

Vegetation of Croatia: Phytosociological classification of the high-rank syntaxa

Željko Škvorc^{1*}, Nenad Jasprica², Antun Alegro³, Sanja Kovačić⁴, Jozo Franjić¹, Daniel Krstonošić¹, Ana Vraneša⁵, Andraž Čarni⁶

¹ University of Zagreb, Faculty of Forestry, Svetošimunska 25, HR-10000 Zagreb, Croatia.

² University of Dubrovnik, Institute for Marine and Coastal Research, Kneza Damjana Jude 12, HR-20000 Dubrovnik, Croatia.

³ University of Zagreb, Faculty of Science, Department of Biology, Division of Botany, Marulićev trg 20/II, HR-10000 Zagreb, Croatia.

⁴ University of Zagreb, Faculty of Science, Department of Biology, Botanical Garden, Marulićev trg 9a, HR-10000 Zagreb, Croatia.

⁵ Ministry of Culture of the Republic of Croatia, Runjaninova 2, HR-10000 Zagreb, Croatia.

⁶ Scientific Research Center of the Slovenian Academy of Sciences and Arts, Institute of Biology, Novi trg 2, SI-1000 Ljubljana, Slovenia.

Abstract – Croatia is among the most ecologically diverse and floristically rich countries in Europe, with a great variety of communities. The vegetation elaboration according to the standard central European method was initiated in Croatia at the beginning of the 20th century. In previous overviews of Croatian vegetation, the number of classes and alliances was underrepresented in relation to the country's floristic richness. Furthermore, the level of knowledge and the amount of available data varied greatly among the various types of vegetation. The aims of this paper are mainly to compile a stabile syntaxonomic list of classes, orders and alliances dominated by vascular plants in Croatia and to adjust Croatian vegetation to the new European syntaxonomic system (EuroVegChecklist). It introduces a consistent description of high-rank syntaxa in Croatian. In conclusion, the vegetation of Croatia comprises 66 classes, 121 orders and 201 alliances. The number of syntaxa shows vegetation diversity that is rather high compared to most other European countries; this is related to the high floristic richness and endemism. The list points out the obvious problems and gaps in our knowledge of vegetation in Croatia and can serve as a baseline for the future vegetation studies.

Keywords: Braun-Blanquet approach, phytosociology, syntaxonomy, vegetation

Introduction

Croatia, extending from the Adriatic Sea over the Dinaric Alps toward the Pannonian plain, is among the floristically richest countries in Europe and one of the hotspots of European biodiversity (Nikolić 2001, Nikolić et al. 2014). This floristic and ecological richness, resulting in a great variety of communities, has always attracted research. Beck-Mannagetta (1901) and Adamović (1909) were the first botanists systematically to study the vegetation, and published extensive monographs based on the physiognomic-ecological approach.

The vegetation elaboration according to the standard central European method was initiated at the beginning of the 20th century (Braun-Blanquet 1921). Shortly thereafter research according to this method began in Croatia as well

(Pevalek 1924, Horvat 1925, Horvatić 1927) and the new approach was widely accepted among botanists. Since then, many researchers have elaborated the vegetation of Croatia, providing the extensive results that enabled the preparation of this overview. The level of knowledge and the amount of available data varies greatly among the various types of vegetation. For example, forest vegetation was investigated and documented to a greater extent. The first reviews of forest vegetation appeared in the works of Horvat (1937, 1938), and since then many comprehensive reviews have been published (e.g. Rauš et al. 1992, Vukelić et al. 2008, Vukelić 2012). Additionally, some of the most important vegetation research results in Croatia were published by Horvatić (1963), Marković-Gospodarić (1966), Ilijanić (1968), Šugar (1973), Šegulja (1976), Topić (1984), Trinajstić (1998, 2008) and Hulina (2002).

* Corresponding author, e-mail: zskvorc@sumfak.hr

To gain a comprehensive view of vegetation, botanists arrange complex vegetation patterns obtained from the field, in conceptually manageable and functionally logical units, called plant communities or vegetation types (Mucina et al. 2016). In this way, vegetation description and classification provides suitable objects for ecosystem research and inventory on a different scale. These objects are also used for the planning and managing of various conservation programs and the use of natural resources.

Due to the enormous complexity involved, there are many different approaches to vegetation classification (Peet and Roberts 2013). The most widely applied approach is based on total floristic composition of stands reflecting the environmental heterogeneity and biogeographic processes (the Braun-Blanquet approach), and it is developed within the framework of the scientific discipline called phytosociology. Phytosociology provides standardized protocols for vegetation sampling, description and delimitation of abstract vegetation types (syntaxa), and their hierarchical ordering into a practical and efficient framework (syntaxonomy) (Braun-Blanquet 1964, Westhoff and van der Maarel 1978, Dengler et al. 2008). The International Code of Phytosociological Nomenclature is a formal framework for the naming and organization of syntaxa (Weber et al. 2000).

Initial attempts to prepare an overview of syntaxa on a larger scale were made in the first half of the 20th century by Braun-Blanquet (1933) and Tüxen (1950, 1966), but the results were inadequate due to the lack of data. As vegetation scientists have been following this approach for decades, an enormous amount of phytosociological data has accumulated. In the last two decades, new syntaxonomic overviews have appeared for almost all European countries (Jiménez-Alfaro et al. 2014) and many efforts have been made to unify the classification system of European vegetation (Mucina 1997, Rodwell et al. 2002). Recently, finally, the first comprehensive and consistent syntaxonomic system of alliances, orders and classes for vascular plants, bryophytes and lichens, as well as for the algal communities of Europe has been established (Mucina et al. 2016).

The first overview of Croatian vegetation was published by Horvat (1942), followed by that of Trinajstić and Šugar (1976). In addition, the vegetation of Croatia has also been included within the review of ex-Yugoslav (Zupančič et al. 1986) or Southeast-European vegetation (Horvat et al. 1974). The latest and most comprehensive overview of Croatian vegetation was given by Trinajstić (2008), who reported 407 associations, 121 alliances, 66 orders and 42 classes. However, according to Jiménez-Alfaro et al. (2014), the number of classes and alliances in Trinajstić (2008) was underrepresented when compared with the country's actual floristic richness.

The vegetation of Croatia has been intensively studied during the last decade and many new syntaxonomical contributions have been published. Therefore, the aims of this paper are: 1) to compile a stabile syntaxonomic list of classes, orders and alliances dominated by vascular plants in Croatia, 2) to adjust the Croatian vegetation survey to the new European syntaxonomic system (Mucina et al. 2016), 3) to introduce a consistent description of classes, orders

and alliances in Croatian, and 4) to point out the obvious problems and gaps in our knowledge of the vegetation of Croatia.

Methods

The syntaxonomical scheme and nomenclature of all syntaxa follows the EuroVegChecklist (Mucina et al. 2016). Classes are grouped into broad informal groups according to Mucina (2013) and Mucina et al. (2016).

The baselines for the preparation of this paper were data originating from Trinajstić (2008) and Vukelić (2012) and references therein. In addition, the paper includes vegetation types reported in different sources, as well as those occurring in Croatia according to our own knowledge and experience. Vegetation types indicated by an asterisk (*) probably do occur in Croatia, but to confirm their presence and distribution further research is needed. Additional comments are included in the descriptions of vegetation types in the cases of: (1) different opinions on their syntaxonomy, (2) significant differences compared to the previous syntaxonomic treatment in Croatian phytosociological literature.

The EuroVegChecklist provides brief text descriptions for all included syntaxa which contain the physiognomy of the vegetation classified within the given unit, their unifying ecological context, and their distribution (Mucina et al. 2016). These original descriptions have been retained in the list with short descriptions in Croatian added.

Only synonyms that have been frequently used in the Croatian literature are listed. Each alliance was associated by the EUNIS habitat code, according to Schaminée et al. (2012), adjusted for Croatian territory.

This paper does not provide a compilation of all the phytosociological literature references in Croatia, because they have been already listed in Trinajstić (2008) and Vukelić (2012). Therefore, only references directly used during the preparation of this paper are listed.

Results and discussion

According to our estimations, the vegetation of Croatia comprises 66 classes, 121 orders and 201 alliances (see Appendix). The number of syntaxa shows that the vegetation diversity of Croatia is high compared to most European countries (Jiménez-Alfaro et al. 2014), which is related to the high floristic richness and endemism (Nikolić 2001, Nikolić et al. 2014), in common with other Mediterranean countries (e.g. Spain, Italy and France, Jiménez-Alfaro et al. 2014). The total floristic composition reflects the biogeography, environmental heterogeneity and, consequently, vegetation diversity of the region. European countries with two biogeographical regions (Eurosiberian and Mediterranean) have the greatest vegetation richness in relation to their size (Izco and Amigo 2011).

This paper lists 24 classes, 55 orders and 80 alliances more than were previously noted by Trinajstić (2008). This discrepancy can be explained at least partly by the insufficient elaboration of certain vegetation types and/or regions

of Croatia, since vegetation research was based mostly on the preference of particular researchers, institutions or projects. For example, for *Robinietaea*, *Sedo-Scleranthetea*, *Montio-Cardaminetea* and *Hypno cupressiformi-Polypodietaalia vulgaris* there were few or no literature data. Therefore, this paper may serve as a guideline for further studies, with the aim of better elaborating less known vegetation types in Croatia.

The other reason for the discrepancy in number of previously published syntaxa can be found in the different nomenclatural concepts applied. For example, the syntaxonomy of tall-herb vegetation (*Mulgedio-Aconitetea*) and zonal Mediterranean forests and scrubs differs greatly from that given in Trinajstić (2008) and Vukelić (2012). Furthermore, intrazonal Mediterranean grasslands and herblands have been classified in a larger number of syntaxa than in Horvatić (1963) and Trinajstić (2008).

From our own experience, the 17 alliances marked with an asterisk (*) probably are present in Croatia, but due to the lack of relevant vegetation data their occurrence is unconfirmed. Therefore, further research is needed. Likewise, it would be necessary better to define the syntaxonomy of several other vegetation types with different opinions on their syntaxonomical treatment (e.g. *Alno glutinosae-Populetea albae*).

References

Adamović, L., 1909: Die Vegetationsverhältnisse der Balkanländer. In: Engler, A., Drude, O. (eds.), Die Vegetation der Erde. Sammlung pflanzengeographischer Monographien. Vol. 11. Leipzig: Wilhelm Engelmann.

Beck-Mannagetta, G., 1901: Die Vegetationsverhältnisse der illyrischen Länder. Leipzig.

Braun-Blanquet, J., 1921: Prinzipien einer Systematik der Pflanzengesellschaften auf floristischer Grundlage. Jahrbuch der St. Gallischen Naturwissenschaftlichen Gesellschaft 57, 305–351.

Braun-Blanquet, J., 1933: Prodrome des groupements végétaux. Fasc. 1. Ammophiletalia et Salicornietalia méditerranéens. Mari-Lavit, Montpellier.

Braun-Blanquet, J., 1964: Pflanzensoziologie. 3rd ed., Springer-Verlag, Wien.

Dengler, J., Chytrý, M., Ewald, J., 2008: Phytosociology. In: Jørgensen, S. E., Fath, B. D. (eds.), Encyclopedia of Ecology. Vol. 4. General Ecology, Elsevier, Oxford.

Horvat, I., 1925: About the Plješevica vegetation in Lika. Geografski vestnik 1, 114–123 (in Croatian).

Horvat, I., 1937: Overview of forest vegetation of Croatia. Šumarski list 61, 337–344 (in Croatian).

Horvat, I., 1938: Phytosociological research of forests in Croatia. Glasnik za šumske pokuse 6, 127–279 (in Croatian).

Horvat, I., 1942: Plants of Croatia. Zemljopis Hrvatske 2, Zagreb, 1–101 (in Croatian).

Horvat, I., Glavač, V., Ellenberg, H., 1974: Vegetation Südosteuropas. Gustav Fischer Verlag, Jena.

Horvatić, I., 1927: Flora and vegetation of Plavnik island. Acta Botanica Croatica 2, 1–56 (in Croatian).

Horvatić, S., 1963: Phytogeographical position and division of the easternadriatic coastland in the light of the newest phytosociological studies. Acta Botanica Croatica 22, 27–81 (in Croatian).

The need for further comprehensive vegetation studies is evident also from the treatment of ruderal vegetation which is here represented by 34 alliances, in contrast to 22 alliances in Trinajstić (2008). These vegetation types have been intensively studied in the past (Marković-Gospodarić 1966, Marković 1984, 1992, Topić 1984, Hulina 2002, Pandža et al. 2005), but such discrepancies in the number of alliances indicates the need for new field research and synthesis.

In sum, this paper harmonizes the classification of Croatian vegetation with the EuroVegChecklist (Mucina et al. 2016) in order to meet the common European standards. Nevertheless, the classification of vegetation could have been done by using a different approach. With this in mind, the applied syntaxonomic concept represents just one view on this subject. However, it is a baseline for future syntaxonomic analyses that will result in a complete elaboration of Croatian vegetation based on relevé-databases and numerical techniques.

Acknowledgements

The authors thank Steve Latham (UK) for improving the English.

Hulina, N., 2002: Contribution to the knowledge of segetal vegetation of Croatia. Hacquetia 1, 205–208.

Izco, J., Amigo, J., 2011: Syntaxonomical diversity: relationships between syntaxa richness and area. Plant Biosystems 145, 38–45.

Jiménez-Alfaro, B., Chytrý, M., Rejmanek, M., Mucina, L., 2014: The number of vegetation types in European countries: major determinants and extrapolation to other regions. Journal of Vegetation Science 25, 863–872.

Ilijanić, Lj., 1968: Die Ordnung *Molinietalia* in der Vegetation Nordostkroatiens. Acta Botanica Croatica 26/27, 161–180.

Marković, Lj., 1984: Ruderal vegetation of Gorski kotar. Acta Botanica Croatica 43, 257–272 (in Croatian).

Marković, Lj., 1992: Die Vegetation des Verbandes *Alliarion* in Kroatien. Acta Botanica Croatica 46, 73–77.

Marković-Gospodarić, Lj., 1966: Contribution to the knowledge of the Ruderal vegetation of continental Croatia. Acta Botanica Croatica 24, 91–136 (in Croatian).

Mucina, L., 1997: Conspectus of classes of European vegetation. Folia Geobotanica et Phytotaxonomica 32, 117–172.

Mucina, L., 2013: Europe, Ecosystems of. In: Levin, S. A. (ed.), Encyclopaedia of Biodiversity, 2nd ed. Volume 3, Academic Press, Waltham.

Mucina, L., Bültmann, H., Dierßen, K., Theurillat, J.-P., Dengler, J., Čarni, A., Šumberová, K., Raus, T., Di Pietro, R., Gavilan García, R., Chytrý, M., Iakushenko, D., Schaminée, J. H. J., Bergmeier, E., Santos Guerra, A., Daničels, F. J. A., Ermakov, N., Valachovic, M., Pignatti, S., Rodwell, J. S., Pallas, J., Capelo, J., Weber, H. E., Lysenko, T., Solomesh, A., Dimopoulos, P., Aguiar, C., Freitag, H., Hennekens, S. M., Tichý, L., 2016: Vegetation of Europe: Hierarchical floristic classification system of plant, lichen, and algal communities. Applied Vegetation Science 19, 3–264.

Nikolić, T., 2001: The diversity of Croatian vascular flora based on the Checklist and CROFlora database. Acta Botanica Croatica 60, 49–67.

- Nikolić, T., Mitić, B., Ruščić, M., Milašinović, B., 2014: Diversity, knowledge and spatial distribution of the vascular flora of Croatia. *Plant Biosystems* 148, 591–601.
- Pandža, M., Franjić, J., Škvorc, Ž., 2005: Weed and ruderal vegetation (*Stellarietea mediae* R. Tx. et al. ex von Rochow 1951) in the central part of the East Adriatic coast. *Periodicum Biologorum* 107, 361–372.
- Peet, R. K., Roberts, D. W., 2013: Classification of natural and semi-natural vegetation. In: van der Maarel, E., Franklin, J. (eds.), *Vegetation ecology*, 2nd ed. Wiley-Blackwell, Chichester.
- Pevalek, I., 1924: Geobotanical and algological investigations of bogs in Croatia and Slovenia. *Rad Jugoslavenske akademije* 230, 29–117 (in Croatian).
- Rauš, Đ., Trinajstić, I., Vukelić, J., Medvedović, J., 1992: Plants of Croatian forests. In: Rauš, Đ. (ed.), *Forests of Croatia*, 33–77. Šumarski fakultet Sveučilišta u Zagrebu, JP Hrvatske šume p. o., Zagreb (in Croatian).
- Rodwell, J.S., Schaminée, J.H.J., Mucina, L., Pignatti, S., Dring, J., Moss, D., 2002: The Diversity of European Vegetation: An overview of phytosociological alliances and their relationships to EUNIS habitats. National Reference Centre for Agriculture, Nature and Fisheries, Wageningen.
- Schaminée, J.H.J., Chytrý, M., Hennekens, S.M., Mucina, L., Rodwell, J.S., Tichý, L., 2012: Development of vegetation syntaxa crosswalks to EUNIS habitat classification and related data sets. European Environmental Agency, Copenhagen.
- Šegulja, N., 1976: The vegetation of the orders *Isoëtetalia* and *Magnocaricetalia* in the area of Vukomeričke gorice. *Acta Botanica Croatica* 35, 143–151 (in Croatian).
- Škvorc, Ž., Franjić, J., Krstonošić, D., Sever, K., Alešković, I., 2011: Vegetation features of beech forests of Psunj, Papuk and Krndija mountains. *Croatian Journal of Forest Engineering* 32, 157–176 (in Croatian).
- Šugar, I., 1973: Two new plant communities in Samobor mountains. *Acta Botanica Croatica* 32, 197–202 (in Croatian).
- Topić, J., 1984: Phytocenological and phytogeographical characteristics of the hoe weed vegetation in the continental part of Croatia. *Acta Botanica Croatica* 43, 273–284.
- Tüxen, R., 1950: Grundriß einer Systematik der nitrophilen Unkrautgesellschaften in der Eurosibirischen Region Europas. *Mitteilungen der Floristisch-Soziologischen Arbeitsgemeinschaft N.F. 2*, 94–175.
- Tüxen, J., 1966: Kurze Übersicht über die derzeitige systematische Gliederung der Acker- und Ruderal-Gesellschaften Europas. In: Tüxen, R. (ed.), *Anthropogene vegetation*, 75–82. Dr W Junk, Den Haag.
- Trinajstić, I., 1998: Plantgeographical division of climazonal forest vegetation of Croatia. *Šumarski list* 122, 407–421 (in Croatian).
- Trinajstić, I., 2008: Plant communities of Croatia. *Akademija šumarskih znanosti, Zagreb* (in Croatian).
- Trinajstić, I., Šugar, I., 1976: Prodrum of plant communities of Croatia. Institut za botaniku Sveučilišta u Zagrebu (in Croatian).
- Vukelić, J., 2012: Forest vegetation of Croatia. Šumarski fakultet Sveučilišta u Zagrebu, Državni zavod za zaštitu prirode, Zagreb (in Croatian).
- Vukelić, J., Mikac, S., Baričević, D., Bakšić, D., Rosavec, R., 2008: Forest Sites and Forest Communities in Croatia. National Ecological Network. Državni zavod za zaštitu prirode RH, Zagreb.
- Weber, H.E., Moravec, J., Theurillat, J.-P., 2000: International code of phytosociological nomenclature. 3rd edition. *Journal of Vegetation Science* 11, 739–768.
- Westhoff, V., van der Maarel, E., 1978: The Braun-Blanquet approach. In: Whittaker, R.H. (ed.) *Classification of vegetation*, 287–399. Dr W. Junk, The Hague, NL.
- Zupančić, M., Jovanović, B., Lakušić, R., Rizovski, R., Trinajstić, I. (eds.) 1986: Prodrum phytocoenosis Jugoslaviae. *Ad mappam vegetationis M 1:200 000*. Bribir-Ilok.

Appendix. Vegetation list

Remarks to the syntaxa descriptions (in Croatian)

Napomene uz opise sintaksona na hrvatskom jeziku

Svakom ovdje navedenom sintaksonu uz izvorne opise na engleskom jeziku dodijelili smo i hrvatske nazive, pri čemu smo u najvećoj mjeri nastojali preuzeti postojeću domaću terminologiju koja je tijekom prošlog stoljeća korištena pri imenovanju vegetacijskih tipova. U slučajevima kada se unutar višeg sintaksona nalazi samo jedan niži sintakson, hrvatski naziv nižeg sintaksona jednak je nazivu višeg. Kada se u nazivu navodi fitogeografski položaj sintaksona koristili smo pojmove „sredozemni” i „kontinentalni”. Pri tome se „sredozemni” odnosi na cijelu mediteransku vegetacijsku regiju unutar koje smo razlikovali submediteransko i primorsko područje. Korištena je i uobičajena neformalna botanička podjela zeljastih biljaka na jednogodišnje, dvogodišnje i trajnice te na zeleni i trave, pri čemu su „zeleni” zeljaste biljke širokih listova (biljke koje nemaju graminoidne listove).

1. ZONAL AND INTRAZONAL VEGETATION

Zonalna i intrazonalna vegetacija

1.1. VEGETATION OF THE BOREAL ZONE

Vegetacija borealne zone

1.1.1. ZONAL BOREAL AND HEMIBOREAL FORESTS

Zonalne borealne i hemiborealne šume

PIC *Vaccinio-Piceetea* Br.-Bl. in Br.-Bl. et al. 1939

Gorske i pretplaninske šume smreke i jele

Holarctic coniferous and boreo-subarctic birch forests on oligotrophic and leached soils in the boreal zone and at high-altitudes of mountains in the nemoral zone of Eurasia

PIC-01 *Piceetalia excelsae* Pawłowski et al. 1928 (syn. *Vaccinio-Piceetalia excelsae* Br.-Bl. in Br.-Bl. et al. 1939)

Acidofilne gorske i pretplaninske šume smreke i jele na siromašnim tlima

European boreo-montane and subalpine spruce and pine forests on nutrient-poor soils

PIC-01A *Piceion excelsae* Pawłowski et al. 1928 (syn. *Vaccinio-Piceion excelsae* Br.-Bl. in Br.-Bl. et al. 1939) – EUNIS G3.1

Acidofilne gorske i pretplaninske šume smreke i jele na siromašnim tlima

European boreo-montane spruce forests and subalpine open pine woods on nutrient-poor podzolic soils

PIC-06 *Athyrio filicis-feminae-Piceetalia* Hadač in Hadač et al. 1969

Gorske i pretplaninske šume smreke i jele na bogatim tlima
European boreo-montane spruce, fir and pine forests on nutrient-rich soils

PIC-06A *Chrysanthemo rotundifolii-Piceion* (Krajina 1933) Březina et Hadač in Hadač 1962 – EUNIS G3.1

Pretplaninske šume smreke na bogatim tlima

Mesic herb-rich spruce forests of the Central and Northern European mountains

PIC-06B *Abieti-Piceion* (Br.-Bl. in Br.-Bl. et al. 1939) Soó 1964 – EUNIS G3.1

Gorske šume smreke na bogatim tlima

Mesophilous fir forests on brown forest soils of the Central and southwestern European mountains

PIC-06C *Calamagrostio-Abietion* Horvat 1962 *nom. invers. propos.* – EUNIS G3.1

Šume jele na vapnenačkim stijenama i blokovima

Mesic herb-rich fir forests on limestone and dolomite boulder screes in the montane and subalpine belts of the Western Balkans

BRA *Brachypodio pinnati-Betuletea pendulae* Ermakov et al. 1991

Šume breze

Hemiboreal pine and birch-pine herb-rich open forests on fertile soils of the Southern Urals and Southern Siberia, and relict birchpoplar forests of Europe

BRA-02 *Fragario vescae-Populetales tremulae* Willner et Mucina in Willner et al. 2016 *nom. inval.*

Šume breze

Relict extrazonal temperate deciduous birch-poplar woods on mineral soils of Europe

Comment: This order comprises natural pioneer and secondary birch-poplar woods (Willner et al. 2016). In Croatian literature this communities were elaborated within *Quercetalia roboris* Tx. 1931 (Trinajstić 2008, Vukelić et al. 2012).

BRA-02A *Fragario vescae-Populion tremulae* Willner et Mucina *ined.* – EUNIS G1.9

Šume breze

Relict extrazonal temperate deciduous birch-poplar woods on mineral soils of Europe

1.2. VEGETATION OF THE NEMORAL FOREST ZONE

Vegetacija šumske zone umjerenih područja

1.2.1. ZONAL TEMPERATE BROAD-LEAVED FORESTS

Zonalne listopadne šume umjerenih područja

FAG *Carpino-Fagetea sylvaticae* Jakucs ex Passarge 1968 (syn. *Quercus-Fagetea sylvaticae* Br.-Bl. et Vlieger in Vlieger 1937)

Mezofilne listopadne i mješovite šume

Mesic deciduous and mixed forests of temperate Europe, Anatolia, the Caucasus and Southern Siberia

FAG-01 *Luzulo-Fagetalia sylvaticae* Scamoni et Passarge 1959

Acidofilne šume bukve

Acidophilous beech and mixed fir-beech forests on nutrient-poor soils in the nemoral zone of temperate Europe and as relicts at high altitudes of Corsica

FAG-01A *Luzulo-Fagion sylvaticae* Lohmeyer et Tx. in Tx. 1954 – EUNIS G1.6

Acidofilne šume bukve

Acidophilous beech and mixed fir-beech forests of Central Europe

FAG-02 *Fagetalia sylvaticae* Pawlowski 1928

Neutrofilne i bazofilne šume bukve i šume bukve i jele

Basiphilous beech and mixed fir-beech forests in the nemoral zone and in the montane belt of the submediterranean regions of temperate Europe

FAG-02A *Aremonio-Fagion* (Horvat 1950) Borhidi in Török et al. 1989 – EUNIS G1.6

Ilirske neutrofilne i bazofilne šume bukve i šume bukve i jele

Refugial basiphilous beech and mixed fir-beech forests of the northwestern Balkans and the Eastern Alps

FAG-02B *Fagion sylvaticae* Luquet 1926 – EUNIS G1.6

Srednjoeuropske neutrofilne i bazofilne šume bukve

Partly refugial post-glacial basiphilous beech and mixed fir-beech forests of the temperate Europe

FAG-03 *Carpinetalia betuli* P. Fukarek 1968

Šume kitnjaka i običnog graba

Oak-hornbeam and mesic oak forests on deep nutrient-rich soils of the temperate Europe

FAG-03A *Carpinion betuli* Issler 1931 – EUNIS G1.A

Srednjoeuropske šume kitnjaka i običnog graba

Oak-hornbeam forests on deep nutrient-rich soils of Central and Eastern Europe

FAG-03C *Erythronio-Carpinion* (Horvat 1958) Marinček in Wallnöfer et al. 1993 – EUNIS G1.A

Ilirske šume kitnjaka i običnog graba

Oak-hornbeam forests on deep nutrient-rich soils of the Balkans and Northern Italy

FAG-05 *Aceretalia pseudoplatani* Moor 1976 *nom. conserv. propos.*

Šume plemenitih listača

Scree and ravine maple-lime forests of the nemoral zone of the temperate Europe

***FAG-05A *Tilio-Acerion Klika* 1955 – EUNIS G1.A**

Srednjoeuropske mezofilne šume plemenitih listača

Sycamore maple forests in the montane belt and cool ravines of the Central European mountain ranges

***FAG-05B *Melico-Tilion platyphylli* Passarge et G. Hofmann 1968 – EUNIS G1.A**

Srednjoeuropske termofilne šume plemenitih listača

Thermophilous lime forests on scree slopes at low altitudes of the southern regions of Central Europe

FAG-05D *Fraxino excelsioris-Acerion pseudoplatani* P. Fukarek 1969 – EUNIS G1.A

Ilirske mezofilne šume plemenitih listača

Submediterranean mesophilous broad-leaved ash-maple scree and ravine forests of the Balkan Peninsula

FAG-05E *Ostryo carpinifoliae-Tilion platyphylli* (Košir et al. 2008) Čarni in Willner et al. 2016 – EUNIS G1.A

Ilirske kserotermofilne šume plemenitih listača

Submediterranean xero-thermophilous broad-leaved scree and ravine forests of the Balkan Peninsula

PUB *Quercetea pubescentis* Doing-Kraft ex Scamoni et Passarge 1959*Termofilne šume listopadnih hrastova*

Oak, mixed deciduous and conifer open forests of warm regions in the cool-temperate nemoral zone of Central and Southern Europe and in the supramediterranean belt of the Mediterranean, Asia Minor and Middle East

PUB-01 *Quercetalia pubescenti-petraeae* Klika 1933*Termofilne šume listopadnih hrastova*

Oak forests of the warm cool-temperate regions in the nemoral zone of Central and Southern Europe and relic supramediterranean fir-pine and oak forests of the Mediterranean

PUB-01A *Quercion petraeae* Issler 1931 – EUNIS G1.7, G1.8*Srednjoeuropske acidotermofilne šume listopadnih hrastova*

Thermophilous Central European acidophilous oak forests

PUB-01B *Quercion pubescenti-petraeae* Br.-Bl. 1932 *nom. mut.* – EUNIS G1.7*Srednjoeuropske termofilne kalcifilne šume listopadnih hrastova*

Thermophilous Central European calciphilous oak forests

PUB-01C *Aceri tatarici-Quercion Zólyomi* 1957 – EUNIS G1.7*Termofilne panonske šume hrastova na lesu*

Thermophilous oak forests on deep soils in the forest-steppe zone of the Pontic-Pannonian region

PUB-01F *Fraxino orni-Ostryion Tomažič* 1940 – EUNIS G1.7*Šume crnog graba i medunca*

Amphiadriatic mesic calcareous submediterranean (sub)montane and inland oak and hop-hornbeam forests on shallow soils

Comment: In Croatian literature all thermophilous pubescent oak forests were elaborated within *Ostryo-Carpinion orientalis* Horvat 1959 (Trinajstić 2008, Vukelić et al. 2012). In this paper two alliances differ within this complex – *Fraxino orni-Ostryion* Tomažič 1940 and *Carpinion orientalis* Horvat 1958 (Čarni et al. 2009, Mucina et al. 2016), wherein *Ostryo-Carpinion orientalis* Horvat 1959 is a synonym of *Fraxino orni-Ostryion* Tomažič 1940

PUB-01G *Carpinion orientalis* Horvat 1958 – EUNIS G1.7, F5.3*Submediteranske šume medunca i bijelog graba*

Amphiadriatic low-altitude calcareous thermophilous oak and oriental hornbeam forests

PUB-01N *Quercion confertae* Horvat 1958 – EUNIS G1.7*Termofilne šume sladuna*

Thermophilous deciduous oak forests on slightly acidic deep soils of the Central Balkans

PUB-01O *Quercion petraeo-cerridis* Lakušić et B. Jovanović in B. Jovanović et al. ex Čarni et Mucina 2015 – EUNIS G1.7Termofilne šume cera i kitnjaka*

Thermophilous montane oak forests of the Central Balkans.

QUE *Quercetea robori-petraeae* Br.-Bl. et Tx. ex Oberd. 1957*Acidofilne šume kitnjaka i pitomog kestena*

Acidophilous oak and oak-birch forests on nutrient-poor soils of Europe

QUE-01 *Quercetalia roboris* Tx. 1931 (syn. *Quercetalia robori-sessiliflorae* Tx. 1937)*Acidofilne šume kitnjaka i pitomog kestena*

Acidophilous oak forests on nutrient-poor soils of Europe

QUE-01C *Agrostio-Quercion petraeae* Scamoni et Passarge 1959 (syn. *Genisto germanicae-Quercion* Neuhäusl et Neuhäuslová-Novotná 1967) – EUNIS G1.8*Acidofilne šume kitnjaka*

Temperate acidophilous oak forests on nutrient-poor soils of Central and Eastern Europe

Comment: In Croatian literature these forests were elaborated within *Quercion roboris* Malcuit 1929 (*Quercion robori-sessiliflorae* Br.-Bl. 1932; Trinajstić 2008, Vukelić 2012). However, this alliance comprises temperate atlantic and subatlantic acidophilous oak forests on nutrient-poor soils of Western Europe (Mucina et al. 2016).

QUE-01E *Castaneo-Quercion petraeae* Soó 1964 – EUNIS G1.8*Acidofilne šume kitnjaka i pitomog kestena*

Acidophilous chestnut-oak forests on nutrient-poor soils of the southeastern Europe

1.2.2. INTRAZONAL SCRUB OF THE NEMORAL ZONE

Intrazonalne šikare šumske zone umjerenih područja

RHA *Crataego-Prunetea* Tx. 1962 *nom. conserv. propos.* (syn. *Rhamno-Prunetea* Rivas Goday et Borja Carbonell 1961)*Živice, šikare i šumski rubovi*

Scrub and mantle vegetation seral or marginal to broad-leaved forests in the nemoral zone and the submediterranean regions of Europe

RHA-01 *Prunetalia spinosae* Tx. 1952*Kontinentalne živice, šikare i šumski rubovi*

Scrub and mantle vegetation seral or marginal to broad-leaved forests in the nemoral zone of Europe

RHA-01A *Berberidion vulgaris* Br.-Bl. ex Tx. 1952 *nom. conserv. propos.* – EUNIS F3.1, F3.2*Termofilne živice, šikare i šumski rubovi*

Southern temperate and submediterranean thermophilous scrub of Southern and Central Europe

RHA-01E *Astrantio-Corylion avellanae* Passarge 1978 – EUNIS F3.1*Šikare lijeske u brdskom i gorskom pojasu*

Hazel scrub on nutrient-rich soils in the submontane and montane belts of Western, Central and southeastern Europe

RHA-01F *Pruno-Rubion radulae* Weber 1974 – EUNIS F3.1*Mezofilne srednjoeuropske živice, šikare i šumski rubovi*

Bramble scrub on neutral and base-rich soils of Western and Central Europe

RHA-01I *Brachypodio pinnati-Juniperion communis* Mucina in Mucina et al. 2016 – EUNIS F3.1, F3.2*Termofilne šikare obične borovice na vapnenačkoj podlozi*

Low-altitude thermophilous juniper scrub on calcareous substrates of Western and Central Europe

RHA-01J *Prunion fruticosae* Tx. 1952 – EUNIS F3.1

Mezofilne panonske živice, šikare i šumski rubovi
Subcontinental and continental scrub in the forest-steppe and steppe zones of Central and Eastern Europe

RHA-02 *Paliuretalia Trinajstić* 1978

Submediteranske živice, šikare i šumski rubovi
Thermophilous mantle, pseudomaquis and šibljak fringing oak forests of the submediterranean regions of southeastern Europe

***RHA-02C *Fraxino orni-Cotinion* Soó 1960** – EUNIS F3.2

Panonske kserotermofilne živice, šikare i šumski rubovi
Thermophilous mantle vegetation of the Southern Pannonian oak forests

Comment: This vegetation type is extrazonal submediterranean vegetation of the southern Pannonian plain.

RHA-02E *Paliuro-Petterion* P. Fukarek 1962 (syn. *Paliurion adriaticum* Trinajstić 1977, *Rhamno intermediae-Paliurion spinae-christi* Trinajstić /1978/ 1996) – EUNIS F3.2

Dračici

Submediterranean thermophilous šibljak of the eastern Adriatic seaboards of the Balkan Peninsula

ROB *Robinietaea Jurko ex Hadač et Sofron* 1980

Šumske sječine i antropogene šikare

Seral forest-clearing and anthropogenic successional scrub and thickets on nutrient-rich soils of temperate Europe

ROB-01 *Sambucetalia racemosae* Oberd. ex Doing 1962

Šumske sječine

Elder, willow and hazel scrub on nutrient-rich soils in forest clearings of temperate Europe

ROB-01A *Sambuco-Salicion capreae* Tx. et Neumann ex Oberd. 1957 – EUNIS F3.1, G5.2, G5.6, G5.8

Šumske sječine

Elder, willow and hazel scrub on nutrient-rich soils in forest clearings of temperate Europe

ROB-02 *Chelidonio-Robinietaea pseudoacaciae* Jurko ex Hadač et Sofron 1980

Antropogene šikare i šumarci

Subspontaneous anthropogenic scrub and low-grown forest groves

ROB-02A *Aegopodio podagrariae-Sambucion nigrae* Chytrý 2013 – EUNIS F3.1

Šikare bazge

Anthropogenic elder scrub in ruderal habitats of Western and Central Europe

ROB-02B *Balloto nigrae-Robinion pseudoacaciae* Hadač et Sofron 1980 – EUNIS G5.2

Kserofilne antropogene šikare i šumarci bagrema

Robinia groves with weedy understorey on loamy-sandy dry soils of Central and Eastern Europe

ROB-02C *Chelidonio majoris-Robinion pseudoacaciae* Hadač et Sofron ex Vitkováin Chytrý 2013 – EUNIS G5.2

Mezofilne antropogene šikare i šumarci bagrema

Robinia groves with weedy understorey on nutrient-rich mesic soils of Central and Eastern Europe

***ROB-02E *Chelidonio-Acerion negundo* L. Ishbirdin et A. Ishbirdin 1989** – EUNIS F3.1, G5.2

Antropogene šikare i šumarci negundovca

Subspontaneous groves and scrub of *Acer negundo* of Eastern Europe

1.2.3. INTRAZONAL BOREO-TEMPERATE GRASSLANDS AND HEATH

Intrazonalni travnjaci i vrištine borealnih i umjerenih područja

ULI *Calluno-Ulicetea* Br.-Bl. et Tx. ex Klika et Hadač 1944

Vrištine i acidofilne šikare obične borovice

Heath on acidic nutrient-poor soils in the lowland to montane belts of the temperate and boreal zones of Europe

ULI-02 *Vaccinio myrtilli-Genistetalia pilosae* Schubert ex Passarge 1964

Vrištine

Heath of cold-atlantic, subcontinental and subboreal and boreal regions of Western, Central and northeastern Europe and Scandinavia

ULI-02B *Calluno-Genistion pilosae* P. Duvigneaud 1945 (syn. *Genistion pilosae* Böcher 1943) – EUNIS F4.2

Vrištine

Low-altitude heath of the atlantic and subcontinental regions of temperate Europe

ULI-03 *Vaccinio-Juniperetalia communis* Passarge 1972

Acidofilne šikare obične borovice

Low-altitude acidophilous juniper scrub of temperate subatlantic regions of Europe

ULI-03A *Vaccinio-Juniperion communis* Passarge in Passarge et G. Hofmann 1968 – EUNIS F3.1

Acidofilne šikare obične borovice

Low-altitude acidophilous juniper scrub of temperate subatlantic regions of Europe

NAR *Nardetea strictae* Rivas Goday et Borja Carbonell in Rivas Goday et Mayor López 1966 nom. conserv. propos.

Travnjaci tvrdače na siromašnim tlima

Secondary mat-grass swards on nutrient-poor soils at low and mid-altitudes of the temperate, boreal and subarctic regions of Europe

NAR-01 *Nardetalia strictae* Preising 1950

Travnjaci tvrdače na siromašnim tlima

Secondary mat-grass swards on nutrient-poor soils at low and mid-altitudes of temperate, boreal and subarctic regions of Europe

NAR-01B *Violion caninae* Schwickerath 1944 – EUNIS E1.7, E5.3

Travnjaci tvrdače u nizinskom pojasu

Meso-subxerophytic oligotrophic pastures in the lowland to submontane belts of Western and Central Europe

NAR-01D *Nardo-Agrostion tenuis* Sillinger 1933 – EUNIS E1.7

Travnjaci tvrdače u pretplaninskom pojasu

Mat-grass dry pastures in the submontane to subalpine belts of the mountain ranges of Central Europe and the Northern Balkans

NAR-01H *Achilleo-Arnicion* Horvat et Pawlowski in Horvat 1960 (syn. *Calluno-Festucion capillatae* Horvat ex Horvat et al. 1974) – EUNIS E1.7

Travnjaci tvrdače u brdskom i gorskom pojasu

Oligotrophic pastures in the lowland to submontane belts of the Western Balkans

COR *Koelerio-Coryneporetea canescentis* Klika in Klika et Novák 1941

Panonski travnjaci na pješčanim tlima

Dry grasslands on sandy soils and on rocky outcrops of the temperate to boreal zones of Europe, the North Atlantic islands and Greenland

COR-02 *Festucetalia vaginatae* Soó 1957*Panonski travnjaci na pješčanim tlima*

European (sub)continental fescue sandy steppes in the forest-steppe and steppe zones of Europe

COR-02A *Festucion vaginatae* Soó 1929 – EUNIS E1.1*Panonski travnjaci na pješčanim tlima*

Pannonian subcontinental fescue sandy steppes

SED *Sedo-Scleranthetea* Br.-Bl. 1955*Pionirska vegetacija na plitkim i kamenitim tlima*

Pioneer vegetation on shallow soils on rocky siliceous outcrops on siliceous rocks of the temperate and boreal Europe

SED-03 *Thero-Airetalia* Rivas Goday 1964*Pionirska vegetacija na plitkim i kamenitim silikatnim tlima*

Pioneer vegetation on acidic shallow soils of the winter-mild atlantic and subboreal regions of Western Europe, the Northern Iberian Peninsula and Madeira

SED-03A *Thero-Airion* Tx. ex Oberd. 1957 – EUNIS E1.1, E1.9*Pionirska vegetacija na plitkim i kamenitim silikatnim tlima*

Pioneer vegetation on acidic shallow soils of the winter-mild atlantic and subboreal regions of Western Europe, the northern Iberian Peninsula and Madeira

SED-04 *Alyso-Sedetalia* Moravec 1967*Pionirska vegetacija na plitkim i kamenitim vapnenačkim tlima te bazičnim pijescima*

European temperate pioneer therophyte and stonecrop swards on calcareous shallow skeletal soils and base-rich sands

SED-04A *Alyso alyssoidis-Sedion* Oberd. et T. Müller in T. Müller 1961 – EUNIS E1.1, H3.6*Pionirska vegetacija na plitkim i kamenitim vapnenačkim tlima*

Thermophilous stonecrop vegetation on weathered calcareous rocks of temperate Europe

***SED-04H *Bassio laniflorae-Bromion tectorum* Borhidi 1996 nom. conserv. propos.** – EUNIS E1.1*Panonska pionirska vegetacija na bazičnim pijescima*

Pannonian annual open swards on base-rich sandy substrates

GER *Trifolio-Geranietea sanguinei* T. Müller 1962*Šumski rubovi s prevlašću visokih zeleni*

Thermophilous forest fringe and tall-herb vegetation in nutrient-poor sites in the submediterranean to subboreal zones of Europe and the Macaronesia

GER-01 *Origanetalia vulgaris* T. Müller 1962*Mezofilni šumski rubovi s prevlašću visokih zeleni*

Meso-subxerophytic fringe and tall-herb vegetation on nutrient-poor but base-rich soils of temperate and subboreal Europe

GER-01B *Trifolion medii* T. Müller 1962 – EUNIS E5.2*Mezofilni šumski rubovi s prevlašću visokih zeleni*

Meso-subxerophytic fringe vegetation on nutrient-poor but base-rich soils at lower altitudes of temperate Western and Central Europe

GER-02 *Antherico ramosi-Geranietalia sanguinei* Julve ex Dengler in Dengler et al. 2003*Termofilni šumski rubovi s prevlašću visokih zeleni*

Xerophilous fringe and tall-herb vegetation on nutrient-poor and base-rich soils in the submediterranean, temperate and subboreal zones of Europe

GER-02A *Geranion sanguinei* Tx. in T. Müller 1962 – EUNIS E5.2*Srednjoeuropski termofilni šumski rubovi s prevlašću visokih zeleni*

Xerophilous fringe and tall-herb vegetation of the subcontinental Western and Central Europe

GER-02C *Dictamno albi-Ferulagion galbaniferae* (van Gils et al. 1975) de Foucault et al. ex Čarni et Dengler in Mucina et al. 2009 – EUNIS E5.2*Ilirski termofilni šumski rubovi s prevlašću visokih zeleni*

Xerophilous fringe and tall-herb vegetation of the Illyrian and Dinaric regions of the Balkan Peninsula

GER-05 *Melampyro-Holcetalia mollis* Passarge in Theurillat et al. 1995*Acidofilni šumski rubovi s prevlašću visokih zeleni*

Meso-xerophytic fringe and tall-herb on acidic soils in the submediterranean to subboreal zones of Europe

GER-05A *Melampyrion pratensis* Passarge 1979 – EUNIS E5.2*Acidofilni šumski rubovi s prevlašću visokih zeleni*

Meso-xerophytic forest-edge communities on acidic soils in semi-shady to sunny habitats of temperate and (sub)boreal Europe

MOL *Molinio-Arrhenatheretea* Tx. 1937*Vegetacija travnjaka i visokih zeleni na dubokim tlima*

Anthropogenic managed pastures, meadows and tall-herb meadow fringes on fertile deep soils at low and mid-altitudes (rarely also high altitudes) of Europe

MOL-01 *Arrhenatheretalia elatioris* Tx. 1931*Mezofilne livade i pašnjaci*

Mown meadows and pastures on well-drained mineral soils at low and mid-altitudes of temperate and subboreal Europe

MOL-01A *Arrhenatherion elatioris* Luquet 1926 – EUNIS E2.2, E2.7*Mezofilne livade od nizinskog do brdskog pojasa*

Mesic mown meadows on mineral-rich soils in the lowland to submontane belts of temperate Europe

MOL-01B *Phyteumato-Trisetion* Ellmauer et Mucina 1993 – EUNIS E2.3*Mezofilne livade u brdskom i gorskom pojasu*

Mesic mown meadows on relatively mineral-poor soils in the submontane and montane belts of Central Europe

MOL-01C *Cynosurion cristati* Tx. 1947 – EUNIS E2.1, E2.6*Mezofilni pašnjaci*

Mesic pastures on well-drained mineral-rich soils at low to mid-altitudes of temperate Europe

MOL-01D *Alchemillo-Ranunculion repentis* Passarge 1979 – EUNIS E2.8*Slabo gaženi mezofilni travnjaci*

Slightly trampled herb-rich grasslands in shaded habitats of the temperate and subboreal regions of Europe

MOL-05 *Molinetalia caeruleae* Koch 1926*Vlažne livade*

Wet mown meadows on mineral and peaty soils in the temperate to subarctic zones of Europe

MOL-05A *Molinion caeruleae* Koch 1926 – EUNIS E3.5*Vlažne livade u nizinskom pojasu*

Mown meadows on temporarily wet soils at low altitudes of temperate Western and Central Europe

MOL-05B *Calthion palustris* Tx. 1937 – EUNIS E3.4
Vlažne livade s higrofilnim zelenima

Herb-rich temporarily wet mown meadows on mineral soils at low altitudes of suboceanic Western and subcontinental Central Europe

MOL-05D *Deschampsion caespitosae* Horvatić 1930 (syn. *Alopecurion pratensis* Passarge 1964) – EUNIS E3.4

Periodično vlažne nizinske livade na teškim tlima

Mown temporarily wet meadows on heavy soils on floodplains in the forest and forest-steppe zones of (sub)continental Central and Eastern Europe

MOL-06 *Trifolio-Hordeetalia* Horvatić 1963

Vlažni djetelinski travnjaci

Amphiadriatic wet meadows on gleyic soils of the river floodplains and karstic poljes of the Apennine and Balkan Peninsulas

MOL-06A *Molinio-Hordeion secalini* Horvatić 1934 (syn. *Alopecurion utriculati* Zeidler 1954) – EUNIS E3.3

Vlažni djetelinski travnjaci u krškim poljima

Vegetation of wet meadows of the submediterranean precipitation-rich regions of the Balkans

MOL-06D *Trifolion pallidi* Ilijanić 1969 – EUNIS E3.3

Kontinentalni vlažni djetelinski travnjaci

Vegetation of wet meadows of the subhumid continental regions of Northern Serbia

MOL-08 *Filipendulo ulmariae-Lotetalia uliginosi* Passarge 1975

Zajednice visokih zeleni uz rubove potoka i vlažnih travnjaka

Tall-herb wet meadow fringe vegetation on mineral soils of temperate Europe

MOL-08A *Filipendulo-Petasition* Br.-Bl. ex Duvi-gneaud 1949 – EUNIS E5.4

Zajednice visokih zeleni uz rubove potoka i vlažnih travnjaka u brdskom i gorskom pojasu

Tall-herb fringe wet meadow vegetation on neutral and slightly basic mineral soils in the submontane and montane belts of Western and Central Europe

MOL-08E *Mentho longifoliae-Juncion inflexi* T. Müller et Görs ex de Foucault 2009 – EUNIS D5.3, E3.4

Zajednice visokih zeleni uz rubove potoka i vlažnih travnjaka u nizinskom pojasu

Tall-herb temporarily flooded lightly-grazed nutrient-rich meadow fringes in riparian and alluvial habitats of temperate Europe

MOL-10 *Potentillo-Polygonetalia avicularis* Tx. 1947 (syn. *Agrostietalia stoloniferae* Oberd. in Oberd. et al. 1967)

Periodično plavljeni pašnjaci u nizinskom pojasu

Temporarily flooded and heavily grazed zoo-anthropogenic nutrient-rich meadows and pastures of the temperate and mediterranean regions of Europe

MOL-10A *Potentillion anserinae* Tx. 1947 – EUNIS E3.4

Periodično plavljeni pašnjaci u nizinskom pojasu

Temporarily flooded and heavily grazed nutrient-rich

pastures experiencing variable wet-dry or brackish-fresh alternating conditions of temperate Europe

Comment: The name *Agropyro-Rumicion crispi* Nordhagen 1940 has been used predominantly for inland communities of flooded pastures (e.g. Trinajstić 2008). However, *Agropyro-Rumicion crispi* Nordhagen 1940 as including very different communities of maritime strandline vegetation (Mucina et al. 2016).

1.2.4. VEGETATION OF THE NEMORAL OROSYSTEMS

Vegetacija orosustava u šumskoj zoni umjerenih područja

SAB *Junipero-Pinetea sylvestris* Rivas-Mart. 1965 nom. in-vers. propos.

Oromediteranske borove šume

Relict oromediterranean and submediterranean orotemperate dry pine forests, juniper woods and related scrub of the Mediterranean

SAB-03 *Berberido creticae-Juniperetalia excelsae* Mucina in Mucina et al. 2016

Oromediteranske borove šume

Relict submediterranean supramediterranean dry pine forests and juniper woods of the Central and Eastern Mediterranean

SAB-03D *Berberido creticae-Juniperion foetidissimae* S. Brullo et al. 2001 – EUNIS G3.5

Oromediteranske borove šume

Silicicolous montane pine and juniper woods and related scrub of continental Hellas, Cyprus, Anatolia and Lebanon

Comment: According to Brullo et al. (2001) these communities are spread not only on silicicolous but various substrata. Furthermore, Sedlar et al. (2011) suggest the Dalmatian pine forests to be included within *Berberido creticae-Juniperion foetidissimae*.

ERI *Erico-Pinetea* Horvat 1959

Bazofilne šume običnog i crnog bora

Relict pine forests and related scrub on calcareous and ultramafic substrates of the Balkans, the Alps, the Carpathians and Crimea

ERI-01 *Erico-Pinetalia* Horvat 1959 nom. conserv. propos.

Bazofilne šume običnog i crnog bora

Relict *Pinus nigra* forests on dolomite and ultramafic substrates of the Dinarides

ERI-01F *Erico-Fraxinion orni* Horvat 1959 nom. in-vers. propos. (syn. *Fraxino orni-Ericion* Horvat 1959) – EUNIS G3.5

Bazofilne šume običnog i crnog bora

Relict *Pinus nigra* forests on dolomite and ultramafic substrates of the Dinarides

MUG *Roso pendulinae-Pinetea mugo* Theurillat in Theurillat et al. 1995

Klekovina krivulja

Pine krummholz in the subalpine belts of the nemoral mountain ranges of Europe

MUG-01 *Junipero-Pinetalia mugo* Boşcaiu 1971

Klekovina krivulja

Pine krummholz in the subalpine belts of the nemoral mountain ranges of Europe

MUG-01D *Lonicero borbasianae-Pinion mugo* Čarni et Mucina 2015 – EUNIS F2.4

Klekovina krivulja

Subalpine calcicolous pine krummholz of the Balkan Peninsula

RHO Rhododendro hirsuti-Ericetea carnea Schubert et al. 2001

Pretplaninske sastojine niskog grmlja

Supramontane to subalpine low heath on calcareous skeletal soils, rocky outcrops, lapies (karren) and boulders of the Alps, Apennines and Dinarides

RHO-01 Rhododendro hirsuti-Ericetalia carnea Grabherr et al. 1993

Pretplaninske sastojine niskog grmlja

Supramontane to subalpine low heath on calcareous skeletal soils, rocky outcrops, lapies and boulders of the Alps, the Apennines and the Dinarides

RHO-01B Aquilegio nigricantis-Rhododendron hirsuti Čarni et Mucina 2015 – EUNIS F2.2

Pretplaninske sastojine niskog grmlja u središnjim Dinaridima

Subalpine heath on rocky calcareous soils of the Central Dinarides

Comment: The name *Ericion carnea* Rübél ex Grabherr et al. 1993 has been used for this communities (e.g. Surina 2013). However, *Ericion carnea* Rübél ex Grabherr et al. 1993 is vicariant alliance of the Alps, the Apennines and the Northern Dinarides (Mucina et al. 2016).

***RHO-01C Daphno oleoidis-Geniston radiatae N. Randelović et Rexhepi 1980 – EUNIS F2.2**

Pretplaninske sastojine niskog grmlja u južnim Dinaridima

Relic supramontane to subalpine low heath on ultramafic and calcareous substrates of the Southern Dinarides

VIR Betulo carpaticae-Alnetea viridis Rejmánek ex Boeuf, Theurillat, Willner, Mucina et Simler in Boeuf et al. 2014

Gorska i pretplaninska vegetacija listopadnog grmlja

Subalpine and subarctic herb-rich alder and willow scrub and krummholz of the Alps, the Carpathians, the Hercynicum, the Balkans, the Caucasus, Northern Europe and Greenland

VIR-01 Alnetalia viridis Rübél ex Karner et Willner in Willner et Grabherr 2007

Pretplaninske zajednice listopadnog grmlja

Subalpine herb-rich alder and willow scrub and krummholz of the Alps, the Balkans and the Caucasus

VIR-01A Alnion viridis Schnyder 1930 – EUNIS F2.3

Pretplaninske zajednice listopadnog grmlja

Subalpine green alder scrub on fertile soils of the Alps and the Balkans

VIR-02 Rhamnetalia fallacis P. Fukarek 1969

Dinarske gorske i pretplaninske zajednice listopadnog grmlja

Relict deciduous scrub in the montane and subalpine belts of the Southern Alps, Dinarides and Apennines

VIR-02B Lonicero-Rhamnion fallacis P. Fukarek 1969 – EUNIS F2.3

Dinarske gorske i pretplaninske zajednice listopadnog grmlja

Relict deciduous scrub in the supramontane and subalpine belts of the Dinarides and Apennines

MUL Mulgedio-Aconitetea Hadač et Klika in Klika et Hadač 1944

Brdska do pretplaninska vegetacija visokih zeleni

Tall-herb vegetation in nutrient-rich habitats moistened and fertilized by percolating water at high altitudes of Europe, Siberia and Greenland

MUL-01 Adenostyletalia alliariae Br.-Bl. 1930

Gorske i pretplaninske zajednice visokih zeleni

Tall-herb vegetation on fertile soils at high altitudes of temperate and mediterranean Europe

MUL-01A Adenostylin alliariae Br.-Bl. 1926 nom. conserv. propos. – EUNIS E5.5

Pretplaninske zajednice visokih zeleni na dubokim dekalcificiranim tlima

Tall-herb vegetation on siliceous substrates at high altitudes in the nemoral zone of Europe

MUL-01C Delphinion elati Hadač in Hadač et al. 1969 – EUNIS E5.5

Gorske i pretplaninske zajednice visokih zeleni na vapnenačkim tlima

Submontane to subalpine calcicolous tall-herb vegetation of the Carpathians

MUL-03 Petasito-Chaerophylletalia Morariu 1967

Brdske i gorske zajednice visokih zeleni

Tall-herb vegetation on nutrient-rich soils along mountain streams of Central Europe, the Balkans and the Apennines

MUL-03A Petasition officinalis Sillinger 1933 – EUNIS E5.4

Brdske i gorske zajednice visokih zeleni na aluvijalnim nanosima

Tall-herb vegetation on raw alluvia of streams in the upper colline to supramontane belts of the Carpathians and the Hercynicum

MUL-03B Arunco-Petasition albi Br.-Bl. et Sutter 1977 – EUNIS E5.4

Gorske zajednice visokih zeleni strmih padina na skeltnim tlima

Tall-herb vegetation on skeletal nutrient-rich soils on steep slopes in the montane and supramontane belts of the Alps

MUL-04 Senecioni rupestris-Rumicetalia alpini Mucina et Karner in Mucina et al. 2016

Gorske i pretplaninske antropogene zajednice visokih zeleni

Tall-herb anthropogenic vegetation on nutrient-rich soils in the upper montane to alpine belts of the nemoral mountain ranges of Europe

***MUL-04A Rumicion alpini Scharfetter 1938 – EUNIS E5.5**

Gorske i pretplaninske antropogene zajednice visokih zeleni

Tall-herb anthropogenic vegetation on nutrient-rich soils in the upper montane to alpine belts of the nemoral mountain ranges of Europe

SES Elyno-Seslerietea Br.-Bl. 1948

Pretplaninske i planinske rudine na vapnenačkoj podlozi

Alpine and subalpine calcicolous swards of the nemoral mountain ranges of Europe

SES-01 Seslerietalia caeruleae Br.-Bl. in Br.-Bl. et Jenny 1926

Srednjoeuropske pretplaninske i planinske rudine na vapnenačkoj podlozi

Alpine and subalpine calcicolous grasslands of the nemoral mountain ranges of Central Europe

SES-01C Caricion ferrugineae G. Br.-Bl. et Br.-Bl. in G. Br.-Bl. 1931 – EUNIS E4.4

Srednjoeuropske pretplaninske i planinske rudine na vapnenačkoj podlozi

Supramontane to alpine calcicolous meso-hygrophilous sedge swards of the Alps and the Carpathians

SES-02 *Seslerietalia tenuifoliae* Horvat 1930

Dinarske gorske do planinske rudine na vapnenačkoj podlozi

Montane to alpine calcicolous tussock grasslands of the Northern Balkans and the Apennines

SES-02A *Seslerion tenuifoliae* Horvat 1930 – EUNIS E4.4

Dinarske gorske i pretplaninske rudine izložene vjetru
Montane and subalpine calcicolous blue-grass tussock grasslands of the Illyrian region and the Northern Dinarides

SES-02B *Seslerio juncifoliae-Caricion firmae* Trinajstić 2005 – EUNIS E4.4

Dinarske planinske rudine izložene vjetru

Alpine calcicolous sedge swards in wind-exposed habitats in the alpine belt of the Illyrian region and the Northern Dinarides

SES-02 *Festucion pungentis* Horvat 1930 (syn. *Festucion bosniacae* Horvat 1930) – EUNIS E4.4

Dinarske pretplaninske rudine zaštićene od vjetra

Subalpine calcicolous tussock grasslands on steep terraced slopes of the Northern Dinarides

1.3. VEGETATION OF THE STEPPE ZONE

Vegetacija stepske zone

1.3.1. ZONAL STEPPE GRASSLANDS

Zonalni stepski travnjaci

FES *Festuco-Brometea* Br.-Bl. et Tx. ex Soó 1947

Suhi bazofilni travnjaci

Dry grassland and steppe vegetation of mostly base- and colloid-rich soils in the submediterranean, nemoral and hemiboreal zones of Europe

FES-01 *Brachypodietalia pinnati* Korneck 1974 nom. conserv. propos. (syn. *Brometalia erecti* Koch 1926 nom. ambig. rejic. propos., *Brometalia erecti* Br.-Bl. 1936 nom. ambig. rejic. propos.)

Umjereno suhi brdski travnjaci na vapnenačkoj podlozi

Meso-xerophytic grasslands on deep calcareous soils of Western and Central Europe

FES-01A *Bromion erecti* Koch 1926 – EUNIS E1.2

Umjereno suhi brdski travnjaci na vapnenačkoj podlozi pod utjecajem atlantske klime

Meso-xerophytic basiphilous grasslands of Western Europe and subatlantic Central Europe

FES-01B *Cirsio-Brachypodium pinnati* Hadač et Klika in Klika et Hadač ex Klika 1951 – EUNIS E1.2

Umjereno suhi brdski travnjaci na vapnenačkoj podlozi pod utjecajem kontinentalne klime

Meso-xerophytic basiphilous grasslands of the subcontinental regions of Central and southeastern Europe

FES-02 *Festucetalia valesiacae* Soó 1947

Stepski travnjaci na dubokim vapnenačkim tlima

Steppes and rocky steppic grasslands on deep soils in the steppe and forest-steppe zones of Europe and northwestern Central Asia

FES-02A *Festucion valesiacae* Klika 1931 nom. conserv. propos. – EUNIS E1.2

Stepski travnjaci na dubokim vapnenačkim tlima

Steppe fescue grasslands on deep calcareous soils of subcontinental Central Europe, Romania, Bulgaria and northwestern Ukraine

FES-05 *Stipo pulcherrimae-Festucetalia pallentis* Pop 1968 nom. conserv. propos.

Kamenjarski stepski travnjaci na vapnenačkoj podlozi

Xerophilous open steppic grasslands on shallow calcareous and siliceous substrates of Central and southeastern Europe

***FES-05D *Chrysopogono-Festucion dalmaticae* Borhidi 1996 – EUNIS E1.1.**

Peripanonski kamenjarski stepski travnjaci na vapnenačkoj podlozi

Xerophilous rocky steppic grasslands on calcareous substrates of the southern fringes of the Pannonian Basin

FES-05I *Diantho lumnitzeri-Seslerion* (Soó 1971) Chytrý et Mucina in Mucina et Kolbek 1993 – EUNIS E1.1, E1.2

Dealpinski reliktni kamenjarski stepski travnjaci na vapnenačkoj podlozi

Dealpine relict xerophilous steppic grasslands on calcareous substrates of southeastern Central Europe

FES-09 *Scorzoneretalia villosae* Kovačević 1959 (syn. *Scorzonero villosae-Chrysopogonetalia grylli* Horvatić et Horvat in Horvatić 1957)

Submediteranski suhi travnjaci na vapnenačkoj podlozi

Amphiadriatic dry steppic submediterranean pastures of the Prealpine, Illyrian and Dinaric regions

FES-09A *Chrysopogono grylli-Koelerion splendidis* Horvatić 1973 (syn. *Chrysopogono-Saturejion subspicatae* Horvat et Horvatić 1934, *Festucion illyricae* / Horvat 1962/ Trinajstić 2000) – EUNIS E1.2

Submediteranski suhi travnjaci na plitkim tlima

Illyrian submediterranean rocky grasslands on shallow calcareous soils

FES-09B *Saturejion subspicatae* Tomić-Stanković 1970 – EUNIS E1.2

Submediteransko-montani suhi kamenjarski travnjaci

Dinaric submediterranean montane calcareous rocky grasslands on shallow soils

FES-09D *Scorzonerion villosae* Horvatić ex Kovačević 1959 – EUNIS E1.2

Submediteranski suhi travnjaci na dubokim tlima

Prealpic and Illyrian meso-xerophytic submediterranean grasslands on deep and partly decalcified soils

1.3.2. INTRAZONAL SALINE VEGETATION OF THE STEPPE ZONE

Intrazonalna halofitska vegetacija stepske zone

FEP *Festuco-Puccinellietea* Soó ex Vicherek 1973

Stepski travnjaci na zaslanjenim tlima

Saline steppes and secondary saline steppic grasslands of the continental regions of Europe

FEP-01 *Puccinellietalia* Soó 1947

Stepski travnjaci na zaslanjenim tlima

Meso-xerophytic saline pastures in the subcontinental and submediterranean zones of the southern regions of Central and Southern Europe

FEP-01C *Puccinellion limosae* Soó 1933 – EUNIS E6.2

Stepski travnjaci na zaslanjenim tlima

Pannonian hypersaline open grasslands on solonetz soils

CRY *Crypsietea aculeatae* Vicherek 1973*Pionirska vegetacija povremenih slanah močvara*

Pioneer ephemeral dwarf-grass vegetation in periodically flooded saline habitats of submediterranean and (sub)continental Eurasia

CRY-01 *Crypsietalia aculeatae* Vicherek 1973*Pionirske zajednice povremenih slanah močvara*

Pioneer ephemeral dwarf-grass vegetation in periodically flooded saline habitats of submediterranean and (sub)continental Eurasia

CRY-01B *Heleochoion schoenioidis* Br.-Bl. ex Rivas Goday 1956 – EUNIS E6.1, C3.5*Pionirska zajednice povremenih slanah močvara*

Pioneer ephemeral dwarf-grass vegetation in periodically flooded saline habitats in the (sub)mediterranean regions of Southern Europe and North Africa

1.4. VEGETATION OF THE MEDITERRANEAN ZONE

Vegetacija primorske zone

1.4.1. ZONAL MEDITERRANEAN FORESTS AND SCRUB

Zonalne primorske šume i šikare

QUI *Quercetea ilicis* Br.-Bl. ex A. Bolós et O. de Bolós in A. Bolós y Vayreda 1950*Primorske vazdazelene šume i makije*

Thermo-mesomediterranean pine and oak forests and associated macchia of the Mediterranean

QUI-01 *Quercetalia ilicis* Br.-Bl. ex Molinier 1934*Primorske vazdazelene šume i makije crnike*

Evergreen and semi-deciduous thermo- to supramediterranean oak and relict laurel forests of the Central and Western Mediterranean

QUI-01D *Fraxino orni-Quercion ilicis* Biondi, Casavecchia et Gigante in Biondi et al. 2013 – EUNIS F5.2, G2.1*Primorske vazdazelene šume i makije crnike*

Evergreen and semideciduous calciphilous holm oak forests of the Central Mediterranean

QUI-03 *Pinetalia halepensis* Biondi, Blasi, Galdenzi, Pesaresi et Vagge in Biondi et al. 2014*Šume alepskog bora*

Thermo-mesomediterranean pine forests of the Central and Eastern Mediterranean

QUI-03A *Pistacio lentisci-Pinion halepensis* Biondi, Blasi, Galdenzi, Pesaresi et Vagge in Biondi et al. 2014 – EUNIS G3.7*Šume alepskog bora*

Thermo-mesomediterranean Aleppo pine forests on calcareous substrates of the Central Mediterranean

QUI-04 *Pistacio lentisci-Rhamnetalia alaterni* Rivas-Mart. 1975*Kserotermne makije*

Thermo-mesomediterranean low-grown matorral, macchia and garrigue of the Mediterranean Basin

QUI-04H *Oleo-Ceratonion siliquae* Br.-Bl. ex Guinochet et Drouineau 1944 – EUNIS B1.6, F5.2, F5.4, F5.5, G2.4*Kserotermne makije*

Thermomediterranean calcicolous macchia of the Liguro-Tyrrhenian seaboard

ROS *Ononido-Rosmarinetea* Br.-Bl. in A. Bolós y Vayreda 1950 (syn. *Cisto-Micromerietea julianae* Oberd. 1954, *Erico-**Cistetea* Trinajstić 1985)*Primorski bušići*

Mediterranean scrub (tomillar, espleguer, romeral, garrigue, phrygana, batha) on base-rich substrates

ROS-06 *Cisto-Micromerietalia julianae* Oberd. 1954 (syn. *Cisto-Ericetalia* Horvatić 1958)*Primorski bušići*

Thermo-mesomediterranean phrygana of the continental Hellas and the Adriatic and Ionian seaboard

ROS-06A *Cisto cretici-Ericion manipuliflorae* Horvatić 1958 – EUNIS B1.6, F6.3*Primorski bušići*

Thermomediterranean calcicolous garrigue of the Dalmatian and Istrian Adriatic seaboard

1.4.2. INTRAZONAL MEDITERRANEAN SCRUB

Intrazonalne primorske šikare

NER *Nerio-Tamaricetea* Br.-Bl. et O. de Bolós 1958*Primorske šikare uz trajne i povremene vodotoke*

Circummediterranean and Macaronesian riparian scrub

NER-01 *Tamaricetalia africanae* Br.-Bl. et O. de Bolós 1958*Primorske šikare uz trajne i povremene vodotoke*

Circummediterranean and Macaronesian riparian scrub

NER-01E *Tamaricion dalmaticae* Jasprica in Jasprica et al. 2016 – EUNIS F9.3*Primorske šikare uz trajne i povremene vodotoke*

Thermo-mesomediterranean tamarisk scrub of the Balkan Adriatic seaboard

CYT *Cytisetea scopario-striati* Rivas-Mart. 1974*Šikare zečjaka*

Mediterranean and (sub)atlantic temperate broomy scrub (retamal, piornal, escobonal) seral to forests on acidic substrates

CYT-03 *Spartio juncei-Cytisetalia scoparii* Mucina in Mucina et al. 2016*Šikare zečjaka*

Temperate (sub)atlantic broom heath of Western Europe and the Southern European peninsulas

CYT-03A *Sarothamnion scoparii* Oberd. 1957 – EUNIS F3.1Šikare zečjaka*

Acidophilous broom and gorse mantle on forest edges and in forest clearings of the (sub)atlantic regions of Western Europe

Comment: This type of vegetation is of anthropogenic origin and is spreading spontaneously.

1.4.3. INTRAZONAL MEDITERRANEAN GRASSLANDS AND HERBLANDS

Intrazonalni primorski travnjaci

LYG *Lygeo sparti-Stipetea tenacissimae* Rivas-Mart. 1978 nom. conserv. propos. (*Thero-Brachypodietea* Br.-Bl. in Br.-Bl. et al. 1947)*Primorski travnjaci s prevlašću trajnica na vapnenačkoj podlozi*

Circummediterranean pseudosteppes on calcareous rocky substrates and relict edaphic steppes on deep clayey soils

LYG-01 *Cymbopogono-Brachypodietalia ramosi* Horvatić 1963*Primorski travnjaci s prevlašću trajnica na vapnenačkoj podlozi*

Circum-mediterranean thermo- to supramediterranean pseudosteppes on sandy-loamy soils over calcareous bedrocks

LYG-01G *Cymbopogono-Brachypodium ramosi* Horvatić 1963 – EUNIS E1.3

Primorski travnjaci s prevlašću trajnica na vapnenačkoj podlozi

Thermo-mesomediterranean pseudosteppes on calcareous sandy soils of the Eastern Mediterranean

BUL *Poetea bulbosae* Rivas Goday et Rivas-Mart. in Rivas-Mart. 1978

Primorski pašnjaci na dekalificiranim tlima

Mediterranean and Magrebinian seasonal perennial and ephemeroidean pastures in the thermo- to oromediterranean belts

BUL-01 *Poetalia bulbosae* Rivas Goday et Rivas-Mart. in Rivas Goday et Ladero 1970

Primorski pašnjaci na dekalificiranim tlima

Mediterranean and Maghrebinian seasonal perennial and ephemeroidean pastures in the thermo- to oromediterranean belts

BUL-01F *Romulion* Oberd. 1954 – EUNIS E1.3

Primorski pašnjaci na dekalificiranim tlima

Macedonian seasonal perennial pastures on acidic substrates

TUB *Helianthemetea guttati* Rivas Goday et Rivas-Mart. 1963

Primorski travnjaci s prevlašću jednogodišnjih biljaka na dekalificiranim tlima

Mediterranean and submediterranean-atlantic annual low-grown ephemeral herb- and grass-rich vegetation on acidic substrates

TUB-02 *Vulpietalia Pignatti* 1953

Primorski travnjaci s prevlašću jednogodišnjih biljaka na dekalificiranim tlima

Mediterranean and Ibero-Atlantic ephemeral therophytic vegetation on coastal sand dunes under influence of salt spray

TUB-02D *Vulpio-Lotion* Horvatić 1963 (syn. *Loto angustifoliae-Vulpion ciliatae* Horvatić 1960 nom. invers. propos.) – EUNIS E1.A, B1.4

Primorski travnjaci s prevlašću jednogodišnjih biljaka na dekalificiranim tlima

Ephemeral therophytic vegetation on the terra rossa and decalcified soils of the Illyrian-Dinaric coastal regions

TRA *Stipo-Trachynietea distachyae* S. Brullo in S. Brullo et al. 2001

Primorski travnjaci s prevlašću jednogodišnjih biljaka na vapnenačkoj podlozi

Mediterranean calciphilous annual and ephemeroidean swards and grasslands

TRA-02 *Ptilostemonea stellati-Vulpietalia ciliatae* Mucina ined.

Primorski travnjaci s prevlašću jednogodišnjih biljaka na vapnenačkoj podlozi

Central and Eastern Mediterranean therophytic swards on shallow sandy and loamy soils over limestone and gypsum substrates

TRA-02A *Vulpio ciliatae-Crepidion neglectae* Poldini 1989 – EUNIS E1.3

Primorski travnjaci s prevlašću jednogodišnjih biljaka na vapnenačkoj podlozi

Therophytic swards on disturbed calcareous rubble-rich shallow soils of the Adriatic and Ionian seaboard

2. AZONAL VEGETATION

Azonalna vegetacija

2.1. ALLUVIAL FORESTS AND SCRUB

Aluvijalne šume i šikare

POP *Alno glutinosae-Populetea albae* P. Fukarek et Fabijanić 1968

Galerijske i plavljene šume uz vodotoke

Riparian gallery forests of the Eurosiberian and Mediterranean regions

POP-01 *Populetea albae* Br.-Bl. ex Tchou 1949 nom. conserv. propos.

Sredozemne galerijske šume uz vodotoke

Mediterranean and submediterranean riparian gallery forests

***POP-01F** *Lauro nobilis-Fraxinon angustifoliae* I. Kárpáti et V. Kárpáti 1961 – EUNIS G1.3

Sredozemne galerijske šume uz vodotoke

Riparian gallery forests with relict laurisilva elements of the eastern submediterranean regions of the Apennine and Balkan Peninsulas

Comment: There are only remnants of the white poplar stands in Mediterranean Croatia (Krčić, Župa Dubrovačka, lower Neretva). Some authors do not separate this alliance from the west-mediterranean *Populion albae* Br.-Bl. ex Tchou 1949 (Douda et al. 2015).

POP-02 *Alno-Fraxineta excelsioris* Passarge 1968

Vlažne i periodično plavljene šume na aluvijalnim nanosima

Floodplain riparian forests on nutrient-rich alluvial soils of temperate and boreal Europe

POP-02A *Alnion incanae* Pawłowski et al. 1928 – EUNIS G1.2

Šume crne i bijele johe uz vodotoke

Alder-ash and oak riparian floodplain forests on nutrient-rich alluvial soils in the nemoral zone of Europe

POP-02D *Alno-Quercion roboris* Horvat 1950 – EUNIS G1.2

Šume s prevlašću lužnjaka, poljskog jasena i brijesta u nizinskom pojasu

Alder-oak riparian floodplain forests on nutrient-rich alluvial soils of the temperate regions of the Balkan Peninsula

Comment: There are different approaches to syntaxonomy of lowland forests (Vukelić et al. 2012). Some authors do not separate *Alno-Quercion roboris* Horvat 1950 from *Alnion incanae* Pawłowski et al. 1928 (Douda et al. 2015).

PUR *Salicetea purpureae* Moor 1958

Šume i šikare vrba uz vodotoke

Willow and tamarisk scrub and low open forests of riparian habitats in the temperate to arctic zones of Europe

PUR-01 *Salicetalia purpureae* Moor 1958

Šume i šikare vrba uz vodotoke

Willow scrub and low open forests of riparian habitats in the temperate to arctic zones of Europe

PUR-01A *Salicion elaeagno-daphnoidis* (Moor 1958) Grass 1993 – EUNIS F9.1

Šikare vrba uz vodotoke u brdskom i gorskom pojasu

Willow scrub on the gravelly stream banks in the submontane to subalpine belts of the Alps, the Pyrenees and the Carpathians

PUR-01B *Salicion albae* Soó 1951 – EUNIS G1.1

Šume vrba i topola uz vodotoke od nizinskog do brdskog pojasa, te u submediteranu

Willow and poplar low open forests of lowland to submontane river alluvia in the nemoral zone of Europe and at high altitudes of the Mediterranean

PUR-01C *Salicion triandrae* T. Müller et Görs 1958 – EUNIS F9.1

Šikare vrba uz vodotoke od nizinskog do brdskog pojasa

Willow scrub on loamy-sandy sedimentary river banks in the lowland to submontane belts of the nemoral zone of Europe

2.2. SWAMP FORESTS AND SCRUB

Močvarne šume i šikare

ALN *Alnetea glutinosae* Br.-Bl. et Tx. ex Westhoff et al. 1946

Močvarne i periodično plavljene šume s crnom johom

European mesotrophic regularly flooded alder carr and birch wooded mires

ALN-01 *Alnetalia glutinosae* Tx. 1937

Močvarne i periodično plavljene šume s crnom johom

European mesotrophic regularly flooded alder carrs

ALN-01A *Alnion glutinosae* Malcuit 1929 – EUNIS G1.4

Močvarne šume crne joha

European mesotrophic regularly flooded alder carrs

***ALN-01B *Frangulo alni-Fraxinion oxycarpae* Polidini, Sburlino et Venanzoni in Biondi et al. 2015** – EUNIS G1.4

Sredozemne močvarne šume

Amphiadriatic mesotrophic interdune and karstic ash carrs

FRA *Franguletea Doing* ex Westhoff in Westhoff et Den Held 1969

Močvarne šikare

Willow carrs of Western Europe, Fennoscandia and the subatlantic regions of Central Europe

FRA-01 *Salicetalia auritae* Doing 1962

Močvarne šikare

Willow carrs of Western Europe, Fennoscandia and the subatlantic regions of Central Europe

FRA-01A *Salicion cinereae* T. Müller et Görs ex Passarge 1961 – EUNIS F9.2

Močvarne šikare

Willow carrs of Western Europe and the subatlantic regions of Central Europe

2.3. VEGETATION OF COASTAL CLIFFS AND DUNES

Vegetacija priobalnih stijena i dina

SAG *Saginetea maritimae* Westhoff et al. 1962

Vegetacija sredozemnih slanih utrina

Atlantic-Mediterranean and Macaronesian ephemeral winter-annual vegetation in disturbed saline habitats and inland saline badlands

SAD-01 *Saginetalia maritimae* Westhoff et al. 1962

Zajednice sredozemnih slanih utrina

Atlantic-Mediterranean ephemeral vegetation on aerohaline sandy soils of disturbed salt-marsh fringes

SAG-01C *Junco ranarii-Plantaginion commutatae* Horvatić 1934 – EUNIS A2.5, B1.8

Zajednice sredozemnih slanih utrina

Adriatic short-lived aerohaline vegetation of sandy flats of disturbed salt-marshes

CRI *Crithmo-Staticetea* Br.-Bl. in Br.-Bl. et al. 1952

Vegetacija na stijenama u zoni prskanja mora

Rupicolous vegetation of salt-sprayed coastal cliffs of the Atlantic and Mediterranean seaboard of Europe, North Africa and Middle East

CRI-01 *Crithmo-Staticetalia* Molinier 1934

Halofitske zajednice grebenjača

Rupicolous vegetation of salt-sprayed cliffs of the Atlantic and Mediterranean coasts of Europe, North Africa and Middle East

CRI-01D *Limonion anfracti-cancellati* (Horvatić 1934) *Mucina* in *Mucina* et al. 2016 (*Staticion dal-maticum* Horvatić 1934) – EUNIS B3.3

Halofitske zajednice grebenjača

Rupicolous herb-rich vegetation of salt-sprayed rocky cliffs of the Adriatic coasts

CRI-02 *Helichrysetalia italici* Biondi et Géhu in Géhu et Biondi 1994

Zajednice polugrmova na stijenama u zoni prskanja mora

Sub-aerohaline coastal dwarf scrub on inland edges of salt-sprayed cliffs of the Mediterranean seaboard

CRI-02E *Anthyllidion barbae-jovis* S. Brullo et De Marco 1989 – EUNIS B3.3

Zajednice visokih polugrmova na stijenama u zoni prskanja mora

Subaerohaline coastal dwarf scrub on salt-sprayed cliffs of the eastern Tyrrhenian Sea

***CRI-02F *Crucianellion rupestris* S. Brullo et Furnari 1990** – EUNIS B3.3

Zajednice niskih polugrmova na stijenama u zoni prskanja mora

Subaerohaline dwarf scrub on salt-sprayed cliffs of the European and North African coasts of the Lybian Sea

CAK *Cakiletea maritimae* Tx. et Preising in Tx. ex Oberd. 1952

Pionirska halonitrofilna vegetacija na pješčanim i šljunčanim obalama

Pioneer halo-nitrophilous short-lived vegetation in strandlines of sandy and shingle beaches of the coasts of the North Atlantic and Arctic Oceans, the Mediterranean and the Black Sea

CAK-03 *Thero-Atriplicetalia* Pignatti 1953 (syn. *Euphorbietalia peplidis* Tx. 1950)

Pionirske halonitrofilne zajednice na pješčanim i šljunčanim obalama

Pioneer halo-nitrophilous strandline vegetation of the Cantabro-Atlantic, the Mediterranean and the Black Sea coasts

CAK-03A *Euphorbion peplidis* Tx. ex Oberd. 1952 – EUNIS B1.1, B1.2, B2.1, B2.2

Pionirske halonitrofilne zajednice na pješčanim i šljunčanim obalama

Pioneer halo-nitrophilous strandline vegetation of the Cantabro-Atlantic and the Mediterranean coasts

AMM *Ammophiletea* Br.-Bl. et Tx. ex Westhoff et al. 1946

Vegetacija trajnica na priobalnim pješčanim dinama

Tall-grass perennial swards on mobile coastal dunes of the seaboard of Europe, North America, Greenland, North Africa, Middle East and the Caspian Sea

AMM-01 *Ammophiletalia* Br.-Bl. et Tx. ex Westhoff et al. 1946

Zajednice trajnica na priobalnim pješčanim dinama

Tall-grass perennial swards on mobile white and embryonic

coastal dunes of the warm-temperate to boreo-atlantic coasts of the Mediterranean and the Black and Caspian Seas

AMM-01A *Ammophilion* Br.-Bl. 1921 – EUNIS B1.3
Zajednice trajnica na priobalnim pješčanim dinama
Tall-grass perennial swards on mobile white and embryonic coastal sand dunes of the Mediterranean

2.4. VEGETATION OF ROCK CREVICES AND SCREES

Vegetacija pukotina stijena i sipara

ADI *Adiantetea* Br.-Bl. et al. 1952

Vegetacija sredozemnih nakapnica i plitkih polušpilja

Relict chomophytic and chasmophytic vegetation in the shaded and water-splashed habitats of the Mediterranean, the Atlantic islands, North Africa and Middle East

ADI-01 *Adiantetalia* Br.-Bl. ex Horvatić 1934

Zajednice sredozemnih nakapnica i plitkih polušpilja

Relict chomophytic and chasmophytic vegetation in shaded and water-splashed habitats of the Mediterranean, the Atlantic islands, North Africa and Middle East

ADI-01A *Adiantion* Br.-Bl. ex Horvatić 1934 – EUNIS C2.1, H3.4

Zajednice sredozemnih nakapnica i plitkih polušpilja

Relict fern-rich chasmophytic communities in shaded and water-splashed habitats of the Mediterranean, the Atlantic islands, North Africa and Middle East

POD *Polypodietea* Jurko et Peciar ex Boşcaiu, Gergely et Codoreanu in Raţiu et al. 1966

Vegetacija s prevlašću mahovina i paprati na sjenovitim stijenama, panjevima i kori stabala

Chomophytic, chasmophytic and epiphytic vegetation of fern- and moss-rich communities in crevices and on the surface of rocky cliffs of temperate and mediterranean Europe

POD-01 *Hypno cupressiformi-Polypodietalia vulgaris* Jurko et Peciar ex Mucina et Theurillat 2015

Zajednice na sjenovitim silikatnim stijenama, panjevima i kori stabala

Fern- and moss-rich chomophytic, chasmophytic and epiphytic vegetation of shaded rock faces and bark of old trees of cool-temperate Europe

POD-01A *Hypno-Polypodion vulgaris* Mucina 1993 – EUNIS H3.1

Zajednice na sjenovitim silikatnim stijenama, panjevima i kori stabala

Fern-rich vegetation of siliceous shaded rock crevices in the colline and submontane belts of Central and Eastern Europe

POD-03 *Ctenidio-Polypodietalia vulgaris* Jurko et Peciar ex Boşcaiu, Gergely et Codoreanu in Raţiu et al. 1966

Zajednice na sjenovitim vapnenačkim stijenama

Vegetation of shady calcareous rock faces and crevices at low altitudes of cool-temperate and submediterranean Europe

POD-03A *Ctenidio-Polypodion vulgaris* S. Brullo et al. 2001 – EUNIS H3.2

Zajednice s češljastom mahovinom na sjenovitim vapnenačkim stijenama

Vegetation of shady calcareous rock faces and crevices of the Alps and the Carpathians

POD-03B *Moehringion muscosae* Horvat et Horvatić ex Boşcaiu, Gergely et Codoreanu in Raţiu et al. 1966 – EUNIS H3.2

Zajednice s mahovinastom merinkom na sjenovitim vlažnim vapnenačkim stijenama

Vegetation of shady calcareous rock faces and crevices of southeastern Europe

ASP *Asplenietea trichomanis* (Br.-Bl. in Meier et Br.-Bl. 1934) Oberd. 1977

Vegetacija polusjenovitih i otvorenih stijena

Chasmophytic vegetation of crevices, rocky ledges and faces of rocky cliffs and walls of Europe, North Africa, Middle East, the Arctic archipelagos and Greenland

ASP-01 *Geranio robertiani-Asplenietalia trichomanis* Ferrez ex Mucina ined.

Zajednice polusjenovitih i otvorenih stijena od nizinskog do gorskog pojasa

Chasmophytic vegetation of semi-shaded and sunny rock faces and crevices in the lowland to submontane belts of temperate Europe

ASP-01A *Asplenio scolopendrii-Geranium robertiani* Ferrez 2010 – EUNIS H3.1, H3.2

Zajednice polusjenovitih i otvorenih stijena od nizinskog do gorskog pojasa

Chasmophytic vegetation of semi-shaded and sunny rock faces and crevices in the lowland to submontane belts of temperate Europe

ASP-02 *Potentilletalia caulescentis* Br.-Bl. in Br.-Bl. et Jenny 1926

Zajednice otvorenih vapnenačkih stijena u gorskom i pretplaninskom pojasu

Chasmophytic vegetation of sunny calcareous rock faces and crevices at high altitudes of the nemoral and boreal mountain ranges of Europe

ASP-2A *Potentillion caulescentis* Br.-Bl. in Br.-Bl. et Jenny 1926 – EUNIS H3.2

Zajednice otvorenih vapnenačkih stijena u gorskom i pretplaninskom pojasu Gorskog kotara

Chasmophytic vegetation of calcareous rock faces and crevices in the subalpine and alpine belts of the Central and Eastern Alps and the Western Carpathians

ASP-2L *Micromerion croaticae* Horvat in Blečić 1959 – EUNIS H3.2

Zajednica otvorenih vapnenačkih stijena u gorskom i pretplaninskom pojasu Like i Velebita

Chasmophytic vegetation of calcareous rock faces and crevices in the subalpine belt of the northwestern Dinarides

ASP-03 *Moltkeetalia petraeae* Lakušić 1968

Zajednice vapnenačkih stijena od brdskog do pretplaninskog pojasa središnjih i južnih Dinarida

Chasmophytic vegetation of limestone crevices in the montane to alpine belts of the Central and Southern Dinarides

ASP-03A *Edraianthion* Lakušić 1968 – EUNIS H3.2

Zajednice vapnenačkih stijena od brdskog do pretplaninskog pojasa središnjih i južnih Dinarida

Chasmophytic vegetation of limestone crevices in the montane and supramontane belts of the Central and Southern Dinarides

ASP-05 *Centaureo dalmaticae-Campanuletalia pyramidalis* Trinajstić ex Terzi et Di Pietro 2016

Zajednice priobalnih vapnenačkih stijena

Thermo-mesomediterranean chasmophytic vegetation of limestone cliffs of the Northern and Central Adriatic coastal regions

ASP-05A *Centaureo dalmaticae-Campanulion* Horvatić 1934 – EUNIS H3.2*Zajednice priobalnih vapnenačkih stijena kvarnersko-liburnijskog područja*

Thermo-mesomediterranean chasmophytic vegetation of limestone crevices of the Northern Adriatic seaboard

ASP-05B *Centaureo cuspidatae-Portenschlagiellion ramosissimae* Trinajstić ex Terzi et Di Pietro 2016 – EUNIS H3.2*Zajednice priobalnih vapnenačkih stijena Dalmacije*

Thermo-mesomediterranean chasmophytic vegetation of limestone crevices of the Central and Southern Adriatic seaboard

ASP-10 *Asplenietalia septentrionalo-cuneifolii* Mucina et Theurillat 2015*Zajednice polusjenovitih i otvorenih silikatnih i serpentinskih stijena*

Chasmophytic vegetation of siliceous and ultramafic rock crevices at low altitudes of temperate and boreal Europe

ASP-10B *Asplenion septentrionalis* Gams ex Oberd. 1938 – EUNIS H3.1*Zajednice polusjenovitih i otvorenih silikatnih stijena*

Fern-rich chasmophytic vegetation of siliceous sunny rock crevices and boulder fields of temperate and boreal Europe

ASP-10C *Asplenion serpentini* Br.-Bl. et Tx. ex Egger 1955 – EUNIS H3.2*Zajednice polusjenovitih i otvorenih serpentinskih stijena*

Fern-rich chasmophytic vegetation of ultramafic rock crevices of Central Europe

CYM *Cymbalario-Parietarietea diffusae* Oberd. 1969 (syn. *Parietarietea judaicae* Oberd. 1977)*Termofilna vegetacija u pukotinama zidova*

Thermophilous chasmophytic vegetation of walls of the Mediterranean and the winter-mild atlantic to subcontinental regions of temperate Europe, Middle East and North Africa

CYM-01 *Tortulo-Cymbalarietalia* Segal 1969 (syn. *Parietarietalia judaicae* /Rivas-Mart. ex Rivas Goday 1964/ Oberd. 1977)*Termofilna vegetacija u pukotinama zidova*

Thermophilous chasmophytic vegetation of walls of the Mediterranean and the winter-mild atlantic to subcontinental regions of temperate Europe, Middle East and North Africa

CYM-01A *Cymbalario-Asplenion* Segal 1969 – EUNIS E5.1*Kontinentalna termofilna vegetacija u pukotinama zidova*

Fern-rich chasmophytic vegetation of sunny walls of the atlantic to subcontinental regions of cool-temperate Europe

CYM-01B *Galio valantiae-Parietarion judaicae* Rivas-Mart. ex O. de Bolòs 1967 (syn. *Parietarion judaicae* Segal 1969, *Parietario-Centranthion rubri* Rivas-Mart. 1960) – EUNIS E5.1*Primorska termofilna vegetacija u pukotinama zidova*

Thermomediterranean chasmophytic vegetation of limestone walls of the Iberian Peninsula and the Western Tyrrhenian archipelago

CYM-01C *Artemisio arborescentis-Capparidion spinosae* Biondi, Blasi et Galdenzi in Biondi et al. 2014 – EUNIS E5.1*Termofilna vegetacija u pukotinama zidova vanjskih dalmatinskih otoka i hridi*

Thermomediterranean chasmophytic vegetation of limestone walls of the Apennine Peninsula, Corsica, Sardinia, Sicily and Malta

THL *Thlaspietea rotundifolii* Br.-Bl. 1948*Vegetacija na siparima i šljunčanim obalama vodotoka*

Vegetation of scree habitats and pebble alluvia of the temperate, boreal and oromediterranean Europe and the Arctic archipelagos

THL-01 *Thlaspietalia rotundifolii* Br.-Bl. in Br.-Bl. et Jenny 1926*Zajednice na vapnenačkim siparima vršnih dijelova Dinarida*

Alpine and subalpine calcareous scree vegetation of Europe and Greenland

THL-01J *Saxifragion prenjae* Lakušić 1968 – EUNIS H2.4*Reliktne zajednice na vapnenačkim siparima dâna dubokih ponikvi Velebita i Dinare*

Subalpine chionophilous calcareous scree communities of the Southern and Central Dinarides

THL-01K *Bunion alpini* Lakušić 1968 – EUNIS H2.4*Zajednice na vapnenačkim siparima vršnih dijelova Dinarida*

Subalpine chionophilous calcareous scree communities of the Northern Dinarides

THL-02 *Arabidetalia caeruleae* Rübél ex Nordhagen 1937*Zajednice na snježištima i umirenim vapnenačkim siparima u pretplaninskom pojasu*

Vegetation of snow-beds on stabilized calcareous screes of the arctic zone and the alpine and subnival belts of European mountains

THL-02C *Arabidion caeruleae* Br.-Bl. in Br.-Bl. et Jenny 1926 (syn. *Salicion retusae* Horvat 1949) – EUNIS E4.1*Zajednice na snježištima i umirenim vapnenačkim siparima u pretplaninskom pojasu*

Vegetation of snow-beds on stabilized calcareous screes in the alpine and subnival belts of European mountains

THL-04 *Arabido alpinae-Petasitetalia paradoxi* Mucina et Valachovič ined.*Zajednice na vlažnim vapnenačkim točilima i siparima u gorskom i pretplaninskom pojasu*

Vegetation of humid calcareous screes and boulder fields in the montane to subalpine belts of the nemoral mountain ranges of Europe

THL-04A *Petasition paradoxi* Zollitsch ex Lippert 1966 – EUNIS H2.4*Zajednice na vlažnim vapnenačkim točilima i siparima u gorskom i pretplaninskom pojasu*

Vegetation of humid calcareous fine-grained screes in the montane and subalpine belts of the Alps

THL-05 *Stipetalia calamagrostis* Oberd. et Seibert in Oberd. 1977*Zajednice na termofilnim vapnenačkim i dolomitnim siparima u brežuljkastom do gorskom pojasu*

Thermophilous calcareous scree vegetation in the colline to montane belts of Central and Western Europe

THL-05C *Stipion calamagrostis* Jenny-Lips ex Br.-Bl. 1950 – EUNIS H2.6

Zajednice na termofilnim vapnenačkim i dolomitnim siparima u brežuljkastom do gorskom pojasu

Vegetation of thermophilous low-altitude calcareous scree of Central and Western Europe

THL-08 *Epilobietalia fleischeri* Moor 1958 nom. conserv. propos.

Zajednice na šljunčanim obalama vodotoka

Vegetation of montane to subalpine riverine gravel terraces of the nemoral and boreal European mountain ranges and the Caucasus

THL-08C *Epilobion fleischeri* G. Br.-Bl. ex Br.-Bl. 1950 – EUNIS C3.5

Zajednice na šljunčanim obalama vodotoka

Vegetation of the montane-subalpine riverine gravel terraces of the Alps and the Carpathians

DRY *Drypidetea spinosae* Quézel 1964

Vegetacija na siparima primorskih padina Dinarida

Vegetation of scree habitats and pebble alluvia in the submediterranean montane and supra-oromediterranean belts of the Central and Eastern Mediterranean and the Black Sea seaboards

DRY-01 *Drypidetalia spinosae* Quézel 1964

Zajednice na siparima primorskih padina Dinarida

Montane submediterranean and oromediterranean scree vegetation of the Balkans, Crete and Crimea

DRY-01A *Peltarion alliaceae* Horvatić in Domac 1957 – EUNIS H2.6

Zajednice na siparima primorskih padina Dinarida u brdskom i gorskom pojasu

Limestone scree vegetation in the submontane and montane belts of the Central Balkans

DRY-01B *Silenion marginatae* Lakušić 1968 (syn. *Silenion prostratae* Trinajstić 2008) – EUNIS H2.6

Zajednice na siparima primorskih padina Dinarida u pretplaninskom pojasu

Limestone scree vegetation in the montane to subalpine belts of the Southern Dinarides

2.5. VEGETATION OF SALINE AND BRACKISH WATERS AND SWAMPS

Vegetacija slanih i bočatih voda i močvara

ZOS *Zosteretea Pignatti* 1953

Morske livade svilinā i posidonije

Vegetation of sea-grass meadows on muddy and sandy submerged substrates of the temperate and subarctic seas surrounding Europe

ZOS-01 *Zosteretalia Béguinot* ex Pignatti 1953

Morske livade svilinā

Vegetation of sea-grass meadows of the sandy-muddy sublittoral of the temperate seas surrounding Europe

ZOS-01A *Zosterion marinae* Br.-Bl. et Tx. ex Pignatti 1953 – EUNIS A2.6

Morske livade morske sviline

Vegetation of perennial sea-grass meadows of the sandy-muddy sea sublittoral of the cold- and cool-temperate seas surrounding Europe

ZOS-01B *Nanozosterion noltii* Den Hartog ex Mucina in Mucina et al. 2016 – EUNIS A2.6

Morske livade patuljaste sviline

Vegetation of short-lived sea grass meadows of the sandy-muddy sea sublittoral of the cold-temperate and cool-temperate seas surrounding Europe

ZOS-02 *Posidonietalia oceanicae* Den Hartog ex Mucina in Mucina et al. 2016

Morske livade posidonije

Vegetation of perennial sea-grass meadows of the sandy-rocky sublittoral of the warm-temperate waters of the Mediterranean Sea

ZOS-02A *Posidonion oceanicae* Br.-Bl. ex Molinier 1960 – EUNIS A2.6

Morske livade posidonije

Vegetation of perennial sea-grass meadows of the sandy-rocky sublittoral of the warm-temperate waters of the Mediterranean Sea

HAL *Halodulo wrightii-Thalassietea testudinum* Rivas-Mart. et al. 1999

Morske livade čvoraste morske rese

Vegetation of eel-grass swards on muddy and sandy substrates of subtropical and tropical seas fringing Atlantic Ocean

HAL-01 *Thalassio-Syringodetalia filiformis* Knapp ex Borhidi et al. 1979

Morske livade čvoraste morske rese

Vegetation of eel-grass swards on muddy and sandy substrates of the sublittoral of subtropical and tropical seas fringing Atlantic Ocean

***Cymodoceion nodosae* Den Hartog ex Mucina in Mucina et al. 2016** – EUNIS A2.6

Morske livade čvoraste morske rese

Vegetation of eel-grass swards on muddy and sandy substrates of the sublittoral of the subtropical Atlantic Ocean and the Mediterranean Sea

RUP *Ruppiaetea maritima* J. Tx. ex Den Hartog et Segal 1964

Vegetacija bočatih voda s rupijom

Submerged rooted herbaceous vegetation of brackish waters of the World

RUP-01 *Ruppiaetea* J. Tx. ex Den Hartog et Segal 1964 nom. conserv. propos.

Zajednice rupije u bočatim vodama

Submerged rooted herbaceous vegetation of temperate brackish waters of Europe

RUP-01A *Ruppion maritima* Br.-Bl. ex Westhoff in Bennema et al. 1943 – EUNIS A2.6

Zajednice rupije u bočatim vodama

Submerged rooted herbaceous vegetation of temperate brackish waters of Europe

SPA *Spartinetea maritima* Beefink 1962

Pionirska vegetacija sa spartinom u zoni plime i oseke

Pioneer vegetation of perennial cord grasses on tidal flats of temperate seas of the World

SPA-01 *Spartinetalia glabrae* Conard 1935

Pionirske zajednice sa spartinom u zoni plime i oseke

Pioneer vegetation of perennial cord grasses on tidal flats of temperate seas of the World

SPA-01A *Spartinion glabrae* Conard 1935 – EUNIS A2.5

Pionirske zajednice sa spartinom u zoni plime i oseke

Pioneer vegetation of perennial cord grasses on tidal flats of temperate seas of Europe and North America

THE *Therosalicornietea* Tx. in Tx. et Oberd. 1958

Pionirska vegetacija slanjača s jednogodišnjim biljkama

Pioneer vegetation of annual succulent halophytes on tidal mud flats and edges of the irregularly flooded saline inland waters of Eurasia

THE-01 *Therosalicornietalia* Pignatti 1952

Pionirske zajednice slanjača s jednogodišnjim biljkama
Pioneer vegetation of annual succulent halophytes of tidal mud flats and edges of the irregularly flooded saline inland waters of the Mediterranean, and temperate, boreal and subarctic Europe

THE-01A *Therosalicornion* Br.-Bl. 1933 – EUNIS A2.5

Pionirske zajednice slanjača s jednogodišnjim biljkama
Mediterranean and thermo-atlantic pioneer vegetation of annual succulent plants of tidal flats and irregularly flooded inland depressions

JUN *Juncetea maritimi* Br.-Bl. in Br.-Bl. et al. 1952

Primorske sitine i halonitrofilni travnjaci

Perennial grasslands and herb-rich vegetation of coastal and inland salt-marshes and sea-cliffs of the Mediterranean Sea and the Atlantic and Arctic Oceans

JUN-01 *Juncetalia maritimi* Br.-Bl. ex Horvatić 1934

Primorske sitine i zaslanjeni travnjaci

Mediterranean and thermo-atlantic tall-rush saline wetland vegetation

JUN-01A *Juncion maritimi* Br.-Bl. ex Horvatić 1934 – EUNIS A2.5

Primorske sitine

Mediterranean and thermo-atlantic coastal saline rush marsh vegetation under a prolonged flooding regime

JUN-01E *Agropyro-Plantaginion maritimi* Horvatić 1934 – EUNIS A2.5

Primorski zaslanjeni travnjaci

Central and Eastern Mediterranean saline swards of margins of lagoons and damp dune-slacks

JUN-02 *Agropyretalia pungentis* Géhu 1968

Primorski halonitrofilni travnjaci

Halo-nitrophilous grasslands of salt-sprayed sandy-loamy shores of the winter-mild atlantic and mediterranean regions of Europe

***JUN-02C *Agropyro-Artemision coerulescentis* Pignatti 1953** – EUNIS A2.5

Primorski halonitrofilni travnjaci

Tyrrhenian-Adriatic (sub)halo-nitrophilous salt-sprayed grassy scrub of the edges of coastal lagoons

SAL *Salicornietea fruticosae* Br.-Bl. et Tx. ex A. Bolòs y Vayreda et O. de Bolòs in A. Bolòs y Vayreda 1950

Vegetacija slanjača s polugrmovima

Mediterranean and thermo-atlantic perennial salt-marsh herblands and scrub

SAL-01 *Salicornietalia fruticosae* Br.-Bl. 1933

Zajednice slanjača s polugrmovima

Mediterranean and thermo-atlantic halophilous coastal tidal and inland temporarily flooded succulent chenopod scrub

SAL-01A *Salicornion fruticosae* Br.-Bl. 1933 – EUNIS A2.5

Zajednice slanjača s polugrmovima

Mediterranean and thermo-atlantic intertidal succulent dwarf chenopod scrub

2.6. FRESHWATER AQUATIC VEGETATION

Slatkovodna vegetacija

LEM *Lemnetea* O. de Bolòs et Masclans 1955

Vegetacija plutajućih makrofita u mirnim vodama

Free-floating duckweed vegetation of still and relatively nutrient-rich freshwater bodies of the Holarctic

LEM-01 *Lemnetalia minoris* O. de Bolòs et Masclans 1955

Zajednice plutajućih makrofita u mirnim vodama

Vegetation of free-floating vegetation of still and relatively nutrient-rich freshwater bodies of temperate Europe

LEM-01A *Lemnion minoris* O. de Bolòs et Masclans 1955 – EUNIS C1.2, C1.3

Zajednice vodenih leća

Vegetation of free-floating duckweed vegetation of still and relatively nutrient-rich freshwater bodies of the temperate Europe

LEM-01B *Utricularion vulgaris* Passarge 1964 – EUNIS C1.2

Zajednice mješinki

Vegetation of free-floating bladderworts in mesotrophic and eutrophic waters of Europe

LEM-01C *Stratiotion* Den Hartog et Segal 1964 (syn. *Hydrocharition morsus-ranae* /Passarge 1964/ Westhoff et Den Held 1969) – EUNIS C1.2, C1.3

Zajednice resca

Vegetation of free-floating macrophytes in fairly nutrient-rich shallow waters of Europe

POT *Potamogetonetea* Klika in Klika et Novák 1941

Vegetacija ukorijenjenih plutajućih i submerznih makrofita

Vegetation of rooted floating or submerged macrophytes of stagnant mesotrophic, eutrophic and brackish freshwater bodies and slowly flowing shallow streams of Eurasia

POT-01 *Potamogetonetalia* Koch 1926

Zajednice s prevlašću mrijesnjava i biljaka s plutajućim listovima

Vegetation of rooted floating or submerged macrophytes of mesotrophic and eutrophic freshwater bodies of Eurasia

POT-01A *Potamogetonion* Libbert 1931 (syn. *Magnopotamion*/Vollmar 1947/ Den Hartog et Segal 1964) – EUNIS C1.2, C1.3, C2.3

Zajednice s prevlašću mrijesnjava

Vegetation of rooted and floating macrophytes of freshwater bodies at low and mid-altitudes of temperate Eurasia

POT-01B *Nymphaeion albae* Oberd. 1957 – EUNIS C1.2, C1.3, C2.3

Zajednice s prevlašću lopoča, lokvanja i biljaka s rozetama plutajućih listova

Vegetation of rooted floating-leaf macrophytes of sheltered nutrient-rich freshwaters of Western and Central Europe

POT-02 *Callitricho hamulatae-Ranunculetalia aquatilis* Passarge ex Theurillat in Theurillat et al. 2015 (syn. *Callitricho-Batrachietalia* Den Hartog et Segal ex Passarge 1978)

Zajednice s prevlašću vodenih žabnjaka i žabovlatki

Vegetation of crosswort, crowfoot and milfoil rooted macrophytes in shallow and intermittent freshwater streams of Europe

POT-02A *Batrachion fluitantis* Neuhäusl 1959 (syn. *Ranunculion fluitantis* Neuhäusl 1959) – EUNIS C2.2, C2.3

Zajednice s prevlašću vodenih žabnjaka u tekućim vodama

Vegetation of crowfoot and milfoil rooted macrophytes in shallow moving freshwaters of Europe

POT-02B *Ranunculion aquatilis* Passarge ex Theurillat in Theurillat et al. 2015 – EUNIS C1.2, C1.3,

C1.6, C2.3

Zajednice s prevlašću vodenih žabnjaka ili žabovlatki u sporotekućim i stajaćim vodama

Vegetation of crosswort rooted macrophytes in shallow stagnant freshwaters of temperate Europe

POT-03 *Zannichellietalia pedicellatae* Schaminée, Lanjouw et Schipper ex Mucina in Theurillat et al. 2015

Zajednice žabljaka u bočatim vodama

Vegetation of rooted macrophytes in meso-eutrophic brackish waters of Western and Central Europe

POT-03A *Zannichellion pedicellatae* Schaminée, Lanjouw et Schipper ex Passarge 1996 – EUNIS C1.5

Zajednice žabljaka u bočatim vodama

Vegetation of rooted macrophytes in meso-eutrophic brackish waters of Western and Central Europe

2.7. VEGETATION OF FRESHWATER SPRINGS, SHORELINES AND SWAMPS

Slatkovodna vegetacija izvorišta, obala i močvara

MON *Montio-Cardaminetea* Br.-Bl. et Tx. ex Klika et Hadač 1944

Vegetacija izvorišta i sedrenih barijera

Vegetation of water springs of Europe, the European Arctic archipelagos and Greenland

MON-01 *Cardamino-Chrysosplenietalia* Hinterlang 1992

Zajednice oko sjenovitih šumskih izvora meke vode

Vegetation of soft-water springs in shady forest habitats in the submontane and montane belts of the Central European mountains

MON-01A *Caricion remotae* Kästner 1941 – EUNIS C2.1

Zajednice oko sjenovitih šumskih izvora meke vode

Vegetation of soft-water springs in shady forest habitats in the submontane and montane belts of Central European mountains

MON-02 *Montio-Cardaminetalia* Pawłowski et al. 1928

Zajednice s prevlašću mahovina hladnih oligotrofnih izvorišta i sedrenih barijera

Vegetation of cold oligotrophic water-springs in the nemoral to arctic zones and in the oromediterranean belt of Europe

MON-02F *Cratoneurion commutati* Koch 1928 – EUNIS C2.1

Zajednice s prevlašću mahovina hladnih oligotrofnih izvorišta i sedrenih barijera u gorskom pojasu

Vegetation of moss-rich calcareous water springs in the montane and subalpine belts of Europe and Greenland

***MON-02G *Lycopodo europaei-Cratoneurion commutati* Hadač 1983 – EUNIS C2.1**

Zajednice s prevlašću mahovina hladnih oligotrofnih izvorišta i sedrenih barijera u brežuljkastom i brdskom pojasu

Vegetation of moss-rich calcareous water springs in the colline and submontane belts of Central Europe

Comment: Syntaxonomic position of that alliance is not clear and there are opinions that should be reduced to synonymy with the *Cratoneurion commutati* (Mucina et al. 2016). These moss-rich communities are very uniform in Croatia and probably belong to only one alliance. Here are two alliances listed until their syntaxonomy and presence in Croatia is not better investigated.

ISO *Isoëto-Nanojuncetea* Br.-Bl. et Tx. in Br.-Bl. et al. 1952
Pionirska vegetacija niskih šaševa periodično plavljenih staništa

Pioneer ephemeral dwarf-cyperaceous vegetation in periodically freshwater flooded habitats of Eurasia

ISO-02 *Nanocyperetalia* Klika 1935 (syn. *Cyperetalia fusci* Pietsch 1963)

Pionirske zajednice niskih šaševa periodično plavljenih staništa

Pioneer ephemeral herb- and graminoid-rich late-season vegetation on periodically flooded soils of temperate Europe

ISO-02A *Nanocyperion* Koch 1926 – EUNIS C3.5

Pionirske zajednice niskih šaševa periodično plavljenih staništa

Pioneer dwarf cyperaceous vegetation on moist calcium rich substrates of the submediterranean and Atlantic regions of Europe

ISO-02E *Verbenion supinae* Slavnić 1951 (syn. *Fimbristylion dichotomae* Horvatić 1954) – EUNIS C3.5

Pionirske zajednice niskih šaševa periodično plavljenih antropogenih staništa na tlima bogatima hranjivim tvarima

Pioneer ephemeral herb-rich vegetation in periodically flooded nutrient-rich habitats in the nemoral zone of Central and southeastern Europe

PHR *Phragmito-Magnocaricetea* Klika in Klika et Novák 1941

Tršćaci, rogozici i šašici

Reed swamp, sedge bed and herbland vegetation of freshwater or brackish water bodies and streams of Eurasia

PHR-01 *Phragmitetalia* Koch 1926

Tršćaci i rogozici

Reed swamps, sedge beds and herblands of mesotrophic and eutrophic stagnating or slowly flowing freshwater or brackish water bodies of Eurasia

PHR-01A *Phragmition communis* Koch 1926 – EUNIS C3.2, D5.1

Tršćaci i rogozici

Reed swamp vegetation of mesotrophic and eutrophic standing freshwater bodies or gently moving streams of boreo-temperate Eurasia

PHR-02 *Bolboschoenetalia maritimi* Hejný in Holub et al. 1967

Zajednica primorskog rančića

Meso-eutrophic brackish swamp reeds of European temperate coasts and the subcontinental inland regions of Central and Southern Europe

PHR-02A *Scirpion maritimi* Dahl et Hadač 1941 – EUNIS A2.5, C3.2

Zajednica primorskog rančića

Meso-eutrophic brackish swamp reeds of European temperate coastal regions

PHR-04 *Magnocaricetalia* Pignatti 1953

Šašici

Sedge-bed marsh vegetation of boreal and temperate Eurasia

PHR-04A *Magnocaricion elatae* Koch 1926 – EUNIS D5.2

Šašici na oligotrofnim do mezotrofnim sedimentima

Sedge-bed marsh vegetation on oligotrophic to mesotrophic organic sediments of temperate Europe

PHR-04B *Magnocaricion gracilis* Géhu 1961 – EUNIS D5.2

Šašici na eutrofnim sedimentima

Sedge-bed marsh vegetation on eutrophic clayey sediments in riverine habitats of temperate Europe

PHR-04C *Carici-Rumicion hydrolapathi* Passarge 1964 – EUNIS C3.1, C3.2

Šašici na muljevitim organskim sedimentima

Herbland vegetation on non-stabilized organic substrates in mesotrophic waters of boreal and temperate Eurasia

PHR-05 *Nasturtio-Glycerietalia* Pignatti 1953

Helofitske zajednice periodično plavljenih obala, stajaćica i plitkih vodotoka

Herblands and sedge-beds of well-oxygenated freshwater flowing streams of the temperate and mediterranean regions of Europe and Madeira

PHR-05A *Glycerio-Sparganion* Br.-Bl. et Sissingh in Boer 1942 – EUNIS C2.5, C3.1

Helofitske zajednice s prevlašću zeleni u stajaćicama i plitkim vodotocima

Herbland vegetation of small freshwater streams and in shallow water bodies of temperate Europe

PHR-05B *Phalaridion arundinaceae* Kopecký 1961 – EUNIS C3.2

Helofitske zajednice periodično plavljenih obala s prevlašću trstastog blještaca ili Buekovog šaša

Reed vegetation of freshwater flowing and seasonally fluctuating streams of temperate Europe

PHR-06 *Oenanthetalia aquaticae* Hejný ex Balátová-Tuláčková et al. 1993

Helofitske zajednice plitkih močvara promjenjivog vodostaja
Vegetation of emergent helophytes in shallow waters with fluctuating water table of temperate and boreal Eurasia

PHR-06A *Eleocharito palustris-Sagittarion sagittifoliae* Passarge 1964 – EUNIS C3.2

Helofitske zajednice plitkih močvara promjenjivog vodostaja

Vegetation of emergent helophytes on muddy soils of shallows streams and ponds with fluctuating water table of temperate and boreal Eurasia

2.8. VEGETATION OF BOGS AND FENS

Vegetacija cretova

SCH *Scheuchzerio palustris-Caricetea fuscae* Tx. 1937

Niski i prijelazni cretovi

Sedge-moss vegetation of fens, transitional mires and bog hollows in the temperate, boreal and Arctic zones of the Northern Hemisphere

SCH-01 *Caricetalia davallianae* Br.-Bl. 1950 *nom. conserv. propos.*

Bazofilni niski cretovi

Sedge-moss vegetation of calcareous and extremely mineral rich brown-moss fens of Eurasia

SCH-01A *Caricion davallianae* Klika 1934 – EUNIS D4.1

Bazofilni niski cretovi

Sedge-moss calcareous mineral-rich fen vegetation of Europe and Western Asia

SCH-02 *Sphagno warnstorffii-Tomentypnetalia* Lapshina 2010

Neutrofilni cretovi

Sedge and brown-moss nitrogen-limited fen vegetation of Western Siberia and the northeastern European lowlands

SCH-02A *Sphagno warnstorffii-Tomentypnion niten-tis* Dahl 1957 – EUNIS D4.1

Neutrofilni cretovi

Moderately calcium-rich sedge-moss fens of the boreal zone and mountainous regions in the nemoral zone of Europe

SCH-03 *Caricetalia fuscae* Koch 1926

Acidofilni prijelazni cretovi

Sedge-moss vegetation of slightly to strongly acidic minerotrophic moderately-rich or poor fens in the boreal and temperate zones of the Northern Hemisphere and in the supramediterranean belt of Southern European mountains

SCH-03B *Caricion fuscae* Koch 1926 *nom. conserv. propos.* – EUNIS D2.2

Umjereno acidofilni cretovi sa smeđim mahovinama

Sedge-moss vegetation moderately to low calcium-rich slightly acidic fens dominated by calcifuge brown-mosses or nutrient-demanding peat-mosses of Europe

SCH-03D *Sphagno-Caricion canescentis* Passarge (1964) 1978 *nom. conserv. propos.* – EUNIS D2.2

Acidofilni cretovi s mahovima tresetarima

Peat-moss acidic poor yet minerotrophic fens of the boreal and temperate zones of the Northern Hemisphere

OXY *Oxycocco-Sphagnetea* Br.-Bl. et Tx. ex Westhoff et al. 1946

Visoki cretovi

Dwarf-shrub, sedge and peat-moss vegetation of the Holarctic ombrotrophic bogs and wet heath on extremely acidic soils

OXY-02 *Sphagnetalia medii* Kästner et Flössner 1933

Visoki cretovi

Dwarf-shrub and peat-moss vegetation of the continental, subcontinental, boreo-continental and high-altitude raised bogs of the Northern Hemisphere

OXY-02B *Sphagnion medii* Kästner et Flössner 1933 – EUNIS D1.1

Visoki cretovi

Dwarf-shrub and peat-moss vegetation of the subcontinental, temperate and mountain raised bogs of Eurasia

3. ANTHROPOGENIC VEGETATION

Antropogena vegetacija

PAR *Papaveretea rhoeadis* S. Brullo et al. 2001 *nom. conserv. propos.*

Kontinentalna acidofilna jednogodišnja korovna vegetacija

Annual weed segetal vegetation of arable crops, gardens and vineyards in the cool-temperate and boreal zones of Eurasia

PAR-01 *Aperetalia spicae-venti* J.Tx. et Tx. in Malato-Beliz et al. 1960 *nom. conserv. propos.* (syn. *Chenopodietalia albi* /Tx. 1937/ Tx. et Lohmeyer in Tx. 1950; *Atriplici-Chenopodietalia albi* /Tx. 1937/ Nordhagen 1940 *nom. ambig. rejic. propos.*)

Kontinentalne acidofilne zajednice jednogodišnjih korova

Weed vegetation of cereal fields and gardens on acidic and nutrient-poor soils in the cool-temperate and boreal zones of Eurasia

PAR-01A *Scleranthion annui* (Kruseman et Vlieger 1939) Sissingh in Westhoff et al. 1946 – EUNIS I1.1, I1.2, I1.3

Kontinentalne acidofilne zajednice jednogodišnjih korova u usjevima ozimih žitarica

Weed segetal vegetation of winter cereal crops on neutral to acidic loamy and sandy-loamy soils of the (sub)atlantic regions in the nemoral zone of Europe

PAR-01B *Oxalidion europeae* Passarge 1978 (syn. *Spergulo-Oxalidion* Görs in Oberd. et al. 1967) – EUNIS I1.1, I1.2, I1.3

Kontinentalne acidofilne zajednice jednogodišnjih korova u okopavinskim kulturama

Weed segetal vegetation of gardens and root crop fields on acidic loamy and sandy-loamy soils of the subatlantic to subcontinental regions in the nemoral zone of Europe

PAR-02 *Papaveretalia rhoeadis* Hüppe et Hofmeister ex Theurillat et al. 1995 nom. conserv. propos.

Kontinentalna bazofilna jednogodišnja korovna vegetacija

Weed segetal vegetation of arable crops on base-rich soils in the forest, forest-steppe, steppe and subboreal zones of Europe

PAR-02A *Caucalidion* Tx. ex von Rochow 1951 – EUNIS I1.1, I1.3

Kontinentalna bazofilna jednogodišnja korovna vegetacija u usjevima žitarica

Weed segetal vegetation of cereal crops on the base-rich soils of Western, Central and southeastern Europe

PAR-02C *Veronico-Euphorbion* Sissingh in Passarge 1964 – EUNIS I1.1, I1.3

Kontinentalna bazofilna jednogodišnja korovna vegetacija u okopavinskim kulturama

Weed segetal vegetation of vineyards and gardens on the base-rich soils of Central and Western Europe

SIS *Sisymbrietea* Gutte et Hilbig 1975

Kontinentalna jednogodišnja ruderalna vegetacija

Zoo-anthropogenic and modern anthropogenic vegetation of animal shelters and disturbed ruderal sites in cool- and cold-temperate regions of Eurasia

SIS-01 *Sisymbrietalia sophiae* J. Tx. ex Görs 1966 nom. conserv. propos. (syn. *Sisymbrietalia officinalis* J.Tx. in Lohmeyer et al. 1962)

Kontinentalne jednogodišnje ruderalne zajednice

Ruderal vegetation of annual nutrient-demanding herbs and grasses on disturbed soils in the nemoral and steppe zones of Europe

SIS-01C *Malvion neglectae* (Gutte 1972) Hejny 1978 – EUNIS E5.1

Kontinentalne jednogodišnje ruderalne zajednice koje se razvijaju ljeti

Ruderal vegetation of low-grown short-lived summer-annual herbs on nutrient-rich loamy and slightly trampled soils of temperate Europe

SIS-01D *Sisymbriion officinalis* Tx. et al. ex von Rochow 1951 – EUNIS E5.1

Kontinentalne jednogodišnje ruderalne zajednice koje se razvijaju u proljeće

Ruderal vegetation of nutrient-demanding short-lived winter-annual grasses on sandy anthropogenic soils of temperate Europe

CHE *Chenopodietea* Br.-Bl. in Br.-Bl. et al. 1952

Sredozemna jednogodišnja ruderalna vegetacija

Winter-annual weed segetal and ruderal vegetation of man-made habitats of the Mediterranean, the mild-winter Atlantic seaboard and Macaronesia

CHE-01 *Brometalia rubenti-tectori* (Rivas Goday et Rivas-Mart. 1973) Rivas-Mart. et Izco 1977 nom. conserv. propos.

Sredozemne ruderalne zajednice s prevlašću jednogodišnjih trava

Winter-annual ruderal vegetation of summer-dry man-made habitats of the Mediterranean, the mild-winter Atlantic seaboard and Macaronesia

CHE-01F *Hordeion murini* Br.-Bl. in Br.-Bl. et al. 1936 – EUNIS E5.1

Sredozemne ruderalne zajednice s prevlašću jednogodišnjih trava

Mediterranean ruderal winter-annual grasslands

CHE-02 *Chenopodietalia* Br.-Bl. in Br.-Bl. et al. 1936

Sredozemne ruderalne zajednice s prevlašću jednogodišnjih zeleni

Winter-annual ruderal herb-rich vegetation on nutrient-rich disturbed soils of the Mediterranean and the Macaronesia

CHE-02A *Chenopodion muralis* Br.-Bl. in Br.-Bl. et al. 1936 (syn. *Malvion parviflorae* (Rivas-Mart. 1978) S. Brullo in S. Brullo et Marcenò 1985) – EUNIS E5.1

Sredozemne ruderalne zajednice s prevlašću jednogodišnjih zeleni

Mediterranean nutrient-demanding ruderal vegetation dominated by low-grown non-succulent herbs

CHE-03 *Geranio purpureae-Cardaminetalia hirsutae* S. Brullo in S. Brullo et Marcenò 1985

Sredozemne ruderalne zajednice šumskih rubova s prevlašću jednogodišnjih zeleni

Winter-annual fringe vegetation in shaded mesic habitats of the Mediterranean, winter-mild temperate (sub)atlantic and submediterranean regions of temperate Europe and the Macaronesia

***CHE-03G *Cardaminion graecae* Biondi, Pinzi et Gubellini in Biondi et al. 2013** – EUNIS E5.1

Sredozemne ruderalne zajednice šumskih rubova s prevlašću jednogodišnjih zeleni Apeninskog poluotoka

Mesic nitrophilous winter-annual fringe vegetation of the Apennines

***CHE-03H *Euphorbio taurinensis-Geranion lucidi* Matevski et Čarni in Mucina et al. 2009** – EUNIS E5.1

Sredozemne ruderalne zajednice šumskih rubova s prevlašću jednogodišnjih zeleni Balkanskog poluotoka

Mesic nitrophilous winter-annual fringe vegetation of the submediterranean regions of the Balkan Peninsula

DIG *Digitario sanguinalis-Eragrostietea minoris* Mucina, Lososová et Šilc in Mucina et al. 2016

Termofilna antropogena vegetacija na ljeti suhim, pješčanim staništima

Thermophilous grass-rich anthropogenic vegetation rich in summer-annual C4 species in the southern nemoral, mediterranean, steppe and semi-desert zones of Europe

DIG-01 *Eragrostietalia* J. Tx. ex Poli 1966

Termofilne antropogene zajednice na ljeti suhim, pješčanim staništima

Thermophilous grass-rich anthropogenous vegetation rich in C4 species on summer-dry sandy soils of Southern and Central Europe

DIG-01A *Spergulo arvensis-Erodion cicutariae* J.Tx. in Passarge 1964 (syn. *Panico-Setarion* Sissingh in Westhoff et al. 1946) – EUNIS I1.1, I1.2, I1.3, I1.5

Kontinentalne termofilne korovne zajednice ranog ljeta na pješčanim staništima

Subthermophilous summer-annual weed vegetation on sandy and sandy-loamy soils of the atlantic to subcontinental regions in the nemoral zone of Europe

DIG-01B *Eragrostion Tx. in Oberd. 1954* – EUNIS E5.1, H5.6, I1.1, I1.3

Kontinentalne termofilne korovne zajednice kasnog ljeta na pješčanim staništima

Thermophilous late-summer weed vegetation on sandy soils of southeastern Central Europe and the Balkan Peninsula

DIG-01D *Diplotaxidion eruroidis Br.-Bl. in Br.-Bl. et al. 1936* (syn. *Calendulo arvensis-Heliotropion europaei* Trinajstić 2008) – EUNIS E5.1

Sredozemne zajednice okopavinskih korova

Weed vegetation on neutral to basic soils in the thermo- and mesomediterranean belts of the Central and Western Mediterranean

DIG-01F *Salsolion ruthenicae Philippi ex Oberd. 1983* – EUNIS E5.1

Kontinentalne termofilne ruderalne zajednice na pješčanim i šljunčanim staništima

Ruderal vegetation on disturbed gravelly and sandy soils of the subcontinental regions of Central Europe

DIG-02 *Euphorbietalia prostratae Vicedo et al. 1997*

Termofilne zajednice utrina na ljeti suhim, pješčanim staništima

Summer-dry trampled vegetation on sandy soils in the southern nemoral and mediterranean zones of Europe

DIG-02B *Polycarpo-Eleusinion indicae Čarni et Mucina 1998* – EUNIS E1.E, H5.6

Sredozemne termofilne zajednice utrina na pješčanim staništima

Summer-dry vegetation of sandy trampled habitats of Northern Italy and the Illyrian region

DIG-02C *Eragrostio-Polygonion arenastri Couderc et Izco ex Čarni et Mucina 1998* – EUNIS E1.E, H5.6

Kontinentalne termofilne zajednice utrina na pješčanim staništima

Summer-dry trampled vegetation on sandy soils of Western and Central Europe

POL *Polygono-Poetea annuae Rivas-Mart. 1975*

Vegetacija utrina s prevlašću jednogodišnjih biljaka

Subcosmopolitan therophyte-rich dwarf-herb vegetation of trampled habitats

POL-01 *Polygono arenastri-Poetalia annuae Tx. in Géhu et al. 1972 corr. Rivas-Mart. et al. 1991*

Zajednice utrina s prevlašću jednogodišnjih biljaka

Subcosmopolitan therophyte-rich dwarf-herb vegetation of trampled habitats

POL-01A *Polygono-Coronopodium Sissingh 1969*

(syn. *Polygonion avicularis* Br.-Bl. 1931; *Matricario matricarioidis-Polygonion arenastri* Rivas-Mart. 1975 corr. Rivas-Mart. et al. 1991) – EUNIS E1.E, H5.6

Kontinentalne nitrofilne zajednice utrina

Herb-rich vegetation in trampled habitats in the temperate to boreal zones of Europe

POL-01B *Polycarpion tetraphylli Rivas-Mart. 1975* – EUNIS E1.E, H5.6

Sredozemne zajednice utrina

Herb-rich vegetation in trampled sunny habitats of the Mediterranean

POL-01C *Saginion procumbentis Tx. et Ohba in Géhu et al. 1972* – EUNIS E2.8, H5.6

Kontinentalne zajednice zasjenjenih, intenzivno gaženih utrina

Herb-rich vegetation in strongly trampled shady habitats of Europe

ART *Artemisietea vulgaris Lohmeyer et al. in Tx. ex von Rochow 1951*

Ruderalna vegetacija visokih zeleni na suhim staništima

Perennial (sub)xerophilous ruderal vegetation of the temperate and submediterranean regions of Europe

ART-01 *Onopordetalia acanthii Br.-Bl. et Tx. ex Klika et Hadač 1944*

Kontinentalne ruderalne zajednice s prevlašću kratkoživućih trajnica na suhim staništima

Subxeric ruderal vegetation dominated by short-lived perennials of temperate Europe

ART-01A *Onopordion acanthii Br.-Bl. et al. 1936* – EUNIS E5.1

Ruderalne zajednice na suhim staništima istočnih kontinentalnih područja

Thistle-dominated xero-mesophytic ruderal vegetation of subcontinental Central Europe and the Northern Balkans

ART-01B *Dauco-Melilotion Görs ex Rostański et Gutte 1971* – EUNIS E5.1, I1.5

Ruderalne zajednice na suhim staništima zapadnih kontinentalnih područja

Xero-mesophytic ruderal vegetation dominated by biennial plants of temperate and subboreal Europe

ART-03 *Agropyretalia intermedio-repentis T. Müller et Görs 1969*

Kontinentalne korovne i ruderalne zajednice na zapuštenim površinama

Semiruderal grasslands and herblands and weed segetal vegetation of perennial crops in the nemoral, forest-steppe and subboreal zones of Europe

ART-03A *Convolvulo arvensis-Agropyron repentis Görs 1967* – EUNIS E5.1

Kontinentalne korovne i ruderalne zajednice na zapuštenim površinama

Semiruderal grasslands and herblands in the nemoral and subboreal zones of Europe

ART-04 *Carthametalia lanati S. Brullo in S. Brullo et Marcenò 1985*

Sredozemne ruderalne zajednice s prevlašću visokih glavočika

Thistle-dominated ruderal vegetation on disturbed calcareous substrates of the submediterranean regions of Southern Europe

ART-04A *Silybo mariani-Urticion piluliferae Sissingh ex Br.-Bl. et O. de Bolòs 1958* – EUNIS E5.1

Primorske ruderalne zajednice s prevlašću visokih glavočika

Thistle-dominated ruderal vegetation of the Central Mediterranean

ART-04C *Onopordion illyrici Oberd. 1954* – EUNIS E5.1

Submediteranske ruderalne zajednice s prevlašću visokih glavočika

Thistle-dominated ruderal vegetation of the submediterranean regions of the Balkans

ART-05 *Elytrigio repentis-Dittrichietalia viscosae* Mucina ined.

Sredozemne ruderalne zajednice na zapuštenim površinama

Anthropogenic sub-ruderal and ruderal grasslands and herblands of submediterranean and mediterranean Southern Europe

ART-05A *Inulo viscosae-Agropyrion repentis* Biondi et Allegrezza 1996 – EUNIS E5.1

Sredozemne ruderalne zajednice na zapuštenim površinama

Anthropogenic sub-ruderal and ruderal grasslands and herblands of the submediterranean regions of the Apennine and Balkan Peninsulas

EPI *Epilobietea angustifolii* Tx. et Preising ex von Rochow 1951 (syn. *Galio-Urticetea* Passarge ex Kopecký 1969)

Mezofilna poluprirodna vegetacija visokih zeleni

Tall-herb semi-natural perennial vegetation on disturbed forest edges, nutrient-rich riparian fringes and in forest clearings in the temperate and boreal zones of Eurasia

EPI-01 *Galeopsio-Senecionetalia sylvatici* Passarge 1981 nom. conserv. propos.

Acidofilne poluprirodne zajednice visokih zeleni na šumskim rubovima i čistinama

Tall-herb perennial semi-natural vegetation on acidic soils on forest margins and clearings of the Eurosiberian Region

EPI-01A *Epilobion angustifolii* Oberd. 1957 – EUNIS E5.3, G5.8

Acidofilne poluprirodne zajednice visokih zeleni na šumskim rubovima i čistinama

Tall-herb perennial semi-natural vegetation on acidic soils of forest margins and in forest clearings in the boreal and nemoral zones of Europe

EPI-02 *Circaeo lutetianae-Stachyetalia sylvaticae* Passarge 1967 nom. conserv. propos. (*Lamio albi-Chenopodietalia boni-henrici* Kopecký 1969)

Poluprirodne zajednice zeleni na šumskim rubovima i čistinama

Ruderal and semi-natural fringe mesic tall-herb vegetation of tall-herbs on nutrient- and base-rich soils of cool-temperate and submediterranean Europe

EPI-02A *Fragarion vescae* Tx. ex von Rochow 1951 nom. conserv. propos. (syn. *Atropion* Br.-Bl. ex Br.-Bl. et al. 1952) – EUNIS G5.8

Poluprirodne zajednice zeleni početnih sukcesijskih stadija na šumskim čistinama

Semi-ruderal herb-rich clearing vegetation on nutrient-rich calcareous soils in the nemoral zone of Central and Western Europe

EPI-02B *Impatienti noli-tangere-Stachyon sylvaticae* Görs ex Mucina 1993 – EUNIS E5.4

Poluprirodne zajednice visokih zeleni na zasjenjenim šumskim rubovima i čistinama

Semi-ruderal tall-herb vegetation of shaded mesic forest margins and clearings on loamy soils in the colline and submontane belts of Central Europe

EPI-02C *Aegopodion podagrariae* Tx. 1967 nom. conserv. propos. – EUNIS E5.1, E5.4

Poluprirodne nitrofilne zajednice zeleni na zasjenjenim šumskim rubovima i čistinama

Semi-ruderal herb-rich clearing vegetation on mesic margins and clearings of forests and scrub in the temperate and subboreal zones of Europe

EPI-03 *Arctio lappae-Artemisietalia vulgaris* Dengler 2002
Ruderalne zajednice visokih zeleni na šumskim rubovima i čistinama

Ruderal vegetation dominated by short-lived perennials on mesic loamy soils of the low-altitude cool-temperate Central Europe and at high-altitudes of submediterranean Europe

EPI-03A *Arction lappae* Tx. 1937 – EUNIS E5.1

Ruderalne zajednice visokih zeleni na šumskim rubovima i čistinama zapadnih kontinentalnih područja

Ruderal vegetation of short-lived perennials on mesic loamy soils of cool-temperate Europe

EPI-03B *Balloto-Conion maculati* S. Brullo et Marcenò 1985 – EUNIS E5.1

Ruderalne zajednice visokih zeleni na antropogenim staništima istočnih kontinentalnih područja

Tall-herb perennial ruderal vegetation in mesic habitats in the submontane and montane belts of submediterranean Europe

EPI-04 *Galio-Alliarietalia* Oberd. in Görs et T. Müller 1969

Nitrofilne termofilne ruderalne zajednice zeleni na šumskim rubovima i čistinama

Ruderal and semi-natural thermophilous fringe vegetation of short-lived herbs on nutrient-rich soils in the submontane and montane belts of submediterranean Europe

EPI-04A *Geo urbani-Alliarion officinalis* Lohmeyer et Oberd. in Görs et T. Müller 1969 (syn. *Galio-Alliarion* Lohmeyer et Oberd. in Oberd. et al. 1967) – EUNIS E5.1

Nitrofilne termofilne ruderalne zajednice zeleni na šumskim rubovima i čistinama

Ruderal and semi-natural fringe thermophilous vegetation of short-lived low herbs on nutrient-rich soils of temperate Europe

EPI-05 *Convolvuletalia sepium* Tx. ex Moor 1958

Poluprirodne zajednice visokih zeleni na vlažnim staništima i uz obale vodotoka

Semi-natural fringe vegetation on banks of rivers and other water bodies of temperate Europe and the Mediterranean

EPI-05A *Senecionion fluviatilis* Tx. ex Moor 1958 (syn. *Convolvulion sepium* Oberd. 1949) – EUNIS E5.4

Poluprirodne zajednice visokih zeleni na vlažnim staništima i uz obale vodotoka

Tall-herb fringe vegetation on nutrient-rich river banks and in ditches of Central Europe

BID *Bidentetia* Tx. et al. ex von Rochow 1951

Pionirska vegetacija vlažnih eutrofnih staništa

Summer-annual pioneer vegetation of seasonally flooded nutrient-rich river alluvia, lacustrine banks and heavily nutrient-loaded anthropogenic habitats of boreo-temperate Europe and North Africa

BID-01 *Bidentetalia* Br.-Bl. et Tx. ex Klika et Hadač 1944

Pionirske zajednice vlažnih eutrofnih staništa

Summer-annual pioneer vegetation of seasonally flooded nutrient-rich river alluvia, lacustrine banks and heavily nutrient-loaded anthropogenic habitats of boreo-temperate Europe

BID-01A *Bidention tripartitae* Nordhagen ex Klika et Hadač 1944 – EUNIS C3.5

Pionirske zajednice vlažnih eutrofnih staništa

Summer-annual pioneer vegetation of periodically nutrient-rich river banks and drained muddy bottoms of eutrophic lakes of boreo-temperate Europe

References

- Biondi, E., Blasi, C., Allegranza, M., Anzellotti, I., Azzella, M. M., Carli, E., Casavecchia, S., Copiz, R., Del Vico, E., Facioni, L., Galdenzi, D., Gasparri, R., Lasen, C., Pesaresi, S., Poldini, L., Sburlino, G., Taffetani, F., Vagge, I., Zitti, S., Zivkovic, L., 2014: Plant communities of Italy: the vegetation prodrome, *Plant Biosystems* 148, 728–814.
- Borhidi, A., Kevey, B., Lendvai, G., 2012: Plant communities of Hungary. *Akadémiai Kiadó, Budapest*.
- Brullo, S., Giusso del Galdo, G., Guarino, R., 2001: The orophilous communities of the *Pino-Juniperetea* class in the Central and Eastern Mediterranean area. *Feddes Repertorium*, 112, 261–308.
- Čarni, A., Franjić, J., Šilc, U., Škvorc, Ž., 2005: Floristical, ecological and Structural diversity of vegetation of forest fringes of the northern Croatia along a climatic gradient. *Phyton (Horn, Austria)* 45, 287–303.
- Čarni, A., Franjić, J., Škvorc, Ž., 2002: The mantle vegetation in Slavonia (Croatia). *Šumarski list* 126, 1–10 (in Croatian).
- Čarni, A., Košir, P., Karadžić, B., Matevski, V., Redžić, S., Škvorc, Ž., 2009: Thermophilous deciduous forests in Southeastern Europe. *Plant Biosystems* 143, 1–13.
- Čarni, A., Mucina, L., 2015: Validations and typifications of some South European syntaxa. *Hacquetia* 14, 289–299.
- Dítě, D., Melečková, Z., Šuvada, R., Piš, V., Eliáš jun. P., 2015: The phytosociology and ecology of saline vegetation with *Scorzonera parviflora* in the Pannonian-Western Balkan gradient. *Phytocenologia* 45, 33–47.
- Franjić, J., Škvorc, Ž., Filipović, K., Vitasović-Kosić, I., 2005: Phytosociological characteristics of *Quercus cerris* L. forests in East Slavonia (Croatia). *Hacquetia* 4, 27–35.
- Horvat, I., 1962: Vegetation of the mountains of Western Croatia. *Prirodoslovna Istraživanja Jugoslavenske akademije* 30. *Acta Biologica* 2, 1–179 (in Croatian).
- Horvat, I., Glavač, V., Ellenberg, H., 1974: Vegetation Sudosteuropas. *Geobotanica selecta* 4. Gustav Fischer Verlag, Stuttgart.
- Hulina, N., 2002: Contribution to the knowledge of segetal vegetation of Croatia. *Hacquetia* 1, 205–208.
- Jasprica, N., 2016: *Tamaricion dalmaticae*, a new alliance from the eastern Adriatic. *Hacquetia* 15, 27–29.
- Jasprica, N., Bogdanović, S., Dolina, K., Ruščić, M., Pandža, M., Kovačić, S., 2016: Syntaxonomy of *Arundo* stands along the eastern Adriatic coast. *Plant Biosystems* 150, 887–903.
- Jasprica, N., Dolina, K., Milović, M., 2015: Plant taxa and communities on three islets in south Croatia, NE Mediterranean. *Natura Croatica* 24, 191–213.
- Jasprica, N., Kovačić, S., 2011: The diversity of vegetation on the Pelješac peninsula. Lupis, B. V. (ed.), *Zbornik radova u čast Ivce Žile, Matica hrvatska – ogranak Dubrovnik*, 263–282 (in Croatian).
- Jasprica, N., Milović, M., Pandža, M., 2016: The formalised definition of the *Picrido hieracioidis-Cirsietum candelabri* association. *Natura Croatica* 25, 331–332.
- Jasprica, N., Milović, M., Romić, M., 2015: Phytosociology and ecology of *Cressa cretica* L. (Convolvulaceae) on the eastern Adriatic coast. *Hacquetia* 14, 265–276.
- Jasprica, N., Milović, M., 2016: The vegetation of the islet of Badija (south Croatia), with some notes on its flora. *Natura Croatica* 25, 1–24.
- Jasprica, N., Milović, M., Kovačić, S., Stamenković, V. 2016: Phytocoenotic diversity of the NE-Adriatic island of Olib. *Plant Sociology* 53, 55–81.
- Jasprica, N., Milović, M., Pandža, M., 2015: *Picrido hieracioidis-Cirsietum candelabri* Jasprica et al. 2015 – a ruderal association new to Croatia. *Glasnik Hrvatskog botaničkog društva* 3, 4–14.
- Jasprica, N., Škvorc, Ž., Dolina, K., Ruščić, M., Kovačić, S., Franjić, J., 2016: Composition and ecology of the *Quercus coccifera* L. communities along the eastern Adriatic coast (NE Mediterranean). *Plant Biosystems* 150, 1140–1155.
- Košir, P., Čarni, A., Di Pietro, R., 2008: Classification and phytogeographical differentiation of broad-leaved ravine forests in south-eastern Europe. *Journal of Vegetation Science* 19, 331–342.
- Košir, P., Casavecchia, S., Čarni, A., Škvorc, Ž., Zivkovic, L., Biondi, E., 2013: Ecological and phytogeographical differentiation of oak-hornbeam forests in southeastern Europe. *Plant Biosystems* 147, 84–98.
- Krstonošić, D., 2013: The vegetation succession on the mesophilic and xerophilic grasslands of the Slavonian Mountains. *Doktorska disertacija. Šumarski fakultet, Sveučilište u Zagrebu* (in Croatian).
- Mucina, L., Bültmann, H., Dierßen, K., Theurillat, J.-P., Dengler, J., Čarni, A., Šumberová, K., Raus, T., Di Pietro, R., Gavilán García, R., Chytrý, M., Iakushenko, D., Schaminée, J.H.J., Bergmeier, E., Santos Guerra, A., Daniëls, F.J.A., Ermakov, N., Valachovic, M., Pignatti, S., Rodwell, J.S., Pallas, J., Capelo, J., Weber, H.E., Lysenko, T., Solomesh, A., Dimopoulos, P., Aguiar, C., Freitag, H., Hennekens, S.M., Tichý, L., 2016: Vegetation of Europe: Hierarchical floristic classification system of plant, lichen, and algal communities. *Applied Vegetation Science* 19, 3–264.
- Nikolić, T., (ed.) 2017: Flora Croatica database. Botanički zavod, Prirodoslovno-matematički fakultet, Sveučilište u Zagrebu. Retrieved from <http://hirc.botanic.hr/fcd>.
- Pandža, M., Franjić, J., Škvorc, Ž., 2005: Weed and ruderal vegetation (*Stellarietea mediae* R. Tx. et al. ex von Rochow 1951) in the central part of the East Adriatic coast. *Periodicum Biologorum* 107, 361–372.
- Pandža, M., Franjić, J., Škvorc, Ž., 2007: The salt marsh vegetation on the East Adriatic coast. *Biologia, Bratislava* 62, 24–31.
- Pandža, M., Franjić, J., Škvorc, Ž., Idžojtić, M., 2007: Syntaxonomical and synchorological analysis of the *Crithmo-Limonietaea* Br.-Bl. 1947 on the Eastern Adriatic coast. *Periodicum Biologorum* 109, 61–66.
- Poldini, L., 1989: La vegetazione del Carso Isontino e Triestino. Ed. Lint, Trieste.
- Purger, D., Lengyel, A., Kevey, B., Lendvai, G., Horváth, A., Tomi, Z., Csiky, J., 2014: Numerical classification of oak forests on loess in Hungary, Croatia and Serbia. *Preslia* 87, 47–66.
- Schaminée, J.H.J., Chytrý, M., Hennekens, S.M., Mucina, L., Rodwell, J.S., Tichý, L. 2012: Development of vegetation syntaxa crosswalks to EUNIS habitat classification and related data sets. Wageningen: Alterra (EEA Report EEA/NSV/12/001).
- Sedlar, Z., Hršak, V., Šoštarić, R., 2011: Numerical and phytosociological analysis of the *Junipero sibiricae – Pinetum dalmaticae* Domac (1956) 1965 association and comparison to mediterranean forests dominated by *Pinus nigra* Arn. s.l. *Šumarski list* 135, 139–152.
- Šilc, U., Ačić, S., Škvorc, Ž., Krstonošić, D., Franjić, J., Dajić Stevanović, Z., 2014: Grassland vegetation of the *Molinio-Arrhenatheretea* class in the NW Balkan Peninsula. *Applied Vegetation Science* 17, 591–603.
- Šilc, U., Čarni, A., 2012: Conspectus of vegetation syntaxa in Slovenia. *Hacquetia* 11, 113–164.

- Stančić, Z., 2007: Marshland vegetation of the class *Phagmito-Magnocaricetea* in Croatia. *Biologia*, Bratislava 62, 297–314.
- Stupar, V., Brujić, J., Škvorc, Ž., Čarni, A. 2016: Vegetation types of thermophilous deciduous forests (*Quercetea pubescentis*) in the Western Balkans. *Phytocoenologia* 46, 49–68.
- Šugar, I., Plazibat, M., 1988: Vegetation of upper Pounje – Plant-geographic position and division. *Zbornik referata naučnog skupa „Minerali, stijene, izumrli i živi svijet BiH”*, 387–397. Sarajevo (in Croatian).
- Surina, B., 2013: Heaths with dwarf ericaceous shrubs and Alpine juniper (*Juniperus alpina*) in the Dinaric Alps: A nomenclatorial and synsystematic re-appraisal. *Acta Botanica Croatica* 72, 113–132.
- Terzi, M., 2015: Numerical analysis of the order *Scorzoneretalia villosae*. *Phytocoenologia* 45, 11–32.
- Terzi, M., Di Pietro, R., 2016: Nomenclatural remarks on the chasmophytic vegetation of the *Centaureo-Campanuletalia*. *Plant Biosystems* 150, 1364–1369.
- Topić, J., 1984: Phytocenological and phytogeographical characteristics of the hoe weed vegetation in the continental part of Croatia. *Acta Botanica Croatica* 43, 273–284.
- Topić, J., Vukelić, J., 2009: Manual for the determination of terrestrial habitats in Croatia. Državni zavod za zaštitu prirode RH, Zagreb.
- Trinajstić, I., 2002: Vegetation overview of Biokovo area. *Ekološke monografije, Biokovo* 2, 13–37 (in Croatian).
- Trinajstić, I., 2008: Plant communities of Croatia. *Akademija šumarskih znanosti, Zagreb* (in Croatian).
- Vukelić, J., 2012: Forest vegetation of Croatia. Šumarski fakultet Sveučilišta u Zagrebu, Državni zavod za zaštitu prirode, Zagreb (in Croatian).
- Vukelić, J., Mikac, S., Baričević, D., Bakšić, D., Rosavec, R., 2008: Forest Sites and Forest Communities in Croatia National Ecological Network. Državni zavod za zaštitu prirode RH, Zagreb (in Croatian).
- Willner, W., Grabherr, G., (eds.) 2007: *Die Wälder und Gebüsche Österreichs*. 2 vols.: Spektrum Elsevier, München.
- Willner, W., Solomeshch, A., Čarni, A., Bergmeier, E., Ermakov, N., Mucina, L., 2016: Description and validation of some European forest syntaxa – a supplement to the EuroVegChecklist. *Hacquetia* 15, 15–25.
- Willner, W., Kuzemko, A., Dengler, J., Chytrý, M., Bauer, N., Becker, T., Bitá-Nicolae, C., Botta-Dukát, Z., Čarni, A., Csiky, J., Igić, R., Kački, Z., Korotchenko, I., Kropf, M., Krstivojević, M., Krstonošić, D., Rédei, T., Ruprecht, E., Schrott-Ehrendorfer, L., Semenishchenkov, Y., Stančić, Z., Vashenyak, Y., Vynokurov, D., Janišová, M., 2017: A higher-level classification of the Pannonian and western Pontic steppe grasslands (Central and Eastern Europe). *Applied Vegetation Science* 20, 143–158.
- Willner, W., Jiménez-Alfaro, B., Agrillo, E., Biurrun, I., Campos, J. A., Čarni, A., Casella, L., Csiky, J., Čušterevska, R., Didukh, Y. P., Ewald, J., Jandt, U., Jansen, F., Kački, Z., Kavgaci, A., Lenoir, J., Marinšek, A., Onyshchenko, V., Rodwell, J., Schaminée, J., Šibík, J., Škvorc, Ž., Svenning, J.-C., Tsiropidis, I., Turtureanu, P. D., Tzonev, R., Vassilev, K., Venzoni, R., Wohlgemuth, T., Chytrý, M., 2017: Classification of European beech forests: a Gordian Knot? *Applied Vegetation Science* 20, 494–512.