *Cerastium holosteoides*, *Cirsium arvense*, *Cynosurus cristatus*, *Dactylis glomerata*, *Elymus repens*, *Euphrasia rostkoviana*, *Festuca pratensis*, *F. rubra* agg., *Genista germanica*, *Holcus lanatus*, *Leontodon autumnalis*, *L. hispidus*, *Linum catharticum*, *Lolium perenne*, *Luzula campestris*, *Plantago lanceolata*, *P. major*, *P. media*, *Pimpinella saxifraga*, *Poa pratensis* agg., *Polygala amara*, *Potentilla anserina*, *P. erecta*, *Ranunculus acris*, *R. sardous*, *Taraxacum* Sect. *Ruderalia*, *Thymus pulegioides*, *Trifolium pratense*, *T. repens*, *Veronica filiformis*.

Distribution: Albania, Austria, Belarus, Belgium, Croatia, Czech Republic, France, Germany, Hungary, Ireland, Italy, Lithuania, Netherlands, Poland, Romania, Serbia, Slovakia, Slovenia, Ukraine, United Kingdom.

Variations: Belarus: subass. *agrostidetosum tenuis* sensu Stepanovich 2000; subass. *anthoxanthesetosum odorati* sensu Stepanovich 2000; subass. *brizetosum mediae* sensu Stepanovich 2000; subass. *deschampsietosum cespitosae* sensu Stepanovich 2000; subass. *festucetosum pratensis* sensu Stepanovich 2000; subass. *festucetosum rubrae* sensu Stepanovich 2000; subass. *trifolietosum repentis* sensu Stepanovich 2000; Czech Republic: var. *Poa trivialis*; var. *Plantago lanceolata*; France: subass. *typicum*; subass. *ranunculetosum bulbosi* Sougnez 1951; subass. *achilletosum millefolii* Trivaudei in Ferrez 2007; subass. *alopecuretosum pratensis* Trivaudei in Ferrez 2007; Germany: subass. *luzuletosum campestris* with three variants – var. *Lotus corniculatus*, var. *Ranunculus polyanthemos*, var. *Veronica arvensis*; Italy: subass. *alopecuretosum utriculati* Venanzoni 1992; fac. *Carex acutiformis*; Poland: subass. *typicum* with two variants – var. *typicum*, var. *Agrostis gigantea*; subass. *ranunculetosum* Grodzinska, Zarzycki 1967 (Syn.: *Lolio-Cynosuretum ranuncu-*

letosum Tüxen & Preising 1951 p. p.); subass. *anthoxanthesetosum odoratae* sensu Trăba & al. 2008; subass. *dactylietosum glomeratae* sensu Trăba & al. 2008; subass. *festucetosum pratense* sensu Trăba & al. 2008; subass. *trifolietosum repentis* sensu Trăba & al. 2008; subass. *dactylidetosum glomeratae* sensu Maćkowiak & al. 2016 with two variants – var. *typicum*, var. *Bromus horeaceus*; subass. *plantaginetosum majoris* sensu Maćkowiak & al. 2016 var. *typicum*; subass. *trifolietosum repenti* sensu Maćkowiak & al. 2016 with three variants – var. *typicum*, var. *Armeria maritima* ssp. *elongata*; var. *Poa pratensis*. Romania: subass. *centaureetosum induratae* Borza 1941; Slovakia: var. *Plantago major*; var. *Thymus pulegioides*; Ukraine: subass. *typicum*; subass. *poetosum pratensis* Kuzemko 2009; var. *Agrostis stolonifera*; var. *Astrantia major*; var. *Carex caespitosa*; var. *Trifolium dubium*; var. *typicum* (pointed as variants of *Festuco-Cynosuretum cristati* Tüxen 1942).

Ass. Loto uliginosi-Cynosuretum cristati Tüxen 1937

Diagnostic species: *Cardamine pratensis*, *Carex leporina*, *Juncus effusus*, *Lotus pedunculatus*, *Silene flos-cuculi*.

Distribution: France.

Ass. Agrostetum tenuis montanum Szafer & al. 1923; Issler 1933; 1941 nom. illeg. (Art. 34a)

Distribution: Romania.

Variations: subass. *festucetosum rubrae* Anghel & al. 1965; subass. *festucetosum rupicolae* Ciorcirlan 1968; subass. *trifolietosum pratensis* Păun & al. 1972; subass. *festucetum valesiaca* (Ardelean 1983) Sanda & Popescu 1991 (Corresp. name: *Agrostio-Festucetum valesiaca* Ardelean 1983); fac. *poosum trivialis*; fac. *rhinanthosum alectorolophi*; fac. *moliniotum coeruleae*; fac. *trifoliosum patens*.

Ass. Lolio-Cynosuretum Bükler 1941

Homonyms: *Lolio-Cynosuretum* Br.-Bl. & De Leeuw 1936.

Diagnostic species: *Bellis perennis*, *Lolium perenne*, *Prunella vulgaris*.

Distribution: Ukraine.

Variations: var. *typicum*; var. *Festuca rubra*; var. *Poa pratensis*.

Ass. Deschampsietum flexuosae Issler 1942

Synonyms: *Asplenio-Deschampsietum flexuosae* Balász 1941; *Festuceto rubrae-Deschampsietum flexuosae* Rațiu 1964.

Distribution: Romania.

Annex 1. Continuation.**Ass. *Pediculari campestris*-*Caricetum montanae* Soó 1945**

Synonyms: *Agrostis tenuis*-*Carex montana*-*Festuca rubra* Pop & al. 1962 nom. illeg. (Art. 34c); *Carex montana*-*Festuca rubra*-*Agrostis tenuis* Gergely 1964; Csűrös-Káptalan 1964 nom. illeg. (Art. 34c).

Distribution: Romania.

Ass. *Agrostio*-*Danthonietum provincialis* Soó 1947 (*Agrostis canina*)

Synonyms: *Agrostideto*-*Danthonietum* Soó 1947; *Agrostis tenuis*-*Danthonia privincialis* Bujorean & al. 1959.

Diagnostic species: *Agrostis canina*, *A. stolonifera*, *Danthonia provincialis* (= *D. alpina*).

Distribution: Romania.

Ass. *Poëto angustifoliae*-*Agrostidetum capillaris* Soó & Csűrös 1947

Synonyms: *Poo angustifoliae*-*Agrostietum tenuis* Soó & Csűrös 1947.

Diagnostic species: *Poa pratensis* var. *angustifolia*, *Agrostis capillaris*.

Distribution: Romania (also in *Arrhenatherion*).

Ass. *Festuco rubrae*-*Agrostetum capillaris* Horvat 1951

Synonyms: *Festuceto rubrae*-*Agrostidetum tenuis montanum* Csűrös & Resmeriță 1960 nom. illeg. (Art. 34a); *Festuca rubra*-*Agrostis tenuis* sensu Csűrös & Resmeriță 1960; *Echio-Rumicetum acetosellae* Soran 1962; *Agrostio-Callunetum vulgaris* Resmeriță & Csűrös 1963; *Agrostis tenuis*-*Festuca sulcata*-*Festuca pseudovina* Evd. Pușcaru & al. 1963 nom. illeg. (Art. 34c); *Festuco rubrae*-*Agrostietum capillaris* Csűrös-Káptalan 1964; *Agrostideto capillaris*-*Festucetum rupicolae* Csűrös-Káptalan (1962) 1964 nom. invers.; *Festuceto rubrae*-*Agrostidetum tenuis subxerophyllum* Gergely 1964 nom. illeg. (Art. 34a); *Agrostetum tenuis biharicum* Resmeriță 1965; 1970 nom. illeg. (Art. 34a); *Agrostetum tenuis montanum* apud Resmeriță 1970 nom. illeg. (Art. 34a); *Hypochoerio radicatae*-*Agrostietum tenuis* Pop & al. 1988 pro syn., nom. nud. (Art. 2a; 3a; Recomm. 46 f); *Rumici acetosellae*-*Agrostietum tenuis* Sanda & Popescu 1981.

Corresponding names: *Hypochoerio radicatae*-*Agrostietum tenuis* Pop & al. 1988 subass. *callunetosum* Pop & al. 1988 [Syn.: *Agrostetum tenuis biharicum* Resmeriță 1965 nom. illeg. (Art. 34a)].

Pseudonyms: *Festuca rubra*-*Agrostis tenuis* auct. plur. non Csűrös & Resmeriță 1960; *Festuco rubrae*-

Cynosuretum auct. roman.; *Festucetum rubrae* auct. roman.; *Agrostetum tenuis* auct. roman.

Remarks: Sanda & al. (1999) accept *Festuco rubrae*-*Agrostetum capillaris* Horvat 1951 and *Rumici acetosellae*-*Agrostietum tenuis* Sanda & Popescu 1981 (Syn.: *Echio-Rumicetum acetosellae* Soran 1962) as separate syntaxa. *Festuco*-*Agrostietum* Horvat 1962 nom. nud. is mentioned for Slovenia.

Diagnostic species: *Achillea distans*, *A. millefolium* ssp. *tanacetifolia*, *Alchemilla vulgaris*, *Agrostis capillaris*, *Anthyllis vulneraria*, *Antennaria dioica*, *Anthoxanthum odoratum*, *Arnica montana*, *Asperula cynanchica*, *Campanula patula*, *Carlina acaulis*, *Centaurea melanocalantha*, *Coronilla varia*, *Dianthus deltoides*, *Dorycnium herbaceum*, *Festuca rubra*, *F. rupicola*, *Filipendula vulgaris*, *Gentiana praecox*, *Helianthemum nummularium*, *Hieracium aurantiacum*, *Hypericum maculatum*, *H. perforatum*, *Koeleria gracilis*, *Luzula nemorosa*, *Medicago falcata*, *Moenchia mantica*, *Nardus stricta*, *Omalotheca sylvatica*, *Polygala comosa*, *Rhinanthus minor*, *Rumex acetosa*, *Salvia pratensis*, *Sanguisorba minor*, *Sieglingia decumbens*, *Stachys germanica*, *Stellaria graminea*, *Trifolium campestre*, *T. montanum*, *Veronica officinalis*, *Viola declinata*.

Distribution: Bulgaria; Croatia [according to Horvat (1962), Horvatić (1963) and Stančić (2000) in *Arrhenatherion*], Montenegro (in *Arrhenatherion*); Romania; Serbia (also in *Arrhenatherion*), Slovenia? (as *Festuco*-*Agrostietum* Horvat 1962 nom. nud.), Ukraine.

Variations: Romania: subass. *typicum* sensu Coldea 1991; subass. *coronilletosum variae* Jurko 1969; subass. *festucetosum rupicolae* Pázmány 1971; subass. *pteridietosum* Szabó 1971; subass. *agrostetosum tenuis* Coldea 1972; subass. *danthonietosum* (Pázmány 1971) Coste 1975 (Corresp. names: *Festuco rubrae*-*Agrostetum capillaris* Horvat 1951 fac. *danthoniosum provincialis*); subass. *deschampsietosum flexuosae* Rațiu & Gergely 1976; subass. *arnicetosum montanae* Rațiu & Gergely 1976; subass. *nardetosum strictae* Pop 1976 [Syn.: *Nardetum strictae alpinum* Borza 1934 nom. illeg. (Art. 34a) p. p.; *Nardetum strictae alpinum* Ghișa 1940 nom. illeg. (Art. 34a) p. p.; *Nardetum strictae alpinum* Csűrös 1955 nom. illeg. (Art. 34a) p. p.; *Nardetum strictae alpinum* Pușcaru & al. 1956 nom. illeg. (Art. 34a); *Nardetum alpigenum austro-carpaticum* Borza 1959 nom. illeg. (Art. 34a); *Nardetum strictae subalpinum* Buia & al. 1962 nom. illeg. (Art. 34a); *Nardetum strictae alpinum* Buia & al. 1962 nom. illeg.

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(Art. 34a); *Nardetum strictae alpinum* Buia 1963 nom. illeg. (Art. 34a) p. p.; *Nardetum strictae montanum* Resmeriță & Csűrös 1963 nom. illeg. (Art. 34a); *Viola declinatae* – *Nardetum strictae* Simon 1966; *Agrosteto-Festucetum rubrae montanum nardosum* Resmeriță & Csűrös 1966 nom. illeg. (Art. 34a); *Nardetum strictae alpinum* Beldie 1967 nom. illeg. (Art. 34a) p. p.; *Nardo-Vaccinietum* Resmeriță 1970; *Nardo-Festucetum tenuifoliae* Buiculescu 1971; *Festuco rubrae-Agrostetum capillaris* Horvat 1951 var. *Nardus stricta* Danciu 1974; *Hieracio polosellae-Nardetum strictae* Pop & al. 1988 pro syn.; nom. nud. (Art. 2b; 3a; Recomm. 46f)]; subass. *genistosum sagittalis* Coldea 1991 (Corresp. names: *Festuceto-Genistetum sagittalis* Csűrös & Resmeriță 1960 p. p.; *Festuca rubra-Genistella sagittalis* Gergely 1969 non Issler 1942); subass. *caricetosum montanae* Pop & al. 2000; subass. *avenuletosum praeustae* Bărbos 2006; var. *typicum*; var. *Poa pratensis*; var. *Ranunculus acris*; fac. *alchemillosum mollis*; fac. *genistosum sagittalis*; fac. *onobrychosum viciifoliae*; fac. *rhinanthosum majori* Ciucă 1963; fac. *pteridiosum aquilini* sensu Raclaru & Zanoschi 1968 (Syn.: *Festuco rubrae-Agrostetum capillaris* Horvat 1951 *pteridiosum* sensu Pop 1976); fac. *agrostiosum tenuis*.

Remarks: Within *Agrostidetum capillaris-Festucetum rupicolae* Csűrös-Káptalan (1962) 1964, mentioned as synonym, three subassociations are pointed: subass. *coronilletosum variae* Jurko 1967; subass. *pteridetosum* Szabó 1971; subass. *caricetosum montanae* Pop & al. 2002 (Syn.: *Carex montana-Festuca rubra* sensu Pop & al. 2002).

Ass. Centaureo nigrae-Cynosuretum cristati Br.-Bl. & Tüxen 1952

Synonyms: Plant community *Cynosurus cristatus-centaurea nigra* sensu Rodwell & al. 2000.

Diagnostic species: *Agrostis capillaris*, *Centaurea nigra* agg., *Hypochaeris radicata*, *Lotus corniculatus*.

Distribution: France, Ireland, United Kingdom.

Ass. Agrostio capillaris-Poetum subcaeruleae Tüxen 1955

Distribution: France.

Ass. Brizeto-Anthoxantheum Kmoníček 1936

Distribution: Ukraine.

Ass. Campanulo abietinae-Festucetum nigricantis Anghel & al. 1956

Distribution: Romania.

Ass. Phleo-Leontodontetum Br.-Bl. & Berset 1956

Distribution: Switzerland.

Ass. Plantagini lanceolatae-Festucetum rubrae Sca-moni 1956

Distribution: Ukraine.

Variations: var. *typicum*; var. *Elytrigia repens*.

Ass. Agrostio castellanae-Cynosuretum cristati Teles 1957

Synonyms: *Bromo commutati-Cynosuretum cristati* Teles (1963) 1966 (Art. 22; 29); *Bromo commutati-Cynosuretum cristati* Teles 1970 (Art. 43); *Bromo racemosi-Cynosuretum cristati* Teles 1970.

Remarks: According to Rodríguez-Rojo & al. (2014) incl.: *Festuco amplexae-Cynosuretum cristati* Rivas-Martínez ex Fuente 1986.

Distribution: Iberian Peninsula.

Ass. Alopecureto pratensis-Festucetum pseudovinae Juhász-Nagy 1957

Original name: *Alopecureto-Festucetum pseudovinae* Juhász-Nagy 1957.

Synonyms: *Festucetum pseudovino-rupicolae* Řehořek 1971 (Art. 2b; 3b).

Diagnostic species: *Alopecurus pratensis*, *Capsella bursa-pastoris*, *Dianthus armeria*, *Erophila verna* agg., *Eryngium planum*, *Festuca pseudovina*, *Myosotis stricta*, *Poa bulbosa*, *Potentilla argentea* agg., *Veronica arvensis*.

Distribution: Hungary, Slovakia.

Ass. Galio veri-Trifolietum repentis Sougnez 1957

Remarks: According to Zuidhoff & al. (1995) *Galio-Trifolietum* Sougnez 1957 and *Lolio-Cynosuretum* Tüxen 1937 are separate syntaxa, meanwhile Pázolt & Jansen (2004) accept these as "Syntax. Syn. p. max p."

Diagnostic species: *Galium verum*, *Medicago lupulina*, *Pimpinella saxifraga*, *Plantago media*, *Primula veris*.

Distribution: Belgium (also in *Arrhenatherion*), France (also in *Arrhenatherion*), Germany, Netherlands, Switzerland, United Kingdom.

Variations: Belgium: subass. *typicum*; France: subass. *typicum*.

Ass. Junco acutiflori-Cynosuretum cristati Sougnez 1957

Distribution: Belgium, France.

Ass. Trifolio-Festucetum rubrae Oberdorfer 1957

Synonyms: *Festucetum rubrae semenicense* Borza 1946 nom. illeg. (Art. 34a); *Festucetum rubrae fallax* Pușcaru & al. 1956; *Festuceto-Alchemilletum vulgare* Csűrös & Resmeriță 1960; *Festucetum rubrae montanum* Csűrös & Resmeriță 1960 nom. illeg. (Art. 34a);

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Festucetum rubrae subalpinum Csűrös & Resmeriță 1960 nom. illeg. (Art. 34a); *Festucetum rubrae montanum calcophilum* Csűrös & Resmeriță 1965 nom. illeg. (Art. 34a); *Festuceto-Alchemilletum vulgaris* Csűrös & Resmeriță 1965; *Festuca rubra-Origanum vulgare* Kovács & Moldovan 1965; *Festuca rubra-Iris graminea* Kovács & Moldovan 1965; *Festuca rubra-Thymus marschallianus* Kovács & Moldovan 1965; *Festuca rubra-Teucrium chamaedrys* Ghișa & al. 1965; *Festuca rubra-Picea excelsa* Resmeriță 1966; *Festucetum rubrae xeromezophilum* Resmeriță (1965) 1970 nom. illeg. (Art. 34a); *Alchemillo-Festucetum rubrae* Resmeriță 1972 nom. illeg. (Art. 31); *Festucetum rubrae* Resmeriță 1972; *Galio veri-Festucetum rubrae* Resmeriță 1980; *Potentillo (aureae-ternatae)-Festucetum rubrae* Resmeriță 1985.

Pseudonyms: *Festucetum rubrae submontanum* nom. illeg. (Art. 34a) auct. rom. non (Scam. 1955) Oberdorfer 1957.

Diagnostic species: see *Poo-Trisetetum flavescens* Knapp ex Oberdorfer 1957.

Remarks: 1) According to Oberdorfer (1993) and Hájková & al. (2007) *Trifolio-Festucetum rubrae* Oberdorfer 1957 and *Poo-Trisetetum flavescens* Knapp ex Oberdorfer 1957 are synonyms and subordinated to *Arrhenatherion*. Sanda & Popescu (1991) consider these as different syntaxa and refer them to different alliances – *Trifolio-Festucetum rubrae* to *Cynosurion*, but *Poo-Trisetetum flavescens* to *Polygono-Trisetion*. 2) Coldea (1987) describe *Scorzonero roseae-Festucetum nigricantis* (Pușcaru & al. 1956) Coldea 1987 and pointed the following synonyms: *Festucetum rubrae fallax* Pușcaru & al. 1956; *Nardo-Festucetum rubrae fallax* Pușcaru & al. 1959; *Festuca supina-Festuca rubra* Pușcaru & al. 1959; *Festucetum rubrae montanum* Csűrös & Resmeriță 1960 nom. illeg. (Art. 34a); *Festucetum rubrae subalpinum silicicolum* Csűrös & Resmeriță 1960 nom. illeg. (Art. 34a); *Festuco-Nardetum strictae montanum* Csűrös & Resmeriță 1960 nom. illeg. (Art. 34a); *Festuco-Alchemilletum vulgaris* Csűrös & Resmeriță 1960. Three of the synonyms (*Festucetum rubrae fallax* Pușcaru & al. 1956; *Festucetum rubrae montanum* Csűrös & Resmeriță 1960; *Festuco-Nardetum strictae montanum* Csűrös & Resmeriță 1960) are mentioned also as synonyms (Sanda & Popescu 1991) of *Trifolio-Festucetum rubrae* Oberdorfer 1957. Thus *Scorzonero roseae-Festucetum nigricantis* (Pușcaru & al. 1956) Coldea 1987 and *Tri-*

folio-Festucetum rubrae Oberdorfer 1957 should be considered as synonyms. Such consideration is not followed by many authors (Coldea 1987, 1990; Pop & al. 1988, 2002; Ivan & al. 1993; Mihăilescu 2001; Niculescu 2004). Meanwhile, it is widespread the acceptance that *Scorzonero roseae-Festucetum nigricantis* (Pușcaru & al. 1956) Coldea 1987 is a separate syntaxon, subordinated to *Potentillo ternatae-Nardion strictae* Simon 1958, which is related to classes *Nardo-Callunetea* Preising 1949 (Syn.: *Calluno-Ulicetea* Br.-Bl. & Tüxen ex Klika & Hadač 1944) and *Juncetea trifidi* Hadač in Klika & Hadač 1944 (Syn.: *Caricetea curvulae* Br.-Bl. 1948); 3) Krahulec & al. (1997) accept *Trifolio-Festucetum rubrae* Oberdorfer 1957 and *Poo-Trisetetum flavescens* Knapp ex Oberdorfer 1957 as separate syntaxa but relate them to *Arrhenatherion*; 4) The synonym *Festucetum rubrae subalpinum silicicolum* Csűrös & Resmeriță 1960, pointed as such by Sanda & Popescu (1991), is considered as synonym, by Coldea (1987), of *Scorzonero roseae-Festucetum nigricantis* (Pușcaru & al. 1956) Coldea 1987. All this means that *Trifolio-Festucetum rubrae* Oberdorfer 1957 subass. *agrostidetosum* Pușcaru & al. 1956 and *Scorzonero roseae-Festucetum nigricantis* (Pușcaru & al. 1956) Coldea 1987 should be treated as corresponding names.

Distribution: Czech Republic (in *Arrhenatherion*); Germany, Romania, Ukraine (also in *Arrhenatherion* and *Festucion pratensis*).

Variations: Czech Republic: subass. *alopecuretosum* Neuhäusl 1972 (*Alopecurus pratensis*); subass. *carlinetosum* Neuhäusl 1972 (*Carlina acaulis*); Romania: subass. *agrostidetosum* Pușcaru & al. 1956 [Syn.: *Trifolio-Festucetum rubrae* Oberdorfer 1957 subass. *silicicolum* Csűrös & Resmeriță 1960; Corresp. names: *Trifolio-Festucetum rubrae* Oberdorfer 1957 fac. *agrostosum tenuis* Raclaru 1959; *Festucetum rubrae subalpinum silicicolum* Csűrös & Resmeriță 1960 nom. illeg. (Art. 34a); *Festucetum-Agrostetosum tenuis subalpinum* Resmeriță (1969) 1970 nom. illeg. (Art. 34a)]; subass. *alchemilletosum* Pușcaru & al. 1956; subass. *alopecuretosum* Pușcaru & al. 1956; subass. *deschampsietosum* Pușcaru & al. 1956; subass. *retezaticum* Csűrös & al. 1956; subass. *calcipolum* Csűrös & Resmeriță 1960; subass. *nardetosum* Buia & al. 1962 (Corresp. names: *Trifolio-Festucetum rubrae* Oberdorfer 1957 fac. *nardosum strictae* sensu Maloch 1932; Pop & Tretiu 1958; *Trifolio-Festucetum rubrae* Oberdorfer 1957

Annex 1. Continuation.

fac. *nardosum strictae* sensu Resmeriță 1963); subass. *supinosum* Buia & al. 1962; subass. *brizetosum mediae* Raclaru 1967; Roșca & al. 1969; subass. *festucetosum (rubrae)-cytisetosum nigricantis* Resmeriță 1970 nom. illeg. (Art. 34c); fac. *anthoxanthosum odoratae*; fac. *caricosum montanae*; fac. *cynosurosom cristati*; fac. *deschampsiosum flexuosae*; fac. *festucosum pictae*; fac. *festucosum pratensis*; fac. *genistosum*; fac. *narcisetosum*; fac. *polytrichiosum*; fac. *rhinanthosum glaberi*; fac. *poosum nemoralis* sensu (Pauca & al. 1960) Sanda & Popescu 1991 (Corresp. names: *Festuco rubrae-Poëtum nemoralis* Pauca & al. 1960; *Poa nemoralis+Festuca rubra* Pauca & al. 1960).

Ass. Bromo racemosi-Cynosuretum cristati Horvatić (1930) 1958

Remarks: for details see in *Arrhenatherion*.

Ass. Caro verticillati-Cynosuretum cristati Bellot & Casaseca ex Tüxen in Tüxen & Oberdorfer 1958

Synonyms: *Lolio-Cynosuretum* sensu Bellot & Casaseca 1956 non Br.-Bl. & De Leeuw 1936

Corresponding names: *Lolio-Cynosuretum lolietosum multiflori* Bellot & Casaseca 1959.

Distribution: Iberian Peninsula.

Ass. Lino angustifolii-Cynosuretum cristati Allorge ex Oberdorfer & Tüxen in Tüxen & Oberdorfer 1958

Synonyms: *Anthoxantum odoratum-Cynosurus cristatus* Allorge 1941 (Art. 2b); *Lino biennis-Cynosuretum cristati* Allorge ex Oberdorfer & Tüxen in Tüxen & Oberdorfer 1958 nom. mut. (Art. 45).

Diagnostic species: *Centaurea nigra* agg., *Crepis capillaris*, *Daucus carota*, *Gaudinia fragilis*, *Linum bienne*.

Distribution: France (also in *Arrhenatherion*), Iberian Peninsula.

Ass. Merendero pyrenaicae-Cynosuretum cristati Oberdorfer & Tüxen in Tüxen & Oberdorfer 1958

Diagnostic species: *Agrostis capillaris*, *Colchicum montanum*, *Helictochloa marginata*, *Thymus praecox*.

Distribution: Iberian Peninsula.

Variations: Spain: subass. *cynosuretosum cristati*; subass. *bistortetosum officinalis* Loidi & al. 2014.

Ass. Anthoxantho odorati-Festucetum pseudovinae Juhász-Nagy 1959

Distribution: Hungary.

Ass. Agrostideto-Nardetum strictae Resmeriță & Texter 1956; Pauca & al. 1960 (*Agrostis capillaris*)

Synonyms: *Agrostis tenuis-Nardus stricta* Bujorean & al. 1959.

Distribution: Romania.

Ass. Festuco rubrae-Poëtum nemoralis Pauca & al. 1960

Diagnostic species: *Festuca rubra*, *Poa nemoralis*.

Distribution: Romania.

Ass. Agrostideto tenuis-Festucetum rupicolae Pușcaru & al. 1962

Diagnostic species: *Agrostis capillaris*, *Briza media*, *Centaurea jacea*, *Cynosurus cristatus*, *Euphrasia rostkoviana*, *Festuca rupicola*, *Linum catharticum*, *Potentilla argentea*, *Trifolium campestre*.

Distribution: Romania.

Ass. Agrosti-Cynosuretum Resmeriță 1963 (*Agrostis capillaris*, *Cynosurus cristatus*)

Synonyms: *Agrostis tenuis+Cynosurus cristatus* Evd. Pușcaru & al. 1959; *Agrostideto-Cynosuretum cristati* Resmeriță 1963.

Distribution: Romania.

Ass. Prunello vulgaris-Ranunculetum repentis Winterhoff 1963

Original name: *Prunella vulgaris-Ranunculus repens* Winterhoff 1963.

Synonyms: *Plantagini-Juncetum macri* Oberdorfer 1957 nom. prov. (Art. 3b); *Prunello-Plantaginetum majoris* Faliński 1963 nom. prov. (Art. 3b); *Alchemillo-Prunelletum vulgaris* Faliński 1963 nom. prov. (Art. 3b); *Alchemillo-Prunelletum vulgaris* Passarge 1979 (Art. 3f).

Pseudonyms: *Juncetum tenuis* sensu auct. non Schwickerath 1944 nom. prov.

Diagnostic species: *Bellis perennis*, *Geranium pusillum*, *Juncus tenuis*, *Leontodon autumnalis*, *Lolium perenne*, *Plantago major*, *Poa annua*, *Potentilla anserina*, *Prunella vulgaris*, *Ranunculus repens*.

Distribution: Austria (in *Plantagini-Prunellion* Eliáš 1980), Czech Republic, Poland, Slovakia (in *Plantagini-Prunellion* Eliáš 1980).

Ass. Agrostis tenuis-Festuca pseudovina Pop & al. 1964; Csűrös-Káptalan 1964

Distribution: Romania.

Ass. Agrostis tenuis-Lolium perenne Csűrös-Káptalan 1964

Distribution: Romania.

Ass. Trifolio repenti-Lolietum perennis Krippelová 1967; Resmeriță & Pop 1967

Synonyms: *Lolio-Trifolietum repentis* Resmeriță & al. 1967.

Corresponding names: *Lolieto-Cynosuretum trifoliosum repentis* Resmeriță & Csűrös 1966.

Annex 1. Continuation.

Diagnostic species: *Achillea setacea*, *Artemisia austriaca*, *Carduus acanthoides*, *Erodium cicutarium*, *Euphorbia cyparissias*, *Festuca pseudovina*, *Inula britannica*, *Lolium perenne*, *Lotus corniculatus*, *Poa bulbosa*, *Potentilla argentea*, *Thymus auctus*, *Trifolium repens*.

Remarks: According to Jarolimek & al. (2008b) this association is synonym of *Lolietum perennis* Gams 1927 (Syn.: *Plantagini majoris-Lolietum perennis* Berger 1932).

Distribution: Hungary, Romania (also in *Agropyro-Rumicion crispus* Nordh. 1940), Serbia, Slovakia (by the synonym *Lolietum perennis* Gams 1927), Ukraine.

Ass. *Alchemillo monticolae-Cynosuretum cristati* Müller & Görs 1968

Distribution: Belgium, France.

Ass. *Lolio-Trifolietum subterranei* Bruno & Covarelli 1968

Distribution: Italy.

Ass. *Campanulo subromboidalis-Cynosuretum cristati* Nègre 1969

Remarks: According to Rodríguez-Rojo & al. (2014) incl.: *Carici ornithopodae-Agrostietum capillaris* Villegas 1997.

Diagnostic species: *Centaurea jacea*, *Pimpinella saxifraga*, *Prunella grandiflora*, *Rhinanthus mediterraneus*.

Distribution: Iberian Peninsula.

Ass. *Medicagini lupulinae-Cynosuretum cristati* Pas-sarge 1969

Distribution: France.

Ass. *Agrosti-Genistelletum* Boşcaiu 1970 (*Genistella sagittalis*)

Synonyms: *Festuca rubra-Genista sagittalis* Anghel & al. 1956; *Festuca rubra+Genista sagittalis* Şerbănescu 1963.

Distribution: Romania.

Ass. *Anthemido nobilis-Cynosuretum cristati* Teles 1970

Distribution: Iberian Peninsula.

Ass. *Anthyllido vulnerariae-Festucetum rubrae* (Mátthe & Kovács 1960) Soó 1971

Original name: *Festuco rubrae-Cynosuretum* Tüxen 1940 subass. *festucetosum rubrae* Mátthe & Kovács 1960.

Synonyms: *Festuco rubrae-Cynosuretum* auct. hung. non Tüxen 1940; Soó 1957, 1962; *Festuco rubrae-Cynosuretum nardosum* Resmeriţă 1968.

Diagnostic species: *Agrostis capillaris*, *Anthoxanthum odoratum*, *Anthyllis vulneraria* agg., *Campanula patula*, *Carum carvi*, *Cynosurus cristatus*, *Festuca rubra*, *Luzula campestris*, *Trifolium pratense*.

Distribution: France, Hungary (also in *Arrhenatherion*), Romania.

Variations: subass. *festucetosum pratensis* Soó 1947; subass. *festucetosum pseudovinae* Soó 1964, Szabó & Gălan 1966 (Syn.: *Agrosteto-Festucetum sulcatae-valesiacae* Szabó 1971); subass. *agrostetosum tenuis* (Mátthe & Kovács 1960) Soó 1964 (Syn.: *Festuco-Agrostetum tenuis* Dihoru & al. 1970).

Ass. *Cirsio cani-Festucetum pratensis* Májovski & Růžičková 1971

Synonyms: *Deschampsietum caespitosae* Hayek ex Horvatič 1930 p. p.; *Festucetum pratensis* Soó 1938 (Art. 36) p. p.; *Agrostio stoloniferae-Deschampsietum caespitosae* Ujvárosi 1947.

Diagnostic species: *Alopecurus pratensis*, *Bromus commutatus*, *Carex muricata* agg., *C. praecox*, *C. hirta*, *Cirsium canum*, *Dactylis glomerata*, *Festuca pratensis*, *Holcus lanatus*, *Jacea pratensis*, *Leucanthemum vulgare*, *Lychnis flos-cuculi*, *Poa pratensis*, *P. trivialis*, *Potentilla reptans*, *Rumex acetosa*.

Distribution: Bulgaria, Hungary, Romania, Slovakia, Ukraine.

Ass. *Cynosuro cristati-Trifolietum repentis* Cortini Pedrotti & al. 1973

Distribution: Italy.

Ass. *Carici-Potentilletum reptantis* Gamisans 1976

Distribution: Italy.

Ass. *Ophioglosso vulgati-Nardetum strictae* Gamisans 1976

Distribution: Italy.

Ass. *Agrostio tenuis-Trifolietum repentis* Walther 1977

Distribution: Ukraine.

Ass. *Campanulo glomeratae-Cynosuretum cristati* Ubaldi 1978

Distribution: Italy.

Ass. *Crepidido capillaris-Festucetum rubrae* Hülbusch & Kiensat in Kienast 1978 nom. invers. propos.

Original name: *Festuco-Crepidetum capillaris* Hülbusch & Kiensat in Kienast 1978.

Synonyms: *Festuco rubrae-Crepidetum capillarim* Hülbusch & Kiensat in Kienast 1978; *Bellidetum perennis* Gutte 1984; *Trifolio repentis-Veronicetum filiformis* N. Müller 1988.

Annex 1. Continuation.

Diagnostic species: *Achillea millefolium* agg., *Agrostis capillaris*, *Cerastium holosteoides*, *Crepis capillaris*, *Festuca rubra* agg., *Hypochaeris radicata*, *Leontodon autumnalis*, *Lolium perenne*, *Plantago lanceolata*, *P. major* agg., *Poa pratensis* agg., *Ranunculus repens*, *Taraxacum* Sect. *Ruderalia*, *Trifolium dubium*, *T. repens*, *Veronica filiformis*, *V. serpyllifolia*.

Distribution: France, Germany.

Ass. *Festuco rubrae-Deschampsietum* Rațiu & Gergely 1978 (*Deschampsia caespitosa*)

Diagnostic species: *Deschampsia caespitosa*, *Festuca rubra*, *Juncus articulatus*, *J. effusus*, *Nardus stricta*, *Potentilla erecta*, *Veratrum album*.

Distribution: Romania.

Ass. *Galio veri-Festucetum rubrae* Resmeriță (1965) 1980

Synonyms: *Festucetum rubrae xero-mezofilum* Resmeriță 1965 nom. illeg. (Art. 34a).

Distribution: Romania.

Variations: subass. *cytisetosum nigricantis* Resmeriță 1970.

Ass. *Luzulo campestris-Cynosuretum cristati* (Meisel 1966) de Foucault 1981

Diagnostic species: *Agrostis capillaris*, *Centaurea jacea* agg., *Hypochaeris radicata*, *Lotus corniculatus*, *Luzula campestris*, *Pilosella officinarum*.

Distribution: Belgium, France (also in *Brachypodio-Centaureion nemoralis*).

Ass. *Eryngio campestris-Lolietum perennis* Wattez 1982

Distribution: France.

Ass. *Cynosuro cristati-Trifolietum repentis* O. Bolòs (1967) 1983

Synonyms: *Cynosuretum pradense* O. Bolòs 1967 nom. illeg. (Art. 34; 39); *Cynoserutum cristati catalaunicum* Vigo 1968 nom; illeg. (Art. 3b; 34).

Distribution: Iberian Peninsula.

Ass. *Trifolietum repentis* Shvergunova & al. 1984

Synonyms: *Leontodonti-Trifolietum repentis* (Steindorsson 1945) R. Tx. 1969; incl. *Junco compressi-Trifolietum repentis* Egger 1933, *Blysmo-Juncetum compressi* R. Tx. 1950.

Diagnostic species: *Trifolium repens*.

Distribution: Belarus.

Variations: subass. *agrostidetosum tenuis* sensu Stepanovich 2000; subass. *cynosuretosum cristati* sensu Stepanovich 2000; subass. *lolietosum perenni* sensu Stepanovich 2000; subass. *poetosum pratensis* sensu Stepanovich 2000.

Ass. *Agrostietum vinealis-tenuis* Shelyag & al. 1981 ex Shelyag & al. 1985

Diagnostic species: *Agrostis capillaris*, *A. vinealis*, *Koeleria delavignei*, *Potentilla argentea*.

Distribution: Ukraine.

Variations: var. *typicum*; var. *Betonica officinalis*; var. *Festuca pratensis*.

Ass. *Carici arenarie-Luzuletum campestris* de Foucault 1986

Distribution: France.

Ass. *Festuco amplae-Cynosuretum cristati* Rivas-Martínez ex Fuente 1986

Distribution: Iberian Peninsula.

Variations: Spain: var. *Juncus acutiflorus*; var. *Juncus squarrosus*.

Ass. *Centaureo-Narcissetum angustifolii* Kriczfalusij & Gendey 1987

Distribution: Ukraine.

Ass. *Polytricho-Narcissetum angustifolii* Kriczfalusij & Gendey 1987

Distribution: Ukraine.

Ass. *Trifolio repentis-Veronicetum filiformis* N. Müller 1988

Diagnostic species: *Veronica filiformis*.

Distribution: Austria.

Ass. *Achilleo collinae-Cynosuretum cristati* Biondi & al. 1989

Distribution: Italy.

Ass. *Caro carvi-Cynosuretum cristati* (Pfadenhauer 1969) de Foucault 1989

Distribution: France.

Ass. *Eryngio campestris-Lolietum perennis* Julve 1989 nom. ined. (Art. 1)

Distribution: France.

Ass. *Leontodono-Poetum pratensis* Anishchenko & L. Ishb. 1989

Variations: var. *typicum*; var. *Elytrigia repens*; var. *Festuca rubra*.

Distribution: Ukraine.

Ass. *Taraxaco-Festucetum pratensis* Anishchenko & L. Ishb. 1989

Distribution: Russia.

Ass. *Plantagini lanceolate-Cynosuretum cristati* Coquillard 1993

Distribution: France.

Ass. *Colchico lusitani-Cynosuretum cristati* Biondi & Ballelli 1995

Distribution: Italy.

Annex 1. Continuation.

Ass. *Gentiano luteae-Cynosuretum cristati* (de Foucault 1986) Gillet in Gallandat & al. 1995

Distribution: Belgium, France.

Ass. *Carici ornithopodae-Agrostietum capillaris* Villegas 1997

Distribution: Iberian Peninsula.

Ass. *Elytrigietum repentis* Stepanovič (1987) 1999

Synonyms: *Rumici crispi-Agropyretum repentis* Hejný in Hejný & al. 1979; incl. *Agropyro repentis-Aegopodietum podagrariae* R. Tx. 1937, *Agropyro-Alopecuretum* Moravec 1965.

Diagnostic species: *Elytrigia repens*.

Distribution: Belarus.

Variations: subass. *agrostidetosum tenuis* sensu Stepanovich 2000; subass. *aperetosum spica-ventii* sensu Stepanovich 2000; subass. *bromopsidetosum inermis* sensu Stepanovich 2000; subass. *dactylidetosum glomeratae* sensu Stepanovich 2000; subass. *festucetosum pratensis* sensu Stepanovich 2000; subass. *poetosum pratensis* sensu Stepanovich 2000; subass. *rumecetosum crispi* sensu Stepanovich 2000; subass. *trifolietosum pratensi* sensu Stepanovich 2000.

Ass. *Poetum pratensis* Stepanovič 1999

Remarks: for details see in *Festucion pratensis* Si-paylova & al. 1985.

Ass. *Pastinaco hirsutae-Festucetum nigrescentis* Dimitrov 2001

Diagnostic species: *Armeria rumelica*, *Pastinaca hirsuta*, *Silene roemerii*.

Distribution: Bulgaria.

Variations: subass. *typicum*; subass. *verbascetosum longifolii* Dimitrov 2001 with two variants – var. *Galium verum*, var. *Dianthus armeria*.

Ass. *Euphorbio cyparissiae-Festucetum rubrae* Didier & Royer in Royer & al. 2006

Distribution: France.

Ass. *Gentiano luteae-Cynosuretum cristati* de Foucault & Gillet in Ferrez 2007

Diagnostic species: *Agrostis capillaris*, *Alchemilla monticola*, *Cynosurus cristatus*, *Gentiana lutea*, *Lolium perenne*, *Sanguisorba minor*, *Stachys officinalis*.

Distribution: France.

Ass. *Centaureo calcitrapae-Lolietum perennis* Blasi & al. 2009

Diagnostic species: *Anthemis arvensis*, *Carduus nutans*, *Centaurea calcitrapa*, *Cerastium ligusticum*.

Distribution: Italy.

Ass. *Trifolio molinerii-Hordeetum bulbosi* Blasi & al. 2009

Diagnostic species: *Hordeum bulbosum*, *Mentha spicata*, *Trifolium incarnatum* ssp. *molineri*, *T. striatum*, *Vulpia ligustica*.

Distribution: Italy.

Ass. *Cirsio arvensis-Alopecuretum pratensis* Catteau in de Foucault & Catteau 2012

Distribution: France (in *Ranunculo-Cynosurion cristati* Passarge 1969).

Ass. *Festuco commutatae-Lolietum* nom. nud. sensu Šilc & Čarni 2012

Distribution: Slovenia.

Ass. *Loto pedunculati-Cynosuretum cristati* (Tüxen 1937) de Foucault & Julve in de Foucault & Catteau 2012

Distribution: France (in *Ranunculo-Cynosurion cristati* Passarge 1969).

Ass. *Loto alpini-Festucetum morisiana* Farris & al. 2013

Distribution: Italy.

Ass. *Phleo nodosi-Cynosuretum cristati* Rodríguez-Rojo & Fernández-González 2014

Diagnostic species: *Bellis perennis*, *Cynosurus cristatus*, *Phleum nodosum*, *Trifolium repens*.

Distribution: Iberian Peninsula.

Ass. *Colchico autumnalis-Festucetum rupicolae* Lengyel, Csiky, Dénes & Király in Lengyel & al. 2016

Distribution: Hungary.

Plant communities without rank related to *Cynosurion*:

Plant community *Cynosurus cristatus-Trifolium pratense* Buzo 1990

Distribution: Albania.

Plant community *Lolium perenne-Trifolium resupinatum* Buzo 1990

Distribution: Albania.

Plant community *Festuca ovina-Avenula pratensis* sensu Zuidhoff & al. 1995

Distribution: Belgium, France, Germany, Netherlands, Switzerland, United Kingdom (in *Mesobromion*).

Plant community *Plantago major-Trifolium repens* sensu Oberdorfer 1993

Corresponding names: *Lolio-Plantaginetum majoris* Sissingh 1969 non Beger 1930.

Distribution: Germany.

Annex 1. Continuation.**Plant community *Plantago major-Trifolium repens* sensu Dierschke 1997**

Corresponding names: *Lolio-Plantaginetum majoris* Sissingh 1969; *Lolietum perennis* Mucina & al. 1993.

Remarks: According to Pätzolt & Jansen (2004) plant community *Plantago major-Trifolium repens* sensu Dierschke 1997 is related to *Plantagini majoris-Lolietum perennis* Beger 1932.

Distribution: Germany.

Plant community *Alopecurus pratensis-Sanguisorba officinalis* sensu Rodwell & al. 2000

Distribution: United Kingdom.

Plant community *Lerchenfeldia flexuosa* sensu Pavlov & al. 2006

Distribution: Bulgaria.

Plant community *Lolium perenne* sensu Melegnik & al. 2008

Distribution: Ukraine.

Plant community *Poa pratensis* sensu Melegnik & al. 2008

Distribution: Ukraine.

References: Puşcaru & al. (1956); Csűrös & Resmeriță (1960); Horvatić (1963); Puşcaru–Soroceanu (1963); Medwečka-Kornaš & al. (1966); Pop (1968); Csűrös & al. (1969); Jurko (1969a, b; 1974); Gergely (1969); Csűrös (1970); Csűrös-Káptalan (1970); Marković (1970); Resmeriță (1970); Trzcińska-Tacik & al. (1973); Dihoru (1975); Blečić & Lakušić (1976); Speidel (1979); Balátová-Tuláčková (1985); Petković (1985); Mititelu & al. (1986, 1988); Mititelu & Dorca 1987; Coldea (1987, 1990); Pop & al. (1988); Sýkora & al. (1988); Reif & al. (1989); Sanda & Popescu (1991); Rodwell (1992); Venanzoni (1992); Ellmauer & Mucina (1993); Ivan & al. (1993); Ellmauer (1995); Kovács (1995, 2004); Zuidhoff & al. (1995); Dierschke (1997, 1999); Sanda & al. (1998, 1999); Kojić & al. (1998); Gèhu (1999); Jermacâne (1999); Ninot & al. (2000); Stančić (2000); Stepanovich (2000); Goncharenko (2001); Dimitrov (2001, 2004, 2015); Bardat & al. (2001); Demeter & Veen (2001); Miazga & Mosek (2001); Izco & al. (2001); Jansen & Pätzolt (2001); Jermacâne & Laiviņš (2001); Mihăilescu (2001); Rivas-Martínez & al. (2001); Soriano (2001); Dring & al. (2002); Pop & al. (2002); Snowarski (2002-2005); Chytrý & Tichý (2003); Coste & Arsene (2003); Gliuga (2003); Neblea & Chirițoiu (2003); Zamfirescu &

Zamfirescu (2003); Bardat & al. (2004); Drăgulescu (2004); Grigoriu & Alda (2004); Pätzolt & Jansen (2004); Rodríguez-Rojo & Sánchez-Mata (2004); Sarbu & al. (2004); Lakušić & al. (2005); Meshinev & al. (2005); Pavlov & al. (2006); Apostolova & Meshiunev (2006); Bărbos (2006); Grzelak & Bocian (2006); Mosek & Miazga (2006); Rūsiņa (2006a, b); Trăba & al. (2006); Astakhova (2007); Hájková & al. (2007); Groza & al. (2007); Janišová & al. (2007, 2010); Rodwell & al. (2007); Zaliberová & Škodová (2007); Mikhailovna (2008); Gafta & Mountford (2008); Milkina & Ljach (2008); Pawlaczek (2008); Sendžikaitė & al. (2008); Jarolínek & al. (2008b); Melegnik & al. (2008); Škodová & Janišová (2008); Sopotlieva (2008); Tomescu & al. (2008); Trăba & al. (2008); Blasi & al. (2009, 2012); FloraWeb (accessed 26.03.2009); Kalajnhu & al. (2009); Kuzemko (2009b); Mounford & Akeroyd (2009); Tzonev & al. (2009); Wolański & Trăba (2009); Becker & Becker (2010); Chocarro & al. (2010); Dúbravková & al. (2010); Collaud (2011); Velev & al. (2011a); Šilc & Čarni (2012); Ačić & al. (2013b); Farris & al. (2013); Kozyr (2013); Tasenkevich & Kalinovich (2013); Willner & al. (2013a, b); Loidi & al. (2014); Rodríguez-Rojo & Fernández-González (2014); Rodríguez-Rojo & al. (2014); Shushpannikova & Yamalov (2014); Vassilev & al. (2014); Fernez & Causse (2015); Škodová & al. (2015); Maćkowiak (2016); Zajac & al. (2016); Rodríguez-Rojo & al. (2017).

Alliance *POLYGONO BISTORTAE-TRISETION FLAVESCENTIS* Br.-Bl. & Tüxen ex Marschall 1947 nom. invers.

Original name: *Trisetum-Polygonum bistortae* Marschall 1947 (*Trisetum flavescens*; *Polygonum bistorta* = *Bistorta major*).

Synonyms: *Trisetum flavescens*-*Polygonum bistortae* Br.-Bl. & Tüxen 1943 nom. nud. (Art. 2; 8); *Trisetum flavescens*-*Polygonum bistortae* Br.-Bl. & Tüxen 1943 ex Marschall 1947; *Trisetum-Polygonum bistortae* Br.-Bl. 1949 ex 1950; *Rumici-Trisetion flavescens* Passarge 1969 (Art. 29c); *Phyteumato-Trisetion* (Passarge 1969) Ellmauer & Mucina in Mucina & al. 1993.

Corresponding names: *Campanulo-Trisetenion* Dierschke 1981 nom. inval. (Art. 2b; 5); *Phyteumato-Trisetenion* Passarge 1969; *Campanulo rhomboidalis-Trisetenion flavescens* Dierschke in Theurillat 1992; *Poo alpinae-Trisetetalia* Mucina & al. 1993.

Annex 1. Continuation.

Remarks: Mucina & al. (2016), excluded *Phyteumato-Trisetion* (Passarge 1969) Ellmauer & Mucina in Mucina & al. 1993 alliance from the synonymy and presented it as a separate syntaxon. The *Polygono bistortae-Trisetion* alliance is related to *Poo alpinae-Trisetetalia* Ellmauer & Mucina 1993 order.

Diagnostic species: *Agrostis capillaris*, *Alchemilla* spec. div., *Anemone nemorosa*, *Anthoxanthum odoratum*, *Anthriscus nitidus*, *Arnica montana*, *Astrantia major*, *Bistorta major*, *Campanula glomerata* agg., *Campanula gentilis*, *C. moravica*, *C. rhomboidalis*, *C. rotundifolia* aggr., *C. serrata*, *C. scheuchzeri*, *Cardaminopsis halleri*, *Carum carvi*, *Centaurea oxylepis*, *C. phrygia*, *C. phrygia* ssp. *carpatica*, *C. pseudophrygia*, *C. transalpina*, *Chaerophyllum hirsutum*, *C. villarsii*, *Cirsium erisithales*, *C. heterophyllum*, *Crepis aurea*, *C. conyzifolia*, *C. mollis*, *C. pyrenaica*, *C. succisifolia*, *Crocus albiflorus*, *C. discolor*, *C. heuffelianus*, *C. vernus*, *Cruciata glabra*, *Dactylis glomerata*, *Deschampsia caespitosa*, *Festuca diffusa*, *F. nigrescens*, *F. rubra* aggr., *Galium saxatile*, *Gentianella austriaca*, *Geranium phaeum*, *G. pratense*, *G. sylvaticum*, *Gladiolus imbricatus*, *Heraclium sphondilium*, *Hypericum maculatum*, *Knautia dipsacifolia*, *K. longifolia*, *K. maxima*, *Lilium bulbiferum*, *Lychnis flos-cuculi*, *Meum athamanticum*, *Muscari botryoides*, *Narcissus angustifolius*, *N. exsertus*, *N. radiiflorus* (= *N. poeticus* ssp. *radiiflorus*), *Noccaea caerule-scens* ssp. *caerule-scens* (= *Thlaspi caerule-scens*), *Phleum alpinum*, *P. rhaeticum*, *Phyteuma nigrum*, *P. orbiculare*, *P. ovatum*, *P. spicatum*, *P. tetramerum*, *Pimpinella major*, *Poa alpina*, *P. chaixii*, *Polygonum bistorta*, *Potentilla aurea*, *P. erecta*, *Primula elatior*, *Ranunculus carpaticus*, *R. polyanthemus* agg., *Rhinanthus alectorolophus*, *R. pulcher*, *R. rumelicus*, *Rumex alpestris*, *R. arifolius*, *Sanguisorba officinalis*, *Senecio subalpinus*, *Silene dioica*, *Stellaria graminea*, *Trisetum flavescens*, *Traunsteinera globosa*, *Trifolium pratense*, *Trollius europaeus*, *Veronica chamaedrys*, *Vicia sepium*, *Viola declinata*, *V. tricolor*.

References: Borza (1959); Moravec (1965); Jurko (1974); Dihoru (1975); Blažková (1985); Boşcaiu & Täuber (1985); Ellenberg (1988); Sanda & Popescu (1991); Oberdorfer (1993); Dierschke (1997, 1999); Krahulec & al. (1997); Sanda & al. (1999); Pop & al. (1988); de Foucault (1989); Mihăilescu (2001); Rivas-Martínez & al. (2001); Chytrý & Tichý (2003); Ružičková (2002); Snowarski (2002-2005); Burkart

& al. (2004); Tomescu & al. (2006); Apostolova & al. (2007); Hájková & al. (2007); Hegedüšová & Ružičková (2007); Solomakha (2008); Jarolímek & al. (2008a; b); Škodová & Janišová (2008); Biondi & Blasi (2013); Biondi & al. (2014); Mucina & al. (2016).

Suballiances related to alliance *Polygono-Trisetion*:**Suball. *Lathyro linifolii-Trisetenion flavescens* Dierschke 1981 nom. inval.**

Original name: *Lathyro linifolii-Trisetenion* Dierschke 1981 nom. inval. (Art. 2d; 5).

Suball. *Campanulo rhomboidalis-Trisetenion flavescens* Dierschke in Theurillat 1992

Original name: *Campanulo-Trisetenion* Dierschke 1981 nom. inval. (Art. 2d; 5).

Suball. *Violo sudeticae-Trisetenion flavescens* Julve 1993 nom. inval.

Original name: *Violo sudeticae-Trisetenion flavescens* Julve 1993 nom. inval. (Art. 2d; 3b).

Suball. *Alchemillo monticolae-Trisetenion flavescens* Ferrez 2007**Associations related to alliance *Polygono-Trisetion*:****Ass. *Anthoxantho odorati-Agrostietum tenuis* Sillinger 1933**

Remarks: for details see in alliance *Cynosurion*.

Ass. *Meo athamantici-Festucetum rubrae* Bartsch & Bartsch 1940

Original name: *Festuca rubra-Meum athamanticum* Bartsch & Bartsch 1940.

Synonyms: *Meo-Festucetum* Tüxen 1937; *Meo-Festucetum rubrae* Bartsch & Bartsch 1940; *Geranio-Trisetetum flavescens* Knapp 1951; *Meo-Festucetum Oberdorfer* 1957; *Alopecuro-Poëtum chaixii* Blažková 1991; *Meo athamantici-Cirsietum heterophylli* Blažková 1991; plant community *Festuca rubra-Meum* sensu Dierschke 1997; plant community *Festuca rubra-Meum athamanticum* sensu FloraWeb (accessed 26.03.2009).

Remarks: The synonym *Geranio-Trisetetum flavescens* Knapp 1951, mentioned as such by Snowarski (2002-2005), makes *Meo athamantici-Festucetum rubrae* Bartsch & Bartsch 1940 a synonym of *Geranio sylvatici-Trisetetum flavescens* Knapp ex Oberdorfer 1957. A conformation of this is the fact, that *Meo-Festucetum Oberdorfer* 1957 is considered as synonym

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of both *Geranio sylvatici-Trisetetum flavescens* (Dierschke 1997) and *Meo athamantici-Festucetum rubrae* Bartsch & Bartsch 1940 [FloraWeb (accessed 26.03.2009)].

Diagnostic species: *Alchemilla* sp. div., *Campanula rotundifolia* agg. (*C. gentilis*, *C. moravica*, *C. rotundifolia*), *Cirsium heterophyllum*, *Crepis mollis*, *Festuca rubra* agg., *Galium saxatile*, *Hypericum maculatum*, *Meum athamanticum*.

Distribution: Czech Republic, France, Germany, Poland.

Ass. *Heracleo lecoquii-Trisetetum flavescens* (Sussplugas 1935) Br.-Bl. 1948

Distribution: France.

Ass. *Astrantio-Trisetetum* G. Knapp & R. Knapp 1952 ex Oberdorfer 1957

Synonyms: *Astrantio-Trisetetum* G. Knapp & R. Knapp 1952 nom. prov. (Art. 3b); *Rumici-Trisetetum* Passarge 1969 (Art. 29); *Astrantio-Brometum* Machold 1991 p. p. (Art. 1).

Remarks: *Astrantio majoris-Trisetetum flavescens* (Dutoit 1924) Knapp 1951 is mentioned for France.

Diagnostic species: *Carex montana*, *Listera ovata*.

Distribution: Austria, France? [as *Astrantio majoris-Trisetetum flavescens* (Dutoit 1924) Knapp 1951], Germany, Romania, Slovenia, Ukraine.

Variations: Slovenia: subass. *typicum*, subass. *buphthalmetosum* Knapp & Knapp 1952, subass. *trollietosum* Knapp & Knapp 1952.

Ass. *Geranio sylvatici-Trisetetum flavescens* Knapp ex Oberdorfer 1957

Original name: *Geranio-Trisetetum* Knapp 1951 (*Geranium sylvaticum*; *Trisetum flavescens*).

Synonyms: *Trisetetum flavescens* Rübel 1911 sensu lato; *Festucetum rubrae-fallacis* Rübel 1911; *Agrostidetum tenue* Rübel 1912; *Trisetetum flavescens* Berger 1922 (Art. 31); *Agrostidetum vulgare* Szafer & al. 1923 (Art. 36); *Agrostidetum vulgare* Szafer & al. 1927 (Art. 31); *Trisetetum flavescens* Tüxen 1937; *Trisetetum meetosum athamantici* Tüxen 1937; *Meo-Trisetetum flavescens* Tüxen 1937; *Festuca rubra-Meum athamanticum* J. & M. Bartsch 1940; *Meo-Festucetum* Bartsch 1940; *Trisetetum crepidetosum mollis* Moor 1942; *Trisetum flavescens-Gearnium sylvaticum* Knapp 1951 (Art. 3b; 36); *Astrantio-Trisetetum* Oberdorfer 1957 p. p.; *Meo-Festucetum* Oberdorfer 1957; *Geranio (sylvatici)-Trisetetum* Knapp ex Oberdorfer 1957; *Geranio-Trisetetum* Knapp ex Oberdorfer 1957;

Cirsium heterophylli-Trisetetum Hundt 1964; *Centaurea nigrae-Trisetetum* Hundt 1964; *Trisetetum flavescens noricum* Soó 1964; *Laserpitio latifoliae-Trisetetum* Hundt 1964; *Trisetetum flavescens* Hundt 1964; 1969; *Melandrio-Trisetetum* Moravec 1965; *Cardaminopsis halleri-Agrostietum* (Pawłowski & Walas 1949) Moravec 1965; *Cardaminopsis halleri-Agrostietum* Moravec 1965; *Meo-Trisetetum* Dierschke & Vogel 1981. According to internet site FloraWeb (accessed 26.03.2009) incl.: *Meo-Trisetetum* Tüxen 1970; *Astrantio-Trisetetum* Oberdorfer p. p.; According to Ellmauer & Mucina (1993) non: *Trisetetum leponticum* Marschall 1947 (Art. 34).

Diagnostic species: *Agrostis capillaris* (also as dominant), *Alchemilla monticola*, *A. vulgaris* agg., *Alopecurus pratensis*, *Anthriscus sylvestris*, *Arnica montana*, *Bistorta major*, *Campanula rotundifolia* agg. (*C. gentilis*, *C. moravica*, *C. rotundifolia*), *C. patula*, *Cardaminopsis halleri*, *Carum carvi*, *Centaurea pseudophrygia*, *Chaerophyllum aromaticum*, *Crepis biennis*, *C. mollis*, *Crocus discolor*, *Bellis perennis*, *Deschampsia caespitosa*, *Geranium sylvaticum*, *Lychnis flos-cuculi*, *Heracleum sphondylium*, *Hypericum maculatum*, *Pimpinella major*, *Phleum alpinum*, *P. pratense*, *Phyteuma nigrum*, *P. spicatum*, *Rumex arifolius*, *Senecio aurantiacus*, *Taraxacum* Sect. *Ruderalia*, *Trisetum flavescens*, *Vicia cracca*, *V. sepium*, *Viola tricolor* ssp. *saxatilis*.

Remarks: 1) Dierschke (1997) pointed *Festuca rubra-Meum athamanticum* J. & M. Bartsch 1940 as synonym. Thus *Geranio sylvatici-Trisetetum flavescens* Knapp ex Oberdorfer 1957 becomes a synonym of *Meo athamantici-Festucetum rubrae* Bartsch & Bartsch 1940; 2) Hegedúšová & Ružičková (2007) pointed *Geranio sylvatici-Trisetetum flavescens* Knapp ex Oberdorfer 1957 as a syntaxonomical synonym of *Agrostidetum vulgare* Szafer & al. 1923. The latter (according to Medvečka-Kornaš & al. 1966) is given as synonym of *Gladiolo imbricati-Agrostietum capillaris* (Br.-Bl. 1930) Pawłowski & Walas 1949. Thus all three associations become synonyms; 3) Oberdorfer (1993) included *Trisetetum flavescens* Tüxen 1937 in a bigger one – *Poo-Trisetetum flavescens* Knapp 1951. On the other hand, Dierschke (1997) pointed *Trisetetum flavescens* Tüxen 1937 as synonym of *Geranio sylvatici-Trisetetum flavescens* Knapp ex Oberdorfer 1957; 4) Ellmauer & Mucina (1993) consider *Trisetetum flavescens* Hundt 1964 as a separate syntaxon, not synonym.

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Distribution: Austria, Belgium, Czech Republic, France, Germany, Hungary, Poland, Romania, Slovakia, Ukraine.

Variations: Austria: subass. *cirsietosum hetrophylli* Dierschke ex Ellmauer 1995; Czech Republic: subass. *bellidetosum* Blažková in Krahulec & al. 1997 (*Bellis perennis*); subass. *lathyretosum* Blažková in Krahulec & al. 1997 (*Lathyrus pratensis*); subass. *melandrietosum* Blažková in Krahulec & al. 1997 (*Melandrium rubrum*); subass. *nardetosum* Blažková in Krahulec & al. 1997 (*Nardus stricta*); subass. *pimpinellitosum* Blažková in Krahulec & al. 1997 (*Pimpinella saxifraga*); var. *Deschampsia caespitosa*; var. *Trifolium repens*; fac. *alopecurosum pratensis*; fac. *dactyliosum glomeratae*; fac. *holcosum mollis-hypericosum maculatae*; Hungary: subass. *arrhenatheretosum*; subass. *festucetosum rubrae*.

Ass. *Poo-Trisetum flavescens* Knapp ex Oberdorfer 1957

Remarks: for details see in *Arrhenatherion*.

Ass. *Trisetum flavescens-Heracleetum pyrenaici* Br.-Bl. ex O. Bolòs 1957

Synonyms: *Astrantio-Avenuletum pubescentis* Vigo 1984; *Trisetum-Heracleetum pyrenaici* Br.-Bl. in Marschall 1947 (Art. 2b); *Campanulo patulae-Violetum cornutae* Nègre 1972.

Pseudonyms: *Heracleo-Trisetum* auct.

Distribution: France, Iberian peninsula.

Variations: Spain: subass. *typicum*; subass. *astrantioetosum majoris* Vigo 1996 (Corresp. name: *Astrantio-Avenuletum pubescentis* Vigo 1984).

Ass. *Alchemillo filicaulis-Trisetum flavescens* Lambert 1962

Distribution: France.

Ass. *Campanulo rectae-Agrostietum capillaris* (Braun 1915) Hundt 1964

Distribution: France.

Ass. *Trisetum flavescens-Festuca rubra* Soó 1944; Šerbănescu 1964

Distribution: Romania.

Ass. *Leontodo-Festucetum* Carbiener 1966

Distribution: Belgium, France.

Ass. *Alchemillo-Festucetum rubrae* Egger

Homonyms: *Alchemillo-Festucetum rubrae* Resmeriță 1972 nom. illeg. (Art. 31).

Distribution: Poland.

Ass. *Geranio-Alchemilletum crinitae* Hadač & al. 1969

Original name: *Geranio-Alchemilletum crinitae* Hadač & al. 1969 (*Geranium phaeum*; *G. sylvaticum*).

Synonyms: *Alchemilleto-Deschampsietum caespitosae* Bareš & Hadač 1958 (Art. 2b); *Alchemilleto-Festucetum pratensis* Bareš & Hadač 1958 (Art. 2b); *Alchemillo-Deschampsietum caespitosae* Hadač & Smola 1962 (Art. 2b); *Alchemilleto-Festucetum pratensis* Hadač & Smola 1962 (Art. 2b); *Rhinantho-Alchemilletum monticolae* Hadač & Smola 1962 (Art. 2b); *Geranio-Alchemilletum crinitae* Hadač & Smola 1962 (Art. 2b); *Rhinantho-Alchemilletum monticolae* Hadač & al. 1969 (Art. 3b); *Alchemillo-Deschampsietum caespitosae* Hadač & al. 1969; *Rhinantho-Alchemilletum monticolae* Hadač & al. 1969; *Alchemillo-Festucetum pratensis* Hadač & al. 1969; *Geo-Dactylidetum slovenicae* Hadač 1981 (Art. 34a); *Hyperico-Deschampsietum caespitosae* Hadač 1981; *Rhinantho pulchri-Alchemilletum monticolae* Hadač & al. ex Kliment 1994.

Pseudonyms: *Alchemilletum pastoralis* sensu Šmarda & al. 1963; 1971 p. p. non Szafer & al. 1927; *Deschampsietum caespitosae* sensu Unar & al. 1984 non Krajina 1933; *Deschampsietum caespitosae typicum* sensu Unar & al. 1984 non Krajina 1933.

Diagnostic species: *Acetosa arifolia*, *Bistorta major*, *Campanula serrata*, *Conioselinum tataricum*, *Crepis mollis*, *Dianthus superbus*, *Geranium sylvaticum*, *Hypericum maculatum*, *Knautia maxima*, *Phyteuma spicatum*, *Pimpinella major*, *Potentilla aurea*, *Rhinanthus pulcher*, *Senecio subalpinus*, *Trollius altissimus*, *Viola biflora*.

Distribution: Slovakia.

Variations: var. *Pimpinella major* ssp. *rhodochlamys*; var. *Trisetum flavescens*.

Ass. *Meo athamantici-Trisetum flavescens* Lacoste 1975

Distribution: France.

Ass. *Phyteumo orbicularis-Trifolietum pratensis* Balcerk. 1978

Diagnostic species: *Carex sempervirens*, *Phyteuma orbiculare*, *Polygala amara* ssp. *brachyptera*, *Primula elatior*, *Ranunculus oreophilus*.

Distribution: Poland.

Ass. *Geranio lividi-Trisetum* Knapp & Knapp ex Dierschke 1981

Synonyms: *Trisetum flavescens-Geranium lividum* Knapp & Knapp 1954 (Art. 3b).

Diagnostic species: *Geranium phaeum* ssp. *lividum*, *Trisetum flavescens*.

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Distribution: Austria.

Ass. *Euphorbio brittingeri-Trisetetum flavescens* de Foucault 1986

Distribution: Belgium, France.

Variations: Belgium: subass. *typicum*; subass. *brometosum erecti*; subass. *brometosum mollis*; France: subass. *typicum*; subass. *brometosum erecti* de Foucault in Ferrez 2007; subass. *brometosum mollis*; subass. *kanutietosum godeti* Ferrez 2007; subass. *trollietosum europaei* Ferrez 2007.

Ass. *Violo cornutae-Trisetetum flavescens* (Nègre 1972) Gruber 1986

Distribution: France.

Ass. *Violo luteae-Trisetetum flavescens* (Luquet 1926) de Foucault 1986

Distribution: France.

Ass. *Centaureo transalpinae-Trisetetum flavescens* (Marschall 1947) Poldini & Oriolo 1994

Synonyms: *Trisetetum insubricum* Marsch. 1947 (Art. 34); *Trisetetum leponicum* Marschall 1947 (Art. 34).

Pseudonyms: *Trisetetum flavescens* Pedrotti 1964 non Brockmann-Jerosch 1907; *Trisetetum flavescens* Gerdol & Piccoli 1980 non Beger 1923; *Trisetetum flavescens* Buffa & al. 1989 non Brockmann-Jerosch 1907.

Distribution: Italy.

Ass. *Melandrio rubri-Phleetum alpini* Blažková in Krahulec & al. 1997

Original name: *Melandrio-Phleetum alpini* Blažková in Krahulec & al. 1997 (*Melandrium rubrum* = *Silene dioica*; *Phleum alpinum* = *P. rhaeticum*).

Diagnostic species: *Alchemilla vulgaris* s. lat., *Bistorta major*, *Campanula bohemica*, *Cardaminopsis halleri*, *Crepis conyzifolia*, *C. mollis*, *Geranium sylvaticum*, *Hypericum maculatum*, *Omalotheca sylvatica*, *Phleum rhaeticum*, *Phyteuma spicatum*, *Poa chaixii*, *Potentilla aurea*, *Silene dioica*, *S. vulgaris*, *Viola lutea* ssp. *sudetica*.

Distribution: Czech Republic.

Variations: subass. *alopecuretosum* Blažková in Krahulec & al. 1997 (*Alopecurus pratensis*); subass. *nardetosum* Blažková in Krahulec & al. 1997 (*Nardus stricta*) with the following variants – var. *typicum*, var. *Luzula luzuloides*, var. *Trisetum flavescens*, var. *Viola lutea*, var. *Viola lutea* ssp. *sudetica* (Corresp. name: *Melandrio rubri-Phleetum alpini* Blažková in Krahulec & al. 1997 subass. *violetosum luteae* Blažková in Krahulec & al. 1997).

Ass. *Alchemillo xanthochlorae-Trollietum europaei* Vigo ex Vigo in Ninot & al. 2000

Original name: *Alchemillo-Trollietum* Vigo 1979 nom. illeg. (Art. 5).

Synonyms: *Delphinio montani-Trollietum europaei* Br.-Bl. 1948 (Art. 3b); *Violo cornutae-Euphorbietum hybernae* Romo 1986 p. p. (Art. 37).

Distribution: Iberian Peninsula.

Variations: Spain: subass. *typicum*; subass. *rumicetosum amplexicaulis* Carreras & al. in Ninot & al. 2000 (Basionym: *Alchemillo-Trollietum* Vigo 1979 subass. *rumicetosum amplexicaulis* Carreras & al. 1993 nom. invall.)

Ass. *Campanulo glomeratae-Geranium sylvatici* Ružičková 2002

Diagnostic species: *Anthyllis vulneraria*, *Aquilegia vulgaris*, *Arrhenatherum elatius*, *Campanula glomerata* agg., *C. serrata*, *Carlina acaulis*, *Cirsium erisithales*, *Colchicum autumnale*, *Crocus discolor*, *Dianthus carthusianorum* agg., *Geranium sylvaticum*, *Jacea phrygia* agg. (*J. phrygia*, *J. pseudophrygia*, *J. stenolepis*), *Knautia arvensis* agg., *Leontodon hispidus*, *Lilium bulbiferum*, *Pimpinella major*, *Polygala vulgaris*, *Potentilla heptaphylla*, *Primula elatior*, *Pyrethrum corymbosum*, *Silene nemoralis*, *S. vulgaris*, *Tragopogon orientalis*, *Trifolium montanum*, *Trisetum flavescens*.

Distribution: Slovakia.

Variations: subass. *typicum*; subass. *brometosum erecti* Ružičková 2002; var. *Bromus erectus*; var. *Luzula luzuloides*.

Ass. *Crepido mollis-Agrostietum capillaris* Ružičková 2004

Original name: *Crepido mollis-Agrostietum* Ružičková 2004 (*Agrostis capillaris*).

Diagnostic species: *Cardaminopsis halleri*, *Crepis mollis*, *Jacea phrygia* agg. (*J. phrygia*, *J. pseudophrygia*, *J. stenolepis*), *Luzula luzuloides*, *Physostegia virginiana*, *Phyteuma spicatum*, *Pilosella aurantiaca*, *Poa chaixii*, *Primula elatior*, *Ranunculus polyanthemus*, *Traunsteinera globosa*, *Trifolium medium* agg. *Tromsdorfia uniflora*.

Distribution: Slovakia, Ukraine.

Ass. *Alchemillo monticolae-Brometum mollis* Ferrez 2007

Diagnostic species: *Alchemilla monticola*, *A. xanthochlora*, *Anthriscus sylvestris*, *Bromus hordeaceus* ssp. *hordeaceus*, *Geranium sylvaticum*, *Heracleum sphondylium* ssp. *sphondylium*, *Polygonum bistorta*, *Trisetum flavescens* ssp. *flavescens*.

Distribution: France.

Annex 1. Continuation.**Plant communities without rank related to alliance *Polygono-Trisetion*:****Plant community *Trisetum flavescens-Cynosurus cristatus* Buzo 1990**

Distribution: Albania.

Plant community *Festuca rubra-Agrostis tenuis* sensu Dierschke 1997 non Glavač 1983

Distribution: Germany.

Plant community *Anthoxanthum odoratum-Geranium sylvaticum* sensu Rodwell & al. 2000

Distribution: United Kingdom.

References: Moravec (1965); Borza (1966); Csűrös-Káptalan (1970); Dihoru (1975); Reif & al. (1989); Sanda & Popescu (1991); Oberdorfer (1993); Poldini & Oriolo (1994); Ellmauer (1995); Kovács (1995); Dierschke (1997); Krahulec & al. (1997); Gèhu (1999); Sanda & al. (1999); Ninot & al. (2000); Rodwell & al. (2000); Rivas-Martínez & al. (2001); Soriano (2001); Dring & al. (2002); Pop & al. (2002); Ružičková (2002); Bardat & al. (2004); Sarbu & al. (2004); Snowarski (2002-2005); Slivinska & Balashov (2006); Ferrez (2007); Hájková & al. (2007); Hegedüšová & Ružičková (2007); Solomakha (2008); Jarolímek & al. (2008b); Škodová & Janišová (2008); FloraWeb (accessed 26.03.2009); Wolański & Trąba (2009); Chocarro & al. (2010); Petras Sackl & al. (2012); Šilc & Čarni (2012); Tasenkevich & Kalinovich (2013); Rodríguez-Rojo & al. (2014); Budzhak & al. (2016).

Alliance *POION ALPINAE* Gams ex Oberdorfer 1950

Original name: *Poion alpinae* Gams 1936 nom. nud. (Art. 2b; 8).

Synonyms: *Poion alpinae* Rübel 1933 (Art. 2b; 8); *Achilleo-Poion alpinae* (Gams ex Oberd. 1950) Passarge 1969; *Astero bellidiastri-Poion alpinae* Passarge 1969; *Carlino-Poion alpinae* Passarge 1969; *Eu-Achilleo-Poion alpinae* Passarge 1969; *Eu-Carlino-Poion alpinae* Passarge 1969; *Eu-Rumici-Poion alpinae* Passarge 1969; *Phleo alpini-Poion alpinae* Passarge 1969; *Ranunculo-Poion alpinae* Passarge 1969.

Corresponding names: *Poo-Phleetalia alpini* Passarge 1969; *Trifolienalia* Oberdorfer 1990 p. p.; *Poo alpinae-Trisetetalia* Mucina & al. 1993 p. p.

Remarks: Mucina & al. (2016) related alliance *Poion alpinae* to *Poo alpinae-Trisetetalia* Ellmauer & Mucina 1993 order.

Diagnostic species: *Achillea sudetica*, *Aconitum variegatum*, *Agrostis alpina*, *A. capillaris*, *Anthoxanthum odoratum*, *Avenula versicolor*, *Campanula scheuchzeri*, *C. serrata*, *Crex pallescens*, *Cerastium cerastoides*, *C. fontanum*, *Crepis aurea*, *Deschampsia caespitosa*, *Euphrasia minima*, *E. picta*, *Festuca nigrescens*, *F. rubra*, *F. violacea*, *Galium anisophyllum*, *Geum montanum* (= *Oreogeum m.*), *Homogyne alpina*, *Ligusticum mutellina*, *Nardus stricta*, *Pedicularis verticillata*, *Phleum alpinum*, *P. rhaeticum*, *Plantago alpina*, *P. atrata*, *Poa alpina*, *P. media*, *P. supina*, *Potentilla aurea*, *P. ternata*, *Prunella vulgaris*, *Ranunculus montanus*, *Sagina saginoides*, *Senecio subalpinus*, *Thymus pulcherrimus*, *Trifolium badium*, *T. kotulae*, *T. pratense* var. *nivale*, *T. thalii*, *Veronica alpina*, *V. serpyllifolia*.

References: Horvat (1960); Jurko (1974); de Foucault (1984; 1989); Ellenberg (1988); Sanda & Popescu (1991); Ellmauer & Mucina (1993); Oberdorfer (1993); Dierschke (1997; 1999); Zuidhoff & al. (1995); Bardat & al. (2001); Burkart & al. (2004); Sarbu & al. (2004); Meshinev & al. (2005); Hegedüšová (2007); Jarolímek & al. (2008a); Škodová & Janišová (2008); Biondi & Blasi (2013); Mucina & al. (2016).

Associations related to *Poion alpinae*:**Ass. *Trifolio thalii-Festucetum violaceae* Br.-Bl. in Br.-Bl. & Jenny 1926**

Distribution: France, Germany.

Ass. *Alchemilletum pastoralis* Szafer & al. 1927

Synonyms: *Alchemilletum* Szafer & al. 1923 (Art. 2b); *Prunello vulgaris-Poetum alpinae* Oberdorfer 1950; *Agrostio vulgari-Poetum alpinae* Bělohávková 1980 nom. ined. (Art. 1).

Pseudonyms: *Anthoxantho-Agrostietum* sensu Unar & al. 1984 non Silinger 1933.

Diagnostic species: *Aconitum variegatum*, *Euphrasia minima* agg., *Galium pumillum* agg., *Ligusticum mutellina*, *Oreogeum montanum*, *Phleum rhaeticum*, *Poa alpina*, *Senecio subalpinus*, *Taraxacum* Sect. *alpina*, *Tephrosia capitata*, *Thymus pulcherrimus*.

Distribution: Slovakia.

Ass. *Crepido aureae-Festucetum commutatae* Lüdi 1948

Synonyms: *Trifolietum repennis* Rübel 1911; *Poetum alpinae* Rübel 1911 (Art. 36); 1912; *Crepido-Festucetum rubrae* Lüdi 1948; *Prunello-Poetum alpinae* Oberdorfer

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1950; *Poo-Prunelletum* Oberdorfer 1950; *Poo alpinae-Prunelletum vulgare* Oberdorfer 1957; *Poa alpina-Alchemilla palmata* Beldie 1967; *Crepido aureae-Cynosuretum* Dietl 1972; *Alchemillo-Poëtum alpinae* (Beldie 1967) Resmeriță 1972; *Trifolio badii-Poëtum* Dietl 1982 (Art. 2b). Non: *Poëtum alpinae* Braun 1913 (Art. 36); *Poëtum alpinae* sensu Smettan 1981 (Art. 36).

Diagnostic species: *Alchemilla palmata*, *Crepis aurea*, *Festuca nigrescens*, *Taraxacum alpinum* ssp. *nigricans*, *Trifolium badium*.

Distribution: Austria, France, Germany, Romania, Slovenia.

Ass. *Crepido-Cynosuretum* Knapp ex Dietl 1972

Synonyms: *Crepido-Cynosuretum* Knapp 1962 (Art. 2b).

Pseudonyms: *Poo-Prunelletum* sensu Smettan 1981.

Distribution: Austria.

Ass. *Crepido aureae-Poëtum alpinae* Poldini & Oriolo 1994

Pseudonyms: *Poo-Prunelletum* Poldini non Oberd. 1950; *Crepido-Festucetum rubrae* Lausi & al. 1981 non Ludi 1948.

Distribution: Italy.

Plant communities without rank related to *Poion alpinae*:**Plant community *Deschampsia caespitosa-Veratrum album/lobelianum* sensu Poldini & Oriolo 1994**

Distribution: Italy.

References: Beldie (1967); Sanda & Popescu (1991); Ellmauer & Mucina (1993); Ellmauer (1995); Oberdorfer (1993); Poldini & Oriolo (1994); Dierschke (1997; 1999); Géhu (1999); Sarbu & al. (2004); Hegedüšová (2007); Jarolímek & al. (2008b); Škodová & Janišová (2008); FloraWeb (accessed 26.03.2009); Šilc & Čarni (2012).

Alliance *PANČIĆION SERBICAE* Lakušić 1966

Synonyms: *Pancicion serbicae* Lakušić 1964 (Art. 1).

Diagnostic species: *Anemone narcissiflora*, *Astrantia elatior*, *Crepis aurea* var. *bosniaca*, *Leucanthemum vulgare* s.l., *Pancicia serbica*, *Phleum alpinum*, *Pimpinella serbica*, *Rhinanthus rumelicus*.

Remarks: Mucina & al. (2016) related alliance *Pancicion serbicae* to *Poo alpinae-Trisetetalia* Ellmauer & Mucina 1993 order.

References: Lakušić & al. (2005); Šilc & al. (2014); Mucina & al. (2016).

Associations related to *Pančićion serbicae*:**Ass. *Ranunculo-Pančićietum serbicae* Lakušić 1966**

Distribution: Montenegro.

Ass. *Trifolio-Polygaletum azureae* Lakušić 1966

Distribution: Montenegro.

Ass. *Knautio-Cynosuretum cristati* Blečić & Tatić 1967

Diagnostic species: *Carum carvi*, *Cynosurus cristatus*, *Knautia montenegrina*, *Ophioglossum vulgatum*, *Poa trivialis*.

Remarks: Blečić & Tatić (1967) refer this association to *Arrhenarherion*.

Distribution: Montenegro, Serbia.

Variations: Montenegro: subass. *genistetosum sagittalis* Blečić & Tatić 1967; subass. *potentilletosum tormentillae* Blečić & Tatić 1967.

Ass. *Pancicio-Lilietum bosniacae* Bjelčić & Lakušić 1969

Distribution: Bosnia and Herzegovina.

Ass. *Festuco-Pančićietum serbicae* K. Tomić 1970

Distribution: Serbia.

Ass. *Hypochoeri-Crepidetum conizifoliae* Redžić 1990

Distribution: Bosnia and Herzegovina.

Ass. *Pančićio-Centaureetum nervosae* Lakušić nom. prov.

Distribution: Serbia.

References: Blečić & Tatić (1967); Blečić & Lakušić (1976); Kojić & al. (1998); Stešević & Petrović (2004); Lakušić & al. (2005); Redžić (2007); Redžić & al. (2013).

Alliance *BRACHYPODIO RUPESTRIS-CENTAUREION NEMORALIS* Br.-Bl. 1967

Synonyms: *Lino biennis-Gaudinion fragilis* (Br.-Bl. 1967) de Foucault 1989 (Art. 29); *Gaudinio fragilis-Cynosurion cristati* (Rivas Goday & Rivas-Mart. 1963) Géhu 2006 (Art. 5).

Remarks: See the synonymy and remark №2 of *Arrhenatherion elatioris* Luquet 1926.

References: Fernez & Causse (2015), Mucina & al. (2016).

Annex 1. Continuation.**Alliance ALCHEMILLO-RANUNCULION REPENTIS
Passarge 1979**

Synonyms: *Potentillion anserinae* Tüxen 1947; *Plantagini-Prunellion* Eliáš 1980.

Remarks: 1. Chytrý & Blažková (2007) pointed *Plantagini-Prunellion* Eliáš 1980 as a synonym of *Cynosurion cristati* Tüxen 1947; 2. Biondi & al (2014) pointed *Alchemillo-Ranunculion repentis* Passarge 1979 as syntax. syn. of *Potentillion anserinae* Tüxen 1947 within *Potentillo anserinae-Polygonetalia avicularis* Tüxen 1947 order; 3. Mucina & al. (2016) subordinated *Alchemillo-Ranunculion repentis* Passarge 1979 to *Arrhenatheretalia elatioris* order.

References: Biondi & Blasi (2013); Biondi & al. (2014); Mucina & al. (2016).

**Alliance FESTUCION PRATENSIS Sipaylova & al.
1985**

Diagnostic species: *Agrostis gigantea*, *Carduus crispus*, *Carum carvi*, *Daucus carota*, *Elymus repens*, *Eryngium planum*, *Festuca pratensis*, *F. rubra*, *Geranium pratense*, *Heracleum sibiricum*, *Hypericum perforatum*, *Lathyrus pratensis*, *Oenothera rubricaulis*, *Phleum pratense*, *Poa pratensis*, *Rumex confertus*, *R. crispus*, *R. pseudonatronatus*, *R. thyrsoiflorus*, *Selinum carvifolia*, *Silene nutans*, *Taraxacum officinale*, *Thalictrum lucidum*, *Trifolium hybridum*, *T. pratense*, *Vicia cracca*.

Remarks: This alliance is pointed in Kuzemko (2016) and Mucina & al. (2016) as synonym of *Arrhenatherion elatioris* Luquet 1926.

References: Stepanovich (2000); Goncharenko (2001); Bobrovsky (2004); Veen & al. (2007); Mikhailovna (2008); Solomakha (2008); Kuzemko (2009b; 2016).

Suballiances related to Festucion:**Suball. Festucenion pratensis Mirkin & Naumova 1986**

References: Mikhailovna (2008).

Associations related to Festucion pratensis:**Ass. Festucetum pratensis Soó 1938**

Remarks: For details see in *Arrhenatherion elatioris*.

Ass. Poëtum pratensis Ravarut, Cazac & Turenschi 1956

Distribution: Ukraine.

Ass. Agrostietum albae Michalko & Petrářnová 1967

Diagnostic species: *Agrostis gigantea*.

Distribution: Ukraine.

Variations: subass. *typicum* with three variants – var. *typicum*, var. *Alopecurus pratensis*, var. *Carex nigra*; subass. *hieracietosum umbellati* Kuzemko 2009 with two variants – var. *Calamagrostis epigeios*, var. *Poa palustris*.

**Ass. Deschampsio-Festucetum rubrae Mirkin & Sa-
pegin 1985**

Diagnostic species: *Deschampsia caespitosa*, *Festuca rubra*, *Poa pratensis*.

Distribution: Ukraine.

Variations: subass. *typicum*; subass. *filipenduletosum ulmariae* Kuzemko 2009 with three variants – var. *typicum*, var. *Anthoxanthum odoratum*, var. *Plantago major*.

**Ass. Festuco pratensis-Deschampsietum caespitosae
Shelyag & al. in Shelyag & al. 1985**

Diagnostic species: *Deschampsia caespitosa*, *Festuca pratensis*, *Trifolium repens*.

Distribution: Ukraine.

Variations: subass. *anthoxanthesetosum odorati* Kuzemko 2009; subass. *carisetosum nigrae* Kuzemko 2009 with two variants – var. *Agrostis canina*; var. *Poa pratensis*.

**Ass. Bromopsi inermis-Alopecuretum pratensis Mir-
kin in Denisova & al. 1986**

Diagnostic species: *Alopecurus pratensis*, *Bromopsis inermis* (= *Bromus inermis*).

Distribution: Russia (Komi Republic).

**Ass. Festuco pratensis-Deschampsietum caespitosae
Turubanova 1986**

Distribution: Russia (Komi Republic), Ukraine.

**Ass. Vicio craccae-Agrostietum giganteae Mirkin in
Denisova & al. 1986**

Distribution: Russia.

**Ass. Agrostio gigantea-Festucetum pratensis Sipay-
lova & al. 1987**

Diagnostic species: *Agrostis gigantea*, *Festuca pratensis*, *F. rubra*, *Poa pratensis*.

Distribution: Ukraine.

Variations: subass. *typicum*; subass. *deschampsietosum caespitosae* Kuzemko 2009 with three variants – var. *typicum*, var. *Carex pallescens*, var. *Carex praecox*;

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subass. *festucetosum orientalis* Kuzemko 2009; subass. *juncetosum compressi* Kuzemko 2009.

Ass. *Festuco pratensis-Dactylidetum glomeratae* Dymina 1989

Distribution: Russia.

Ass. *Elytrigio repentis-Vicietum craccae* Smetana & al. 1997

Diagnostic species: *Vicia cracca*.

Distribution: Ukraine.

Ass. *Vicietum craccae* Smetana & al. 1997

Diagnostic species: *Vicia cracca*.

Distribution: Ukraine.

Ass. *Dactylidetum glomeratae* Stepanovič (1987) 1999

Diagnostic species: *Dactylis glomerata*.

Distribution: Belarus.

Variations: subass. *brizetosum mediae* sensu Stepanovich 2000; subass. *bromopsidetum inermis* sensu Stepanovich 2000; subass. *elytrigietosum repentis* sensu Stepanovich 2000; subass. *festucetosum pratensis* sensu Stepanovich 2000; subass. *phleetosum pratensi* sensu Stepanovich 2000; subass. *poetosum pratensis* sensu Stepanovich 2000.

Ass. *Phleetum pratensi* Stepanovič 1999

Diagnostic species: *Phleum pratense*.

Distribution: Belarus.

Variations: subass. *deschampsietosum cespitosae* sensu Stepanovich 2000; subass. *festucetosum pratensis* sensu Stepanovich 2000; subass. *festucetosum rubrae* sensu Stepanovich 2000; subass. *poetosum pratensis* sensu Stepanovich 2000; subass. *trifolietosum pratensi* sensu Stepanovich 2000.

Ass. *Poetum pratensis* Stepanovič 1999

Diagnostic species: *Poa pratensis*.

Distribution: Belarus, Ukraine (also in *Cynosurion*).

Variations: Belarus: subass. *agrostidetosum tenuis* sensu Stepanovich 2000; subass. *deschampsietosum cespitosae* sensu Stepanovich 2000; subass. *festucetosum pratensis* sensu Stepanovich 2000; subass. *festucetosum rubrae* sensu Stepanovich 2000; subass. *poetosum trivialis* sensu Stepanovich 2000; subass. *phleetosum pratensi* sensu Stepanovich 2000; subass. *trifolietosum repentis* sensu Stepanovich 2000; Ukraine: subass. *typicum*; subass. *festucetosum rubrae* Kuzemko 2009 with three variants – var. *typicum*, var. *Anthoxanthum odoratum*, var. *Carex nigra*; var. *typicum*; var. *Elytrigia repens*; var. *Festuca rubra*; var. *Trifolium repens*.

Ass. *Trifolietum pratensi* Stepanovič 1999

Diagnostic species: *Trifolium pratense*.

Distribution: Belarus.

Variations: subass. *dactylidetosum glomeratae* sensu Stepanovich 2000; subass. *festucetosum pratensis* sensu Stepanovich 2000; subass. *festucetosum rubrae* sensu Stepanovich 2000; subass. *lotetosum corniculati* sensu Stepanovich 2000; subass. *phleetosum pratensi* sensu Stepanovich 2000; subass. *poetosum pratensis* sensu Stepanovich 2000; subass. *trifolietosum repentis* sensu Stepanovich 2000.

Ass. *Carici vulpinae-Juncetum effusi* Goncharenko 2002

Pseudonyms: *Scirpetum sylvatici* sensu auct. p. p.

Diagnostic species: *Caltha palustris*, *Carex vulpina*, *Crepis paludosa*, *Geum rivale*, *Juncus effusus*, *Scirpus sylvaticus*.

Distribution: Ukraine.

Ass. *Galio veri-Agrostietum tenuis* Goncharenko 2002

Pseudonyms: *Anthoxantho-Agrostietum* sensu auct. p. p.

Diagnostic species: *Agrostis capillaris*, *Briza media*, *Galium verum*, *Luzula campestris*, *Rumex thyrsiflorus*.

Distribution: Ukraine.

Ass. *Medicago lupulinae-Phleetum pratensis* Goncharenko 2002

Diagnostic species: *Festuca orientalis*, *Medicago lupulina*, *Phleum pratense*, *Rhinanthus vernalis*, *Vicia cracca*.

Distribution: Ukraine.

Ass. *Tussilago farfarae-Phleetum pratensis* Vetluzhskikh 2006

Diagnostic species: *Artemisia vulgaris*, *Dactylis glomerata*, *Festuca pratensis*, *Phleum pratense*, *Picris hieracioides*, *Salix caprea*, *S. viminalis*, *Tussilago farfara*, *Urtica dioica*.

Variations: var. *Arctium tomentosum*; var. *Crepis tectorum*; var. *Phalaroides arundinacea*; var. *Verbascum thapsus*; var. *Pinus sylvestris*.

Distribution: Russia.

Ass. *Elytrigio repentis-Bromopsidetum inermis* Yamalov 2011

Distribution: Russia (Komi Republic).

Ass. *Festucetum pratensis-regeliana* Kuzemko 2012
Diagnostic species: *Achillea inundata*, *Carex distans*, *Festuca regeliana*.

Distribution: Ukraine.

References: Stepanovich (2000); Goncharenko (2001); Vetluzhskikh (2006); Chinkina (2006); Astakhova (2007); Mikhailovna (2008); Solomakha (2008);

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Kuzemko (2009b, 2012); Kozyr (2013); Shushpannikova & Yamalov (2014).

Alliance PHYTEUMATO-TRISETION Ellmauer & Mucina 1993

Synonyms: *Phyteumato-Trisetion flavescens* Hundsdt ex Passarge 1969 (Art. 3d).

Remarks: See the synonymy and remarks of alliance *Polygono bistortae-Trisetion flavescens* Br.-Bl. & Tüxen ex Marschall 1947.

References: Mucina & al. (2016).

Alliance RUMICION THYRSIFLORI Micevski 1994

Diagnostic species: *Achillea collina*, *Inula britannica*, *Cinosurus cristatus*, *Euphrasia stricta*, *Geranium brutium*, *Lolium perenne*, *Lotus corniculatus*, *Matricaria trichophylla*, *Plantago lanceolata*, *Potentilla recta* var. *pilosa*, *Ranunculus polyanthemos*, *Rumex thyrsoiflorus*, *Trifolium micranthum*.

Remarks: This alliance has been described from the Republic of Macedonia and classified within *Trifolio-Hordeetalia* Horvatić 1963 order (Micevski 1994; Melovski & Matevski 2008). Later Mucina & al. (2016) include *Rumicion thyrsoiflori* within *Arrhenatheretalia elatioris* order.

References: Micevski (1994); Melovski & Matevski (2008); Matevski (2010); Mucina & al. (2016).

Associations related to *Rumicion thyrsoiflori*:**Ass. *Trisetum-Rumicetum thyrsoiflori* Micev. 1994 (*Trisetum flavescens*)**

Diagnostic species: *Matricaria trichophylla*, *Ranunculus polyanthemos*, *Rhinanthus major*, *Trisetum flavescens*.

Distribution: Republic of Macedonia.

References: Micevski (1994); Matevski (2010).

Alliance POTENTILION-RANUNCULION REPENTIS sensu Veen & al. 2007 nom. prov.

Diagnostic species: *Juncus articulatus*, *Mentha arvensis*, *Myosotis scorpioides*, *Potentilla anserina*, *Prunella vulgaris*, *Ranunculus flammula*, *R. repens*, *Sium latifolium*, *Veronica scutellata*.

Remarks: The name of the alliance is not in accord-

ance with the rules of ICPN (Weber & al. 2000). The alliance is mentioned for Belarus. According to Veen & al. (2007) this syntaxon needs more investigations.

References: Veen & al. (2007).

Alliance TRIFOLIO (PRATENSE)-BRIZION ELATIORIS Didukh & Kuzemko 2009

Diagnostic species: *Briza elatior*, *Dianthus capitatus*, *Dorycnium herbaceum*, *Eryngium campestre*, *Inula aspera*, *Luzula multiflora*, *Polygala major*, *Potentilla depressa*, *Poterium polygonum*, *Primula acaulis*, *Pyrethrum corymbosum*, *Scabiosa columbaria*, *Trifolium pratense*, *Vicia tenuifolia*.

References: Didukh & Kuzemko (2009); Kuzemko (2009b); Mucina & al. (2016).

Associations related to *Trifolio-Brizion*:**Ass. *Trifolio (pratense)-Brizetum elatioris* Didukh & Kuzemko 2009**

Diagnostic species: *Briza elatior*, *Dianthus capitatus*, *Dorycnium herbaceum*, *Eryngium campestre*, *Inula aspera*, *Luzula multiflora*, *Polygala major*, *Potentilla depressa*, *Poterium polygonum*, *Primula acaulis*, *Pyrethrum corymbosum*, *Scabiosa columbaria*, *Trifolium pratense*, *Vicia tenuifolia*.

Distribution: Ukraine.

Variations: var. *typicum*; var. *Fragaria vesca*; var. *Salvia verticillata*.

References: Didukh & Kuzemko (2009); Kuzemko (2009b).

Alliance HELICTOTRICHON (COMPRESSI)-BISTORTION OFFICIALIS Didukh & Kuzemko 2009

Diagnostic species: *Ajuga genevensis*, *Alopecurus vaginatus*, *Brachypodium pinnatum*, *Bromopsis cappadocica*, *B. riparia*, *Carex pallescens*, *Centaurea fusco-marginata*, *Cerastium biebersteinii*, *Cruciata taurica*, *Gentiana cruciata*, *Helictotrichon compressum*, *Hypericum tauricum*, *Linum nervosum*, *Luzula campestris*, *Pedicularis sibthorpii*, *Polygonum bistorta*, *Trifolium alpestre*, *T. medium*, *Veronica gentianoides*.

References: Didukh & Kuzemko (2009); Kuzemko (2009b).

Annex 1. Continuation.**Associations related to *Helictotricho-Bistortion*:****Ass. *Helictotricho (compressi)-Bistortetum officinalis* Didukh & Kuzemko 2009**

Diagnostic species: *Ajuga genevensis*, *Alopecurus vaginatus*, *Brachypodium pinnatum*, *Bromopsis cappadocica*, *B. riparia*, *Carex pallescens*, *Centaurea fusco-marginata*, *Cerastium biebersteinii*, *Cruciata taurica*, *Gentiana cruciata*, *Helictotrichon compressum*, *Hypericum tauricum*, *Linum nervosum*, *Luzula campestris*, *Pedicularis sibthorpii*, *Polygonum bistorta*, *Trifolium alpestre*, *T. medium*, *Veronica gentianoides*.

Distribution: Ukraine.

Variations: var. *Alchemilla tittantha*; var. *Myosotis lithospermifolia*.

References: Didukh & Kuzemko (2009); Kuzemko (2009b).

Alliance SALVIO PRATENSIS-DACTYLIDION GLOMERATAE Ubaldi & al. in Ubaldi 2003

Synonyms: *Ranunculo neapolitani-Arrhenatherion elatioris* Allegrezza & Biondi 2011 (Art. 5).

Diagnostic species: *Achillea collina*, *Arrhenatherum elatius*, *Centaurea nigrescens* ssp. *neapolitana*, *Dasyphyrum villosum*, *Heracleum sphondylium* ssp. *ternatum*, *Pastinaca sativa* ssp. *urens*, *Ranunculus neapolitanus*, *R. velutinus*, *Rhinanthus personatus*.

References: Allegrezza & Biondi (2011); Biondi & Blasi (2013); Biondi & al. (2014); Mucina & al. (2016).

Associations related to *Salvio pratensis-Dactylidion glomeratae*:**Ass. *Pastinaco urentis-Arrhenatheretum elatioris* Biondi & Allegrezza 1996**

Diagnostic species: *Inula viscosa*, *Tussilago farfara*, *Pulicaria dysenterica*, *Hedysarum coronarium*, *Blackstonia perfoliata*, *Senecio erucifolius*, *Festuca arundinacea*.

Distribution: Italy.

Ass. *Festuco circummediterraneae-Arrhenatheretum elatioris* Allegrezza 2003

Diagnostic species: *Galium verum* ssp. *verum*, *Onobrychis viciifolia*, *Festuca rubra* agg., *Galium mollugo* ssp. *erectum*, *Bunium bulbocastanum*, *Centaurea scabiosa*, *Festuca circummediterranea*, *F. rupicola*, *Trifolium incarnatum* ssp. *molinerii*, *Dasyphyrum villosum*.

Distribution: Italy.

Variations: subass. *festucetosum circummediterraneae* Allegrezza & Biondi 2011; subass. *trisetetosum flavescens* Allegrezza & Biondi 2011; subass. *hypericetosum perforati* Allegrezza & Biondi 2011.

Ass. *Ranunculo neapolitani-Arrhenatheretum elatioris* Allegrezza & Biondi 2011

Diagnostic species: *Tragopogon pratensis*, *Taraxacum officinale*, *Holcus lanatus*, *Salvia pratensis*, *Cynosurus cristatus*, *Geranium dissectum*, *Trifolium campestre*, *Galium mollugo* ssp. *mollugo*, *Heracleum sphondylium* ssp. *ternatum*, *Salvia verticillata*, *Trisetum flavescens*, *Colchicum lusitanum*.

Distribution: Italy.

Variations: subass. *ranunculetosum neapolitani* Allegrezza & Biondi 2011 (Syn.: *Arrhenatheretum sensu* Pedrotti 1963; plant community *Arrhenatherum elatius* sensu Venanzoni 1992); subass. *ranunculetosum velutini* Allegrezza & Biondi 2011; subass. *agropyretosum repentis* Allegrezza & Biondi 2011.

References: Venanzoni (1992); Allegrezza & Biondi (2011).

Alliance ANTHRISCO SYLVESTRIS-ARRHENATHERION ELATIORIS Rodríguez-Rojo & al. 2017

Diagnostic species: *Anthriscus sylvestris*, *Cirsium arvense*, *Convolvulus arvensis*, *Elytrigia repens*, *Galium aparine*, *Potentilla reptans*, *Urtica dioica*.

Remarks: Recently described West and Central European alliance within *Molinio-Arrhenatheretea* class, *holotypus* – *Tanaceto-Arrhenatheretum* Fischer ex Ellmauer in Mucina & al. 1993. Order relation not explicitly specified, but presumably belonging to *Arrhenatheretalia*?

Ass. *Tanaceto vulgaris-Arrhenatheretum elatioris* Fischer ex Ellmauer in Mucina & al. 1993

Remarks: for details see in alliance *Arrhenatherion*.

Distribution: West and Central Europe.

Ass. *Vicio sepium-Arrhenatheretum* O'Sullivan 1982

Remarks: for details see in alliance *Arrhenatherion*.

Distribution: West and Central Europe.

Plant community *Urtica dioica-Arrhenatherum sensu* Rodríguez-Rojo & al. 2017

Synonyms: *Arrhenatheretum-Urtica dioica* subcommunity Rodwell & al. 1992.

Distribution: West and Central Europe.

Annex 1. Continuation.**Plant community *Festuca arundinacea*-*Arrhenatherum* sensu Rodríguez-Rojo & al. 2017**

Synonyms: *Arrhenatheretum festucetosum arundinaceae* Zuidhoff & al. 1996.

Distribution: West and Central Europe.

References: Rodríguez-Rojo & al. (2017).

Associations subordinated to *Arrhenatheretalia elatioris*, but information of alliance relation not found

Remarks: The following association are pointed to belong to alliances *Cynosurion* R. Tx. 1947 and *Festucion pratensis* Sipaylova & al. 1985.

Ass. *Festucetum ovinae* Turubanova 1986

Distribution: Russia (Komi Republic).

Ass. *Festuceto pratensis*-*Dactyletum glomeratae* Dymina in Korolyuk & Kiprijanova 1998

Distribution: Russia (Komi Republic).

Ass. *Equiseto arvensis*-*Elytrigietum repentis* Maraculina 2009

Distribution: Russia (Komi Republic).

Ass. *Amorio repens*-*Poetum pratensis* sensu Shushpannikova & Yamalov 2014

Distribution: Russia (Komi Republic).

References: Shushpannikova & Yamalov (2014).

Plant communities without rank nor any alliance relation, subordinated straight to *Arrhenatheretalia elatioris***Plant community *Potentilla erecta*-*Festuca rubra* sensu Becker & Becker 2010**

Distribution: Germany.

Variations: var. *Betonica officinalis*; var. *Trisetum flavescens*.

Plant community *Agrostis vinealis* sensu Shushpannikova & Yamalov 2014

Distribution: Russia (Komi Republic).

Plant community *Hypericum maculatum*-*Phleum pratense* sensu Shushpannikova & Yamalov 2014

Distribution: Russia (Komi Republic).

References: Becker & Becker (2010); Shushpannikova & Yamalov (2014).

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